



**SRM**  
UNIVERSITY  
(Under section 3 of UGC Act 1956)

**BACHELOR OF MEDICINE AND BACHELOR OF SURGERY (MBBS)  
CURRICULUM AND SYLLABUS  
FOR STUDENTS ADMITTED FROM 2015 – 2016 ONWARDS**



**2015 REGULATIONS**

**FACULTY OF MEDICINE  
SRM MEDICAL COLLEGE HOSPITAL AND RESEARCH CENTRE  
SRM UNIVERSITY  
SRM NAGAR, KATTANKULATHUR  
KANCHEEPURAM DISTRICT – 603203**

*Knowledge grows exponentially,  
The more we know, the greater our ability to learn, and the faster  
We expand our knowledge base.*

**- Dan Brown**

**SRM MEDICAL COLLEGE  
HOSPITAL AND RESEARCH CENTRE CURRICULUM  
AND SYLLABUS FOR MBBS COURSE**

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**MBBS COURSE DETAILS IN SRM UNIVERSITY**  
**(As per MCI norms)**

**ADMISSION, SELECTION & TRAINING:-**

Admission to the Medical Course - Eligibility Criteria: No Candidate shall be allowed to be admitted to the Medical Curriculum proper of first Bachelor of Medicine and Bachelor of Surgery (MBBS) Course until:

(1) He/she shall complete the age of 17 years on or before 31<sup>st</sup> December of the year of admission to the MBBS Course.

4(2) *He/She has passed qualifying examination as under:-*

(a) *The higher secondary examination or the Indian School Certificate Examination which is equivalent to 10+2 Higher Secondary Examination after a period of 12 years study, the last two years of study comprising of Physics, Chemistry, Biology/Bio-technology and Mathematics or any other elective subjects with English at a level not less than core course of English as prescribed by the National Council of Educational Research and Training after the introduction of the 10+2+3 years educational structure as recommended by the National Committee on education;*

*Note: Where the course content is not as prescribed for 10+2 education structure of the National Committee, the candidates will have to undergo a period of one year pre-professional training before admission to the Medical colleges;*

Or

(b) *The intermediate examination in science of an Indian University/Board or other recognised examining body with Physics, Chemistry and Biology/Bio-technology which shall include a practical test in these subjects and also English as a compulsory subject;*

Or

(c) *The pre-professional/pre-medical examination with Physics, Chemistry and Biology/Bio-technology, after passing either the higher secondary school examination, or the pre-university or an equivalent Examination. The pre-professional/pre-medical examination shall include a practical test in Physics, Chemistry and Biology/Bio-technology and also English as a compulsory subject;*

Or

- (d) *The first year of the three years degree course of a recognized university, with Physics, chemistry and Biology/Bio-technology including a practical test in three subjects provided the examination is a "University Examination" and candidate has passed 10+2 with English at a level not less than a core course;*

Or

- (e) *B.Sc. examination of an Indian University, provided that he/she has passed the B.Sc. examination with not less than two of the following subjects Physics, Chemistry, Biology (Botany, Zoology)/Bio-technology and further that he/she has passed the earlier qualifying examination with the following subjects – Physics, Chemistry, Biology and English.*

Or

- (f) *Any other examination which, in scope and standard is found to be equivalent to the intermediate science examination of an Indian University/Board, taking Physics, Chemistry and Biology/Bio-technology including practical test in each of these subjects and English.*

**COURSE OF STUDY:**

(1) Every student shall undergo a period of certified course of study extending over 4 ½ academic years followed by one year of compulsory rotatory resident internship. The first MBBS course shall commence in the month of August in every academic year.

(2) The period of 4 ½ years is divided into three phases as follows:

a. **Phase –I (I MBBS) One year** consisting of Pre-clinical subjects – i) Human Anatomy ii) Physiology iii) Bio – Chemistry, Besides 60 hours for introduction to Community Medicine including Humanities, rest of the time shall be equally divided between Anatomy and Physiology plus Bio-chemistry combined (Physiology 2/3 and Bio-Chemistry 1/3).

**The Phase I – I M.B.B.S.** (approximately 240 teaching days) shall be occupied in the Phase I (Pre-clinical) subjects.

No student shall be permitted to join the Phase II (Para-clinical/clinical) group of subjects until he/she has passed in all Phase I (Pre-clinical) subjects.

\*"The supplementary examination for 1st Professional MBBS examination may be conducted within 6 months so that the students who pass can join the main batch and the failed students will have to appear in the subsequent year provided that the students who pass the supplementary examination shall be allowed to appear in the second professional MBBS examination only after he/she completes the full course of study of three semesters (i.e. 18 months) for the second professional MBBS examination irrespective of the examination of the main batch."

*\*Modification as per MCI Norms and notification published on 19.04.2010 in the Gazette of India and approved in the 28<sup>th</sup> Academic Council Meeting of SRM University held on 23.03.2015.*

b. **Phase-II (II MBBS) 1 ½ years** consisting of para clinical/clinical subjects. During this phase, teaching of para-clinical and clinical subjects shall be done concurrently.

The para-clinical subjects shall consist of :-

1. Pathology, ii) Pharmacology, iii) Microbiology iv) Forensic Medicine including Toxicology and v) Part of Community Medicine.

The clinical subjects shall consist of all those detailed below in Phase III.

Out of the time for Para-clinical teaching, approximately equal time shall be allotted to Pathology, Pharmacology, Microbiology and Forensic Medicine and Community Medicine combined(1/3) Forensic Medicine and (2/3) Community Medicine.

After passing pre-clinical subjects, 1 ½ years shall be devoted to para-clinical subjects. Phase II will be devoted to Para-clinical and clinical subjects, along with clinical postings. During clinical phase – (Phase III) pre-clinical and para-clinical teaching shall be integrated into the teaching of clinical subjects wherever relevant.

c. **Phase – III (IIIMBBS) Two years** :- Continuation of study of clinical subjects from Phase – II.

The clinical subjects to be taught during Phase II and III are: i) Medicine and its allied specialties, ii) Surgery and its allied specialties, iii) Obstetrics and Gynaecology and iv) Community Medicine.

Besides clinical posting, the rest of the teaching hours should be divided between didactic lectures, demonstration, seminars, group discussions etc. in various subjects.

The training in Medicine and its allied specialties will include General Medicine, Paediatrics, Pulmonary medicine, Dermatology, Psychiatry, Radio-diagnosis, Infectious diseases etc.

The training in Surgery and its allied specialties will include General Surgery, Orthopaedics Surgery including Physiotherapy and Rehabilitation, Ophthalmology, Oto-Rhino-Laryngology, Anaesthesia, Dentistry, Radio-therapy etc. The Obstetrics & Gynaecology training will include Family Medicine, Family welfare planning etc.

### Prescribed Teaching Hours:-

Following minimum teaching hours are prescribed in various disciplines:

#### A. Pre-Clinical Subjects: (Phase- 1 –First and Second Semester)

Anatomy	650 Hours
Physiology	480 Hours
Biochemistry	240 Hours
Community Medicine	60 Hours

#### B. Prara-Clinical Subjects: (Phase-II – 5<sup>th</sup> to 7<sup>th</sup> Semester)

Pathology	300 Hours
Pharmacology	300 Hours
Microbiology	250 Hours

Community Medicine 200 Hrs. (including 8 weeks postings of 3 hrs each)

Forensic medicine	100 Hours
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Teaching of para-clinical subjects shall be 4 hrs per day in 3<sup>rd</sup> hrs semester and 3 hrs per day in 4<sup>th</sup> and 5<sup>th</sup> semester (See attached Time Table)

#### C. Clinical Subjects

1. Clinical postings are per chart attached.
2. Theory lectures, demonstrations and Seminars etc. in addition to clinical postings as under. The clinical lecture to be held from 4<sup>th</sup> semester onwards (See attached Time Table)

Gen Medicine	300 Hours	Gen Surgery	300 Hours
Paediatrics	100 Hours	Orhopedics	100 Hours
T.B. and Chest	20 Hours	Ophthalmology	100 Hours
Psychiatry	20 Hours	ENT	70 Hours
Skin and STD	30 Hours	Radiology	20 Hours
Community Medicine	50 Hours	Dentistry	10 Hours
Anaesthesia	20 Hours	Obst & Gynae.	300 Hours

During semesters 3 to 9 following clinical postings for each student, of 3 hrs.duration is suggested for various departments after introductory course in Clinical Methods in Medicine and Surgery of 2 weeks each for the whole class

This period of training is minimum suggested. Adjustments where required depending on availability of time be made.

This period of training does not include university examination period.Extra time available be devoted to other Sub-specialities.

<b>Subjects</b>	<b>3<sup>rd</sup> semester weeks</b>	<b>4<sup>th</sup> semester weeks</b>	<b>5<sup>th</sup> semester weeks</b>	<b>6<sup>th</sup> semester weeks</b>	<b>7<sup>th</sup> semester weeks</b>	<b>8<sup>th</sup> semester weeks</b>	<b>9<sup>th</sup> semester weeks</b>	<b>Total</b>
Gen Medicine***	6	-	4	-	4	6	6	26
Paediatrics	-	2	-	2	2	4	-	10
TB and Chest	-	2	-	-	-	-	-	02
Skin and STD	-	2	-	2	-	2	-	06
Psychiatry	-	-	2	-	-	-	-	02
Radiology*	-	-	-	-	2	-	-	02
Gen Surgery****	6	-	4	-	4	6	6	26
Orthopaedics**	-	-	4	4	-	-	2	10
Ophthalmology	-	4	-	4	-	-	2	10
ENT	-	4	-	4	-	-	-	08
OBG	2	4	4	-	4	4	6	24
Community Medicine	4	4	-	4	-	-	-	12
Casualty	-	-	-	2	-	-	-	02
Dentistry	-	-	-	-	2	-	-	02
<b>Total</b>	<b>18</b>	<b>22</b>	<b>18</b>	<b>22</b>	<b>18</b>	<b>22</b>	<b>22</b>	<b>142</b>

- Clinical methods in Medicine and Surgery for whole class will be for 2 weeks each respectively at the start of 3<sup>rd</sup> semester.

\* This posting includes training in Radiodiagnosis and Radiotherapy where existant.

\*\*This posting includes exposure to Rehabilitation and Physiotherapy.

\*\*\*This posting includes exposure to laboratory medicine and infectious diseases.

\*\*\*\*This posting includes exposure to dressing and Anaesthesia

\*\*\*\*\*This includes maternity training and Family medicine and the 3<sup>rd</sup> semester posting shall be in Family Welfare Planning.

### 1. Commencement of the Course:

From July/August of the Academic year.

### 2. Working Days in an Academic Year

Each academic year shall consist of not less than 240 working days

### 3. Curriculum:

The curriculum and the syllabi for the course shall be as specified in the regulations.



Program wise Course - SRM Regulation 2015  
 Institution: SRM Medical College Hospital and Research Centre  
 Program: MBBS – Bachelor of Medicine and Bachelor of Surgery

COURSE CODE	DESCRIPTION
<b>I YEAR - MBBS</b>	
MBS15101	HUMAN ANATOMY – PAPER I
MBS15102	HUMAN ANATOMY – PAPER II
MBS15103	HUMAN PHYSIOLOGY – PAPER I
MBS15104	HUMAN PHYSIOLOGY – PAPER II
MBS15105	BIOCHEMISTRY – PAPER I
MBS15106	BIOCHEMISTRY – PAPER II
<b>II YEAR - MBBS</b>	
MBS15201	PHARMACOLOGY – PAPER I
MBS15202	PHARMACOLOGY – PAPER II
MBS15203	MICROBIOLOGY – PAPER I
MBS15204	MICROBIOLOGY – PAPER II
MBS15205	PATHOLOGY – PAPER I
MBS15206	PATHOLOGY – PAPER II
MBS15207	FORENSIC MEDICINE
<b>PRE FINAL YEAR - MBBS</b>	
MBS15301	COMMUNITY MEDICINE – PAPER I
MBS15302	COMMUNITY MEDICINE – PAPER II
MBS15303	OPHTHALMOLOGY
MBS15304	OTORHINOLARYNGOLOGY (ENT)
<b>FINAL YEAR - MBBS</b>	
MBS15401	GENERAL MEDICINE – PAPER I
MBS15402	GENERAL MEDICINE - PAPER II (Including Psychiatry, Dermatology STD, Tuberculosis And Chest Diseases)
MBS15403	GENERAL SURGERY AND ALLIED SPECIALITIES
MBS15404	SURGERY INCLUDING ORTHOPEDICS
MBS15405	OBSTETRICS INCLUDING SOCIAL OBSTETRICS
MBS15406	GYNAECOLOGY INCLUDING FAMILY WELFARE
MBS15407	PAEDIATRICS

#### **4. Medium of instruction:**

English shall be the medium of instruction for all the subjects of study and for examinations.

#### **5. Submission of laboratory record note books**

At the time of practical/clinical examination each candidate shall submit to the Examiners his/her laboratory note books duly certified by the Head of the Department as a bonafide record of the work done by the candidate.

The Practical record shall be evaluated by the concerned Head of the Department (Internal Evaluation) and the practical record marks shall be submitted to the University 15 days prior to the commencement of the theory examinations.

The candidate may be permitted by the examiners to refer to the practical record book during the practical examination in the subject of Biochemistry only. No other materials, handwritten, cyclostyled or printed guides are allowed for reference during the practical examinations.

In respect of failed candidates the marks awarded for records at previous examinations will be carried over to the next examinations. If a candidate desire he/she may be permitted to improve his/her performance by submission of fresh records.

#### **6. Internal Assessment:**

The Internal Assessment consists of the following points:

- a) Theory                      b) Practical/Clinical                      c) Viva Voce

- a) All the details regarding Internal Assessment should be sent to the University by the last week of December / June for 100 marks and the aggregate of final Internal Assessment marks at the end of June for 80 marks by the Head of the Department of the subject concerned through the Dean/Principal of the College. The aggregate of Final Internal Assessment Marks submitted at the end of June for 80 marks shall be taken by the University as Internal Assessment Marks for permitting the candidates to sit for the examinations.

The average of the Theory, Practical/Clinical & Oral should be added and aggregate must be taken and sent to the University as Internal Assessment Marks; 35% of minimum marks is necessary to appear for the examinations.

The Internal Assessment marks must be exhibited periodically on the Notice Board after completion of the Internal Assessment examination for the knowledge of the students.

Five Internal Assessment Tests must be conducted in all phases of MBBS course.

The Weightage for Theory and Practical Examinations are detailed below:-

#### THEORY INTERNAL ASSESSMENTS

First Internal Assessment	-	15%
Second Internal Assessment	-	15%
Third Internal Assessment	-	20%
Fourth Internal Assessment	-	20%
Fifth Internal Assessment	-	30%

#### PRACTICAL EXAMINATIONS

First Practical	-	30%
Second Practical	-	30%
Third Practical	-	40%
Records Book	-	10 marks

Note: The candidate has to secure 35% Marks to become eligible for appearing in the University Examinations.

b) A failed candidate in any subject should be provided an opportunity to improve his/her internal assessment marks by conducting a minimum of two examinations in theory and practical separately and average, be considered for improvement.

c) The Internal assessment marks (both in written and practical taken together) should be submitted to the University endorsed by the Head of the institutions fifteen days prior to the commencement of the theory examinations.

**Note:** Clause 6 – Internal assessment – Under Note – 35% marks to become eligible for appearing in the University Examinations. It should be clearly stated that candidate Should secure or obtain minimum 35% of Internal Assessment marks (sum of theory I.A and practical I.A) i.e., 14 out of 40 or 21 out of 60 or 28 out of 80 or 42 out of 120 as the case may be.

**SRM UNIVERSITY**  
**FACULTY OF MEDICINE**  
**BACHELOR OF MEDICINE AND BACHELOR OF SURGERY**  
**DISTRIBUTION OF MARKS WITH PASSING MINIMUM**

<b>I - PROFESSIONAL YEAR (Pre-Clinical Subjects)</b>				
Subject code	Subject title	Evaluation parameter	Passing minimum	Maximum Marks
MBS15101 (paper-I)	Human Anatomy	Written (2 Papers)	100	200
		Written including oral	120	240
		Practical	40	80
MBS15102 (paper-II)		Internal Assessment (Theory-40; Practical-40)	28	80
		overall	200	400
MBS15103 (paper-I)		Human Physiology	Written (2 Papers)	100
	Written including oral		120	240
	Practical		40	80
MBS15104 (paper-II)	Internal Assessment (Theory-40; Practical-40)		28	80
	overall		200	400
MBS15105 (paper-I)	Biochemistry		Written (2 Papers)	100
		Written including oral	120	240
		Practical	40	80
MBS15106 (paper-II)		Internal Assessment (Theory-40; Practical-40)	28	80
		overall	200	400

Marks qualifying for pass 50% in Theory

50% in Theory including Viva-Voce

50% in Practicals

35% in Internal Assessment

50% in Total Aggregate

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**DISTRIBUTION OF MARKS WITH PASSING MINIMUM**

<b>II - PROFESSIONAL YEAR (Para-Clinical Subjects)</b>				
Subject code	Subject title	Evaluation parameter	Passing minimum	Maximum Marks
MBS15201 (paper-I)	Pharmacology	Written (2 Papers)	80	160
		Written including oral	95	190
		Practical	25	50
MBS15202 (paper-II)		Internal Assessment (Theory-30; Practical-30)	21	60
		overall	150	300
MBS15203 (paper-I)	Microbiology	Written (2 Papers)	80	160
		Written including oral	95	190
		Practical	25	50
MBS15204 (paper-II)		Internal Assessment (Theory-30; Practical-30)	21	60
		overall	150	300
MBS15205 (paper-I)	Pathology	Written (2 Papers)	80	160
		Written including oral	95	190
		Practical	25	50
MBS15206 (paper-II)		Internal Assessment (Theory-30;Practical-30)	21	60
		overall	150	300
MBS15207	Forensic Medicine	Written (1 Paper)	40	80
		Written including oral	50	100
		Practical	30	60
		Internal Assessment (Theory-20; Practical-20)	14	40
		overall	100	200

Marks qualifying for pass 50% in Theory  
50% in Theory including Viva-Voce  
50% in Practicals  
35% in Internal Assessment  
50% in Total Aggregate

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**DISTRIBUTION OF MARKS WITH PASSING MINIMUM**

<b>III- PROFESSIONAL YEAR – Part 1</b>				
<b>(Clinical Subjects)</b>				
Subject code	Subject title	Evaluation parameter	Passing minimum	Maximum Marks
MBS15301 (paper-I)	Community Medicine	Written (2 Papers)	120	240
		Written including oral	130	260
		Practical	30	60
MBS15302 (paper-II)		Internal Assessment (Theory-40; Practical-40)	28	80
		Overall	200	400
MBS15303	Ophthalmology	Written (1 Paper)	40	80
		Written including oral	50	100
		Practical	30	60
		Internal Assessment (Theory-20;Practical-20)	14	40
		Overall	100	200
MBS15304	Oto-Rhino- Laryngology	Written (1 Paper)	40	80
		Written including oral	50	100
		Practical	30	60
		Internal Assessment (Theory-20; Practical-20)	14	40
		Overall	100	200

Marks qualifying for pass 50% in Theory  
50% in Theory including Viva-Voce  
50% in Practicals  
35% in Internal Assessment  
50% in Total Aggregate

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**BACHELOR OF MEDICINE AND BACHELOR OF SURGERY**  
**DISTRIBUTION OF MARKS WITH PASSING MINIMUM**

<b>IV - PROFESSIONAL YEAR</b>				
<b>(Clinical Subjects)</b>				
Subject code	Subject title	Evaluation parameter	Passing minimum	Maximum Marks
MBS15401 (paper-I)	General Medicine	Written (2 Papers)	120	240
		Written including oral	140	280
		Practical	100	200
		Internal Assessment (Theory-60; Practical-60)	42	120
		overall	300	600
MBS15402 (paper-II)	General Medicine	Written (2 Papers)	120	240
		Written including oral	140	280
		Practical	100	200
		Internal Assessment (Theory-60; Practical-60)	42	120
		overall	300	600
MBS15403 (paper-I)	General Surgery	Written (2 Papers)	120	240
		Written including oral	140	280
		Practical	100	200
		Internal Assessment (Theory-60; Practical-60)	42	120
		overall	300	600
MBS15404 (paper-II)	General Surgery	Written (2 Papers)	120	240
		Written including oral	140	280
		Practical	100	200
		Internal Assessment (Theory-60; Practical-60)	42	120
		overall	300	600
MBS15405 (paper-I)	Obstetrics and Gynaecology	Written (2 Papers)	80	160
		Written including oral	110	220
		Practical	50	100
		Internal Assessment (Theory-40; Practical-40)	28	80
		overall	200	400
MBS15406 (paper-II)	Obstetrics and Gynaecology	Written (2 Papers)	80	160
		Written including oral	110	220
		Practical	50	100
		Internal Assessment (Theory-40; Practical-40)	28	80
		overall	200	400
MBS15407	Pediatrics	Written (1 Paper)	40	80
		Written including oral	50	100
		Practical	30	60
		Internal Assessment (Theory-20; Practical-20)	14	40
		overall	100	200

**Marks qualifying for pass:**

50% in Theory  
50% in Practicals excluding viva voce & records  
35% in Internal Assessment  
50% in Total Aggregate

**Eligibility to appear for examination**

**Attendance = 75 percent**  
**Internal Assessment Marks = 35 percent**

## 7. Attendance Required For Admission to Examination

- a) No candidate shall be permitted to any one of the parts of MBBS Examinations unless he/she has attended the course in the subjects for the prescribed period and produce the necessary certificate of study, attendance and progress from the Head of the Institution.
- b) A candidate is required to put in minimum 75% of attendance in both theory and practical/clinical separately in each subject before admission to the examination.
- c) A candidate lacking in the prescribed attendance in any one subject in the first appearance shall be detained admission to the all the subjects.
- d) Detained candidates due to lack of Attendance / Internal Assessment marks, who are not promoted to the next phase of study are required to put in minimum 75% of attendance and improve the internal assessment marks during the extended period of study before appearing for the next examination.

## 8. Regulations for condonation of lack of attendance:

There shall be no condonation of lack of attendance for the course. However exceptional cases, condonation will be considered on merit of the cases.

## 9. University Examinations

### Commencement of Examination:

a. **July /January**

b. Theory examinations not to be held on Saturdays and Sundays. If the date of commencement of the examination falls on a public holiday, the next working day will be the date of commencement of examination.

Phase Distribution and Timing of Examinations:-

**6 MONTHS**

**6 MONTHS**

**6 MONTHS**

1

2

Ist professional examination (during second semester)

3

4

5

IIInd professional examination (during fifth semester)

6

7

IIIrd professional Part I (during 7th semester)

8

9

IIIrd professional Part II (Final Professional).



**First Professional:-**

In the second Semester of Phase 1 training, in the subjects of Anatomy, Physiology and Bio-Chemistry.

**Second Professional:-**

In the Fifth Semester of Phase II training, in the subjects of Pathology, Microbiology, Pharmacy and Forensic Medicine.

**Third Professional:-**

Part 1-in the Seventh Semester of Phase III, in the subjects of Ophthalmology, Otorhynolaryngology and Community Medicine.

**Third Professional:-**

Part II-(Final Professional) –At the end of Phase III training in the subjects of Medicine, Surgery, Obstetrics & Gynecology and Pediatrics.

**Promotion criteria**

a) Passing in 1<sup>st</sup> Professional is compulsory before proceeding to Phase II training.

\*“The supplementary examination for 1st Professional MBBS examination may be conducted within 6 months so that the students who pass can join the main batch and the failed students will have to appear in the subsequent year provided that the students who pass the supplementary examination shall be allowed to appear in the second professional MBBS examination only after he/she completes the full course of study of three semesters (i.e. 18 months) for the second professional MBBS examination irrespective of the examination of the main batch.”

*\*Modification as per MCI Norms and notification published on 19.04.2010 in the Gazette of India and approved in the 28<sup>th</sup> Academic Council Meeting of SRM University held on 23.03.2015.*

b) A student, who fails in the II<sup>nd</sup> professional examination, should not be allowed to appear III<sup>rd</sup> Professional Part I examination unless he passes all subjects of II<sup>nd</sup> Professional examination.

c) Passing in III<sup>rd</sup> Professional (Part-1) is compulsory for being eligible for III<sup>rd</sup> Professional (Part II) examination

**Revaluation of Answer Papers:**

There is no provision for revaluation of answer papers. However, re-totalling is allowed in the failed subjects.

**Re-admission after break of study:**

As per the procedure laid down in a common Regulation for all the Undergraduate and Post-graduate courses of this University.

## **GENERAL CONSIDERATIONS AND TEACHING APPROACH**

1. The graduate medical curriculum is oriented towards training students to undertake the responsibilities of a physician of first contact, who is capable of looking after the preventive, promotive, curative and rehabilitative aspects of medicine.
2. The training is broad based and flexible and aims to provide an educational experience of the essentials required for health care in our country.
3. To undertake the responsibilities of varying service conditions, placement, training and opportunities will be provided to acquire basic training in different aspects of medical care.
4. The important community aspects of health care services are a built – in feature in the curriculum by providing adequate exposure to field practice areas and training as a student and later as intern.
5. Apart from teaching all the basic concepts of modern scientific medical education, the training will be health and community – oriented instead of merely curative.
6. Self learning methods and techniques find an important place in the curriculum.
7. The medical graduate will be so trained as to become capable of functioning independently both in urban and rural environment and well versed in managing common problems of health and disease without undue specialization.
8. The importance of the social factors, population control and family welfare planning are emphasized throughout the community based educational process.
9. The cultivation of logical and scientific thinking, clarity of expression, ability to collect and analyze information and co-relating all for independent judgment is emphasized throughout the syllabus.
10. A knowledge of history of medicine embracing the evolution of medical knowledge in India and the rest of the world is an important component in the education process.
11. All opportunities will be provided to the students for hands on experience in the practical sessions, in the hospital and communities in addition to the usual lecture classes.
12. Training in clinical subjects is based on outpatient teaching, emergency care and within the community including peripheral care institutions.
13. Clinical teaching is planned for small groups of students to provide individual attention to improve skill and competence.
14. Proper records of the work done by the students will be maintained and will form an important basis for internal assessment.
15. Integrated teaching will be encouraged, both horizontally and vertically to avoid compartmentalization of disciplines and provide understanding and resolution of clinical as well as community problems.
16. Encouraging the students to participate in group discussions and seminars throughout the course will enable them to function independently or as a team leader.
17. A separate Medical Education Unit is functioning to provide learning resource material to teachers and faculty development.
18. The subjects of Medical Ethics, Computer literacy, Health Statistics and Health Economics will be introduced at an early stage of the course.
19. The subject of simulation is introduced as a curriculum for MBBS as approved by the Academic council of SRM University
20. The overall teaching – learning process for the students will be innovative and educative within the larger frame work of the MCI Guidelines.

## I MBBS HUMAN ANATOMY

### **GOAL:**

The broad goal of the teaching of undergraduate students in Anatomy aims at providing comprehensive knowledge of the gross and microscopic structure and development of human body to provide a basis for understanding the clinical correlation of organs of structures involved and the anatomical basis for the disease presentations.

### **OBJECTIVES:**

#### **KNOWLEDGE:**

At the end of the course the student shall be able to:

- a. Comprehend the normal disposition, clinically relevant interrelationships, functional and cross sectional anatomy of the various structures in the body;
- b. Identify the microscopic structure and correlate elementary ultra structure of various organs and tissues with the functions as a prerequisite for understanding the altered state in various disease processes;
- c. Comprehend the basic structure and connections of the central nervous system to analyze the integrative and regulative functions of the organs and systems. He/She shall be able to locate the site of gross lesions according to the deficits encountered.
- d. Demonstrate knowledge of the basic principles and sequential development of the organs and systems; recognize the clinical stages of development and the effects of common teratogens.

He/She shall be able to explain the developmental basis of the major variations and abnormalities.

#### **SKILLS:**

At the end of the course the student shall be able to:

- a. Identify and locate all the structures of the body and mark the topography of the living anatomy.
- b. Identify the organs and tissues under the microscope;
- c. Understand the principles of karyotyping and identify the gross congenital anomalies;
- d. Understand the principles of newer imaging techniques like Ultra sound, Computerised Tomography Scan, Interpretation of plain and contrast X – rays.
- e. Understand clinical basis of some common clinical procedures i.e.intra-muscular and intravenous injection, lumbar puncture, kidney biopsy etc.

#### **INTEGRATION:**

From the integrated teaching of other basic sciences, student shall be able to comprehend the regulation and integration of the functions of the organs and systems in the body and thus interpret the anatomical basis of disease processes.

## SYLLABUS

### Goals

To provide the basic knowledge and understanding of the structure of the human body in detail

### Objectives

To enable the students to have a better understanding of the human anatomy

- a) Must know (60%)
- b) May know (30%)
- c) Desirable to know (10%)

### I. General Anatomy

#### Must Know

Classification of Joints

#### May Know

Position and terms, classification of bones and blood supply of long bone, Endocrines, Digestive system

#### Desirable to Know

Basic outline of muscular system, cardiovascular system, Nervous system, Respiratory system, urogenital system, Integumentary system.

### II. UPPER LIMB

#### Must Know

Breast, Axilla, Clavipectoral fascia, Deltoid, Front and back of arm muscles, Shoulder joint, Arteries – Axillary, brachial, radial, ulnar & Arches  
Nerves – Brachial plexus, axillary, median, radial, ulnar and musculo cutaneous nerve  
Spaces – Quadrangular, triangular  
Retinacula – Extensor, Flexor  
Bones – Clavicle, Scapula, Humerus, Applied anatomy

#### May Know

Pectoral region, Scapular region, Front of forearm - muscles,  
Hand – palm and dorsum muscles,  
Veins – arch, cephalic, basilic, median cubital, axillary vein.  
Fossa – Cubital and anatomical snuff box.  
Palmar & pulp spaces  
Bones – Radius & Ulna  
Carpo metacarpal joint of thumb  
Surface anatomy

### **Desirable to Know**

Back of forearm muscles, Joints - elbow, radio ulnar, wrist – muscles and movements

Carpal bones

## **III. LOWER LIMB**

### **Must Know**

Thigh – Femoral triangle, adductor canal, muscles of front of thigh

Gluteal region – Muscles, nerves, vessels.

Back of thigh – Muscles

Joints – Hip & Knee

Artery – Femoral & Popliteal

Veins – Saphenous veins, Perforators

Nerves – Sciatic, tibial, common peroneal, femoral nerve & obturator nerve

Fossa – Popliteal

Sheath – Femoral

Bones – Hip, femur, tibia,

Applied anatomy

### **May Know**

Medial region of thigh

Leg – Anterior, peroneal, posterior compartments – Muscles, nerves & Blood vessels

Foot – Dorsum, sole – Plantar aponeurosis

Joints – Arches of foot, Sub talar joints

Retinacula – Extensor, flexor, peroneal

Inguinal lymph nodes

Iliotibial tract

Artery - Tibial, arches and anastomosis

Nerve – Plantar nerves

Patella

Inversion & Eversion

Surface Anatomy

### **Desirable to Know**

Ankle, mid tarsal joints

Veins – Popliteal femoral and venous arch

Bones – Patella, fibula, calcaneum, talus, cuboid and navicular.

## **IV. ABDOMEN, PELVIS, PERINEUM**

### **Must Know**

Anterior abdominal wall – Rectus sheath, inguinal canal, umbilicus  
Testis, Spermatic cord,  
Stomach  
Lesser sac, hepato renal pouch, Recto uterine pouch and peritoneal folds  
Liver, extra hepatic biliary apparatus  
Duodenum, pancreas, portal vein, spleen  
Kidney, Urinary bladder  
Prostate Gland  
Rectum and anal canal  
Female internal genital organs – Uterus, uterine tube & ovary  
Applied Anatomy

### **May Know**

Quadrants (regions), Ureter, Great vessels of the abdomen,  
Anal region - Ischiorectal fossa, Pelvis – Male & female  
Bones – Lumbar vertebra  
Pelvic floor – muscles and fascia  
Urogenital Region – Male and female  
Lumbar plexus  
Surface anatomy

### **Desirable to Know**

Penis & epididymis  
Seminal vesicle  
Posterior abdominal wall – muscles and fascia

## **V. THORAX**

### **Must Know**

Mediastinum – subdivisions and contents  
Pleura and recesses  
Lungs and Bronchopulmonary segments.  
Heart and pericardium  
Diaphragm  
Applied Anatomy

### **May Know**

Thoracic Wall, spaces  
Phrenic nerve, Thoracic duct & Oesophagus.  
Azygos vein

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Bones – sternum, ribs, vertebrae, Surface Anatomy

**Desirable to Know**

Sympathetic chain

Joints

**VI. HEAD AND NECK**

**Must Know**

Triangle – anterior, posterior, superficial structures in the neck (Thyroid)

Cranial cavity – Dural folds and sinuses

Orbit

Fossa – temporal and infra temporal

Salivary Glands – Parotid and submandibular

Artery – CCA, ECA, ICA – Branches

Subclavian & vertebral

Vein – RMV, EJV, IJV – tributaries

III, IV, VI, VII cranial nerves,

Ansa cervicalis

Nose –Septum, lateral wall

Pharynx

Tongue and palate

Larynx

Middle ear

Bones – skull, base, cranial fossae and foramina, Mandible, Maxilla, vertebrae

Applied Anatomy

**May Know**

Scalp and Face

Suboccipital triangle

Deep structures in neck

Pituitary gland

Joints – TM joints

V<sup>th</sup> Cranial nerve

X XII cranial nerves

Cervical lymph nodes

Para nasal air sinuses

Mastoid antrum

VIII, IX, XI Cranial nerves

Surface Anatomy

### **Desirable to Know**

Head & neck joints  
I & II Cranial nerves  
Eye ball  
Ear – External & Internal ear  
Fetal skull

## **VII. BRAIN & SPINAL CORD**

### **Must Know**

**Spinal cord** - Coverings, External & Internal Feature

Blood supply  
Applied Anatomy

### **BRAIN**

Coverings

Brain Stem – Medulla Oblongata, Pons, Mid Brain sections, Cerebellum  
Cerebrum – Sulci, Gyri, functional Areas, White matter, blood supply of brain,  
Fourth ventricle  
Applied anatomy

### **May Know**

Medulla Oblongata, Pons, Mid Brain – Features  
Cerebellar peduncles, Lateral ventricle, CSF circulation, Sub arachnoid cistern  
Third ventricle  
Thalamus and Hypothalamus  
Surface Anatomy

### **Desirable to Know**

Basal ganglia

## **VIII. EMBRYOLOGY**

### **Must Know**

General – germ cells and maturation, fertilization, Cyto-Genetics,  
Derivatives of foregut, midgut, hindgut, Development of liver, pancreas, neural  
tube, neural crest, Development of heart, development of testis, Ovary, uterus,  
kidney & urinary bladder, Derivatives of pharyngeal arches, aortic arches,  
development of face & palate.

### **May Know**

Placenta  
Rotation of gut  
Development of respiratory system



Development of nervous system

**Desirable to Know**

Tetratology, Twinning and multiple births

Coelomic cavities

Development of portal vein

**IX. HISTOLOGY**

**Must Know**

General – Epithelium, cartilage, bone, muscles, vessels, lymphoid organs and skin.

Special – Systems – Gastro-intestinal and associated glands, tongue (papilla) salivary glands; respiratory (Trachea, lungs), excretory (Kidney, Ureter, Urinary bladder), reproductive (male and female) (Testis, Epididymis, vasdeferens, uterus, ovary,) endocrine glands, cornea, retina, cerebellum, cerebrum, spinal cord (Thoracic level)

**May Know**

Glands, Connective tissue, Prostate, ganglia, Spinal cord,

Placenta,

Mammary gland,

Umbilical cord,

Uterine tube

**Desirable to Know**

Microscope

Nerve, seminal vesicle, penis,

**X. RADIOLOGICAL ANATOMY**

**Must Know**

X-ray-plain

X-ray-Contrast

**Desirable to Know**

Sonogram

CT scan

MRI

## UNIVERSITY EXAMINATION PATTERN

### THEORY

Papers – I & II, each 3 hrs and marks 100

Paper I – General Anatomy, Embryology, Genetics and Histology  
Upper and lower extremities  
Abdomen, Pelvis, Perineum and related histology and Embryology.

Paper II – Thorax, diaphragm  
Head and Neck  
Brain and Spinal cord  
Related embryology and histology

### PAPER I

#### **PART - B**

2 Essays		=30 marks
Limbs	1 essay	= 15 marks (structured/split up)
Abdomen and Pelvis	– 1 essay	= 15 marks (structured/split up)

#### **PART - C**

Short notes-	5x5 marks	= 25 marks
From gross Anatomy, Embryology, Genetics and Histology of paper I portion		

#### **PART - D**

Short notes	5x5marks	=25 marks
Applied Anatomy from paper I portion		

#### **PART - A**

**Multiple choice Questions (20 questions)** = 20 x 1 = 20 marks

Distribution

General Anatomy, Embryology, Histology	= 4 qs
Upper extremity	= 4 qs
Lower extremity	= 4 qs
Abdomen, Pelvis, Perineum	= 8 qs

Total	= 100 marks
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## PAPER II

### **PART - B**

2 Essays	=30 marks
Thorax – 1 essay	= 15 marks (structured/split up)
Head and neck-1 essay	= 15 marks (structured/split up)

### **PART – C**

Short notes –5x5marks	= 25 marks
Gross Anatomy, Embryology and Histology of paper II portion	

### **PART – D**

Short notes – 5x5 marks	= 25 marks
Applied Anatomy from paper II portion	

### **PART – A**

**Multiple choice Questions (30 questions) = 20 x 1 = 20 marks**

Distribution

Thorax = 6 qs.

Head and Neck = 10 qs.

Brain and Spinal cord = 4 qs.

Total = 100 marks

## PRACTICAL EXAMINATION

Gross Anatomy and Histology – spotters and discussion = 40 marks

### **GROSS ANATOMY**

#### **I Spotters – 10x2 = 20 marks**

1 minute for each spotter with sub questions

Distribution

Upper extremity / lower extremity – 2

Thorax, brain and spinal cord – 3

Abdomen and pelvis 2 + 1 – 3

Head and Neck -2

#### **II DISCUSSION – 2 x 10 = 20 marks**

Paper I – 1 specimen

Paper II – 1 specimen

Cross-sectional Anatomy can be kept as any one specimen for discussion.

**Total = 40 marks**

## HISTOLOGY

### **I Spotters – 10 x 2 = 20 marks**

1 minute for each spotter with 2 salient features for its identification to be mentioned

Distribution

General histology	– 3 slides
Special histology	- 6 slides
Genetic chart	- 1

### **II DISCUSSION –2 x 10 = 20 marks**

General – 1 slide

Special - 1 slide

**Total = 40 marks**

**Grand total 40 + 40 = 80 marks**

**Viva voce - 40 marks**

Distribution

Osteology	10marks
Radiology	10marks
Embryology	10marks
Surface marking	10marks

### **Minimum for pass:**

50% in internal assessment (80 marks)+ Theory (200) + Viva (40)	160/320
50% in practical (80 marks)	40/80

### **Eligibility to appear for examination**

<b>Attendance</b>	<b>= 75 percent</b>
<b>I.A Marks</b>	<b>= 35 percent</b>

**M.B.B.S DEGREE EXAMINATION**

**I YEAR MBBS**

**ANATOMY PAPER- I & II**

**Time: Three hours**

**Max.Marks:100**

**Two hours and forty minutes**

**Part – A: 20 Marks**

**For Part – B, Part – C & Part – D For Part – B, Part – C & Part – D: 80 Marks**

**Answer ALL questions  
Illustrate the answer with suitable diagrams**

**PART – A (20 X 1= 20 Marks)**

**I. Multiple Choice Questions**

Must Know – 10

May Know - 10

**PART – B (2 X 15= 30 Marks)**

**II. Essay Questions**

1. (Must Know)

2. (Must Know)

**PART - C (5 X 5= 25 Marks)**

**III. Write short notes on:**

1. (Must Know)

2. (Must Know)

3. (Must Know)

4. (May know)

5. (Desirable to Know)

**PART – D (5 X 5 = 25 Marks)**

**IV. Write short notes on:**

1. (Must Know)

2. (May know)

3. (May know)

4. (May know)

5. (Desirable to know)

**Model Question Paper**  
**M.B.B.S Degree Examination**  
**I YEAR MBBS**  
**MBS15101 - Human Anatomy - Paper- I**

**Time: Three hours**

**Max.Marks:100**

**Two hours and forty minutes**

**Part – A: 20 Marks**

**For Part – B, Part – C & Part – D For Part – B, Part – C & Part – D: 80 Marks**

**Answer ALL questions**  
**Illustrate the answer with suitable diagrams**

**PART – B (2 X 15 = 30 Marks)**

**I. Essay Questions**

1. Describe the shoulder joint under the following headings: **(Must Know)**  
a) Articulating ends      b) Ligaments      c) Blood supply and nerve supply  
d) Movements and muscles producing the movements. Add a note on its applied anatomy
  
2. Describe the stomach under the following headings: **(Must Know)**  
a) Location      b) Parts      c) Relations      d) Blood supply  
e) Lymphatic Drainage f) Applied anatomy

**PART - C (5 X 5=25 Marks)**

**II. Write short notes on:**

1. Lymphatic drainage of breast **(Must Know)**
2. Karyotyping **(Must Know)**
3. Supports of uterus **(Must Know)**
4. Psoas major **(Desirable to Know)**
5. Ureter **(May know)**

**PART – D (5 X 5 = 25 Marks)**

**III. Write short notes on:**

1. Rectus sheath **(Must Know)**
2. Inversion **(May know)**
3. Ischio – rectal fossa **(May know)**
4. Superficial inguinal lymph nodes **(May know)**
5. Pulp Space **(Desirable to know)**

**PART – A (1 X 20 = 20 Marks)**

**Multiple choice questions**

**Select the most appropriate response**

1. The ulnar nerve supplies which one of the following muscles? **(Must know)**  
A) Extensor carpi ulnaris                      B) First lumbrical  
C) Second lumbrical                              D) Third lumbrical
2. Which of the following muscles has a dual nerve supply? **(Must know)**  
A) Biceps brachii                                B) Brachialis  
C) Coraco brachialis                            D) Deltoid
3. Femoral sheath is formed by **(Must know)**  
A) Peritoneum and extra peritoneal tissue  
B) Peritoneum and fascia transversalis  
C) Psoas fascia and fascia iliaca            D) Fascia transversalis and fascia iliaca
4. The long axis of the spleen corresponds to **(Must know)**  
A) 8<sup>th</sup> RIB    B) 9<sup>th</sup> RIB  
C) 10<sup>th</sup> RIB                                         D) 11<sup>th</sup> RIB
5. The fundus of stomach is supplied by: **(Must know)**  
A) Right gastric artery                         B) Left gastroepiploic artery  
C) Short gastric arteries                        D) Right gastroepiploic artery
6. The following are the supports of the uterus **EXCEPT: (Must know)**  
A) Pelvic floor                                    B) Perineal body  
C) Round ligament of uterus  
D) Anchorage of urethra to the pubic arch
7. Hassall's corpuscles are present in **(Must know)**  
A) Thyroid gland                                 B) Thymus  
C) Tonsil    D) Lymph node
8. Trigone of the bladder develops from **(Must know)**  
A) Para mesonephric ducts                    B) Mesonephric ducts  
C) Urogenital sinus                             D) Sino – vaginal bulb
9. Waddling gait occurs due to the bilateral paralysis of **(Must know)**  
A) Gluteus maximus                             B) Hamstrings  
C) Gluteus medius and gluteus minimus    D) Sartorius

10. Sensory loss in the first interdigital cleft can occur due to the injury to which of the following nerves? **(Must know)**
- A) Deep peroneal nerve                      B) Sural nerve  
C) Saphenous nerve                          D) Superficial peroneal nerve
11. Aorta bifurcates at the level of **(May know)**
- A) L3    B) L2  
C) L4    D) L5
12. Left gonadal vein opens into **(May know)**
- A) Left supra renal vein                      B) Left renal vein  
C) Inferior vena cava                          D) Internal iliac vein
13. Which of the following muscle is called as peripheral heart? **(May know)**
- A) Peroneus brevis                              B) Popliteus  
C) Plantaris                                      D) Soleus
14. Which of the following is NOT a branch of abdominal aorta? **(May know)**
- A) Testicular artery                              B) Renal artery  
C) Superior epigastric artery                      D) Superior mesenteric artery
15. The levator ani muscle has the following parts **EXCEPT: (May know)**
- A) Pubo – coccygeus                              B) Ilio – coccygeus  
C) Ano – coccygeus                              D) Ischio – coccygeus
16. Which of the following nerve is involved in carpal tunnel syndrome? **(May know)**
- A) Radial nerve                                      B) Ulnar nerve  
C) Median nerve                                      D) Musculo cutaneous nerve
17. Muscles of lateral compartment of the leg are supplied by **(May know)**
- A) Superficial peroneal nerve                      B) Deep peroneal nerve  
C) Sural nerve                                      D) Saphenous nerve
18. Which of the following is a content of deep perineal pouch? **(May know)**
- A) Ischiocavernosus                              B) Bulbospongiosus  
C) Sphincter urethrae                              D) Superficial transverse perineal
19. The narrowest and least dilatable part of male urethra is **(May know)**
- A) External urethral orifice                      B) Prostatic part  
C) Membranous part                              D) Penile part
20. Inversion, eversion takes place at **(May know)**
- A) Ankle Joint                                      B) Subtalar joint  
C) Knee Joint                                      D) Mid tarsal joint



**Model Question Paper**  
**M.B.B.S Degree Examination**  
**I YEAR MBBS**  
**MBS15102 - Human Anatomy - Paper- II**

**Time: Three hours**

**Max.Marks:100**

**Two hours and forty minutes**

**Part – A: 20 Marks**

**For Part – B, Part – C & Part – D**

**For Part – B, Part – C & Part – D:80 Marks**

**Answer ALL questions**  
**Illustrate the answer with suitable diagrams**

**PART – B (2 X 15 = 30 Marks)**

**I. Essay Questions**

1. Describe the heart under the following headings: **(Must know)**  
a) External features      b) Blood supply      c) Applied anatomy
2. Describe the lateral wall of the nose. Under the following headings: **(Must know)**  
a) Bones forming it      b) Its features      c) Blood supply  
d) Nerve supply      e) Clinical significance

**PART - C (5 X 5=25 Marks)**

**II. Write short notes on:**

1. Development of tongue      **(Must know)**
2. Tympanic membrane      **(Must know)**
3. Histology of cornea      **(Must know)**
4. External acoustic meatus      **(Desirable to know)**
5. Circle of Willis      **(May know)**

**PART – D (5 X 5 = 25 Marks)**

**III. Write short notes on:**

1. Maxillary air sinus      **(Must know)**
2. Thoracic duct      **(May know)**
3. Inferior cerebellar peduncle      **(May know)**
4. Posterior horn of lateral ventricle      **(May know)**
5. Sympathetic Chain      **(Desirable to know)**

**PART – A (1 X 20 = 20 Marks)**

**Multiple choice questions**

**Select the most appropriate response**

1. The nasal septum is formed by all of the following, **EXCEPT: (Must know)**  
A) Ethmoid bone  
B) Vomer  
C) Septal cartilage  
D) Nasal bone
2. Which of the following muscle is called as safety muscle of larynx? **(Must know)**  
A) Thyro epiglotticus  
B) Ary epiglotticus  
C) Posterior cricoarytenoid  
D) Lateral cricoarytenoid
3. All of the following are contents of carotid sheath. **EXCEPT: (Must know)**  
A) Internal carotid artery  
B) Intrenal jugular vein  
C) Ansa cervicalis  
D) Vagus nerve
4. Which of the following masticating muscle is attached to the coronoid process of mandible? **(Must know)**  
A) Masseter  
B) Temporalis  
C) Medial pterygoid  
D) Lateral pterygoid
5. Which of the following muscle is pierced by parotid duct? **(Must know)**  
A) Buccinator  
B) Masseter  
C) Medial pterygoid  
D) Lateral pterygoid
6. Which of the following nerves emerge from the junction of pons and middle cerebellar peduncle? **(Must know)**  
A) 3<sup>rd</sup> cranial nerve  
B) 4<sup>th</sup> cranial nerve  
C) 5<sup>th</sup> cranial nerve  
D) 6<sup>th</sup> cranial nerve
7. Which of the following nuclei of cerebellum is called as Roof nuclei? **(Must know)**  
A) Nucleus dentatus  
B) Nucleus globosus  
C) Nucleus emboliformis  
D) Nucleus fastigii
8. Which of the following structure passes through foramen spinosum? **(Must know)**  
A) Mandibular nerve  
B) Accessory meningeal artery  
C) Greater petrosal nerve  
D) Middle meningeal artery
9. Coronary sinus opens into **(Must know)**  
A) Superior vena cava  
B) Left atrium  
C) Right atrium  
D) Inferior vena cava

10. Muscle dividing lingual artery into three part is **(Must know)**  
 A) Hyoglossus  
 B) Mylohyoid  
 C) Genioglossus  
 D) Geniohyoid
11. The muscle supplied by the motor nucleus of Glossopharyngeal nerve **(Mayknow)**  
 A) Glossopharyngeus  
 B) Stylopharyngeus  
 C) Palatopharyngeus  
 D) Salphingopharyngeus
12. The following sinuses open into middle meatus except: **(May know)**  
 A) Frontal  
 B) Middle ethmoidal  
 C) Maxillary  
 D) Posterior ethmoidal
13. Second rib gives attachment to which of the following muscle: **(May know)**  
 A) Scalenus anterior  
 B) Scalenus medius  
 C) Scalenus posterior  
 D) Serratus anterior
14. Temporo – Mandibular joint is synovial joint, sub type **(May know)**  
 A) Hinge  
 B) Saddle  
 C) Ellipsoidal  
 D) Ball and socket
15. Muscles of the face is supplied by **(May know)**  
 A) Trigeminal nerve  
 B) Hypoglossal nerve  
 C) Vestibulo cochlear nerve  
 D) Facial nerve
16. All of the following muscles are grouped together as muscles of mastication **EXCEPT: (May know)**  
 A) Buccinator  
 B) Masseter  
 C) Temporalis  
 D) Pterygoids
17. Thoracic duct enters the thorax by passing through the **(May know)**  
 A) Venacaval opening  
 B) Aortic opening  
 C) Oesophageal opening  
 D) Space of larrey
18. The dangerous layer of the scalp is **(May know)**  
 A) Skin  
 B) Subcutaneous connective tissue  
 C) Epicranial aponeurosis  
 D) Loose areolar tissue
19. Typical inter costal nerves are anterior primary rami of **(May know)**  
 A) T1 – T4  
 B) T3 – T6  
 C) T6 – T8  
 D) T8 – T12
20. One of the content of suboccipital triangle is which part of vertebral artery? **(May know)**  
 A) Third  
 B) Second  
 C) Fourth  
 D) First

## RECOMMENDED BOOKS

1. Cunningham's Manual of practical anatomy by Romanes. G.J. 3volumes 5<sup>th</sup> Edition Oxford, 2003.
2. Human Anatomy by B.D. Chaurasia. 6<sup>th</sup> Edition CBS Publishers, 2013.
3. Human Anatomy by T.S. Ranganathan S And Chand Company, 2004.
4. Human Anatomy by I.B. Singh. Jaypee Publishers, 2004.
5. Human Anatomy by Dutta. 6<sup>th</sup> Edition Current Books, 2003.
6. Clinically Oriented Anatomy by Keith L. Moore. 7<sup>th</sup> Edition Lippincott, 2014.
7. A Textbook of Human Neuroanatomy by Inderbir Singh. 9<sup>th</sup> Edition Jaypee Publishers, 2014.
8. Atlas of Histology by Difiore's. 12<sup>th</sup> Edition Lippincott, 2012.
9. Textbook of Human Histology by Inderbir Singh. 6<sup>th</sup> Edition Jaypee Publishers, 2011.
10. Medical Embryology by Langman. 13<sup>th</sup> Edition Lippincott, 2014.
11. Human Embryology by Inderbir Singh. 10<sup>th</sup> Edition Jaypee, 2014.
12. Essential of Human Genetics by Bhatnagar, Kothari & Mehta. 4<sup>th</sup> Edition Orient Longman, 1999.

## REFERENCE BOOKS:

1. Grays Anatomy by Standring Susan. 41<sup>st</sup> Edition Churchill Livinston, 2015.
2. Clinical Anatomy by Richard Snell. 9<sup>th</sup> Edition Lippincott, 2014.
3. Clinical Neuroanatomy by Richard Snell. 7<sup>th</sup> Edition Lippincott, 2010.
4. Grant's Atlas of Anatomy by Agur anni. M. R. 13<sup>th</sup> Edition Lippincott, 2012.
5. Atlas of Human Anatomy – Sobotta 2 Volume 15<sup>th</sup> Edition Lippincott, 2011.
6. Last's Anatomy by R.J. Last. 12<sup>th</sup> Edition Churchill Livingston, 2011.
7. Surgical Anatomy by Lee Mcgregor. 12<sup>th</sup> Edition Varghese Publication, 1986.
8. Surface and Radiological Anatomy by A. Halim. 3<sup>rd</sup> Edition CBS Publishers, 2011.
9. Atlas of Human Anatomy by Frank, H. Netter. 6<sup>th</sup> Edition Saunders, 2014.

*Shall I teach you what is knowledge? When you know a thing,  
say you know it When you do not know a thing,  
admit that you do not know it. That is knowledge*

- Confucius

## HUMAN PHYSIOLOGY

### HUMAN PHYSIOLOGY INCLUDING BIOPHYSICS

#### (A) PHYSIOLOGY

##### (i) GOAL:

The broad goal of the teaching of undergraduate students in Physiology aims at providing the students comprehensive knowledge of the normal functions of the organ systems of the body to facilitate an understanding of the physiological basis of health and disease.

##### (ii) OBJECTIVES:

##### (a) KNOWLEDGE:

At the end of the course the student shall be able to:

1. Explain the normal functioning of all the organ systems and their interactions for well coordinated total body function;
2. Assess the relative contribution of each organ system to the maintenance of the milieu interior;
3. Elucidate the physiological aspects of normal growth and development;
4. Describe the physiological response and adaptation to environmental stresses;
5. List the physiological principles underlying pathogenesis and treatment of disease.

##### (b) SKILLS:

At the end of the course the student shall be able to:

1. Conduct experiments designed for the study of physiological phenomena;
2. Interpret experimental/investigative data;
3. Distinguish between normal and abnormal data derived as a result of tests which he/she has performed and observed in the laboratory.

##### (c) INTEGRATION:

At the end of the integrated teaching the student shall acquire an integrated knowledge of organ structure and function and its regulatory mechanisms.

#### (B) BIOPHYSICS

- a) **GOAL AND OBJECTIVES:** The broad goal of teaching Biophysics to undergraduate students is that they should understand basic physical principles involved in the functioning of body organs in normal and diseased conditions.

## SYLLABUS OF PHYSIOLOGY

### THEORY

- a) **Must know** (60%)
- b) **May know** (30%)
- c) **Desirable to know** (10%)

#### 1. GENERAL PHYSIOLOGY & MUSCLE

##### A) Must Know :

1. Body Water, ECF and ICF composition.
2. Cell membrane, organelles, nucleus; Intercellular connection and matrix; Transport across cell membrane; Transmembrane electrical potential.
3. Nervous tissue – Neurons and neuroglia-cell types: Myelination; Excitability-strength duration curve; Generation and propagation of nerve impulse. Synapse, Neurotransmitters, their receptors. Types of nerve fibres of somatic sensory and motor nerves.  
(a) Division of the Autonomic Nervous System – their neurons, neurotransmitters, receptors & functions.
4. Muscle: Structure innervations, excitation, contraction and relaxation of skeletal, smooth and cardiac muscle.
5. Degeneration and regeneration of nerve fibres.
6. Types of muscular contraction; preload and after load; skeletal muscle fibre types – Effect of exercise on muscles, Frank Starling's Law.

##### B) May Know :

1. Nernst equilibrium potentials, Goldman constant field equation.
2. Muco polysaccharides and protein in matrix of connective tissues.

##### C) Desirable to know:

1. Histophysiology of different types of epithelial, fibrous, adipose, cartilage and bone tissues.
2. Physical and chemical properties of water.

## **II. BLOOD AND LYMPH:**

### **A) Must Know:**

1. Blood volume, Haematocrit, Composition of plasma, Functional classification of plasma proteins.
2. Erythrocytes – Structure, count, formation, metabolism, functions, destruction.
3. Leucocytes – Classification, Functions, TLC & DLC, formation, fate; Plasma cells.
4. Thrombocytes – Structure and function, formation, count; Primary Haemostasis.
5. Coagulation of Blood, Fibrinolysin, Physiological anticoagulants; organization of clot, Role of Vit. K.
6. ABO and Rh blood groups – compatibility, prophylaxis.

### **B) May Know:**

1. Plasmapheresis; Plasma expanders; Effect of haemorrhage and IV fluids on volume, haematocrit, specific gravity and viscosity of blood.
2. Haemoglobin.
3. Haematological indices, classification of anaemia.
4. Immunity, Interleukins, Antibody and complement.
5. Purpura, Bleeding Time.
6. Coagulation defects, Clotting time, Thrombosis, Embolism, in vitro and in vivo anticoagulants.
7. Oedema, Lymphoedema, Effect of Vasomotor on lymph flow.

### **C) Desirable to know:**

1. Minor blood group systems; change in stored blood; Effect of mismatched blood transfusion.
2. Monokines, Endogenous pyrogen.
3. Spleen – Structure and functions, Histocytic system.
4. Lymph – Formation, circulation, function lymph nodes, other lymphoid tissue.

## **III. DIGESTION**

### **A) Must Know:**

1. Functional anatomy of the alimentary tract – glands, musculature, innervation and blood supply.
2. Mastication: Salivary glands and von Ebner's glands. Composition and functions of saliva, control of salivation. Deglutition.

3. Gastric motility and secretion – Control; Digestion and Absorption in the stomach; Duodenal mucosa; Vomiting.
4. Pancreatic juice – mode of secretion, composition and functions; control of secretion.
5. Functions of liver; composition of hepatic and gall bladder bile; Emptying of gall bladder; Bile salts, enterohepatic circulation.
6. Motility of Enteron; Crypts of Lieberkuhn composition and function of succus entericus. Digestion and absorption in the small intestine.
7. Function of the colon, motility, secretion, absorption; defecation; composition of faeces.

**B) May Know :**

1. Enteric Nervous System.
2. Experimental evidence for phases of gastric secretion; Psychosomatic illness; Achylia and hyperacidity; Management of peptic ulcer, Dumping syndrome.
3. Tyrsin inhibitor; Pancreastatin.
4. Choleretics, Cholagogues; gall stones; Biliary colic, Obstructive jaundice.

**C) Desirable to know:**

1. Xerostomia, Dysphagia, Achalasia cardia, Heart burn.
2. Intestinal colic, Paralytic ileus, intestinal obstruction; Diarrhoea; Malabsorption; Minor GI hormones.
3. Colitis, Megacolon, Constipation.

**IV. EXCRETION :**

**A) Must Know:**

1. Functional anatomy of kidney and urinary tract; Nephron – types, parts; Peculiarities of Renal circulation; Juxtaglomerular Apparatus.
2. Starling forces in the Malpighian corpuscle, Glomerular filtration; Plasma load, Tubular load, Plasma Clearance.
3. Reabsorption of glomerular filtrate, Proximal tubular events – Reabsorption of Bicarbonate and glucose; Transfer maximum, Renal threshold; Action of Parathromone.
4. Role of Counter current mechanism in creating and maintaining medullary osmotic gradient. Diluting segment of nephron.
5. Distal tubular events – Action of Aldosterone; Role of kidney in homeostasis of electrolyte concentration and acid base balance.
6. Urine concentrating mechanism – action of vasopressin.
7. Motility in ureters; Filling of bladder – cystometrogram; Micturition.
8. Water diuresis, Diabetes insipidus.



## **B) May Know:**

1. Skin – Functions, pigmentation, hairgrowth cycle, sweat glands; their control, sebaceous secretion, cutaneous receptors.
2. Measurement of GFR and RBF.
3. Glucose absorption curve, Heterogeneity of nephrons; glycosuria, osmotic diuresis.
4. Tubuloglomerular feedback.

## **C) Desirable to know:**

1. Artificial kidney, Dialysis.
2. Action of ANP and BNP and Adrenomedullin.
3. Uretic colic, Hydronephrosis; Types of abnormal bladder.
4. Types of hair; cutaneous circulation; cholinergic sympathetics; Alpiecia; cavities; Dendritic; Langerhans cells.

## **V. ENDOCRINE GLANDS**

### **A. Must Know:**

1. General aspects of endocrine physiology; Histology and blood supply of the glands; Biosynthesis of protein and steroid hormones, transport, location of receptors, second messengers; control of secretion – hierarchy, feed forward and feed back regulation.
2. Hormones secreted, stimuli for secretion, transport, receptors, response of target organ cells and regulation of secretion in respect of each of the following endocrine glands :
  - a. Hypothalamus.
  - b. Neruohyophysis cerebri.
  - c. Adenohypophysis cerebri.
  - d. Epiphysis cerebri.
  - e. Thyroid.
  - f. Parathyroid.
  - g. Kidney.
  - h. Heart.
  - i. Adrenal cortex.
  - j. Adrenal medulla.
  - k. Islets of Langerhans.
  - l. Gastrointestinal tract.
3. Paracrine regulators : Production, mode of action and local effects of the Kinins, Histamine, Serotonin, Eicosanoids.
4. Biosynthesis, Circadian rhythm, rate of daily secretion, half life and catabolism of the hormones; Effects of hypo and hyper-secretion of each hormone – clinical syndromes; Interaction between hormones.

### **B) May Know:**

1. Mode of activation and mode of action of second messengers.

### **C. Desirable to know:**

1. Chemistry of the autacoids.

## **VI. REPRODUCTION**

### **A. Must Know:**

1. Sexual differentiation of gonads and genitalia in utero; growth and development of the individual after birth; Puberty, Climacteric, senescence.
2. Male Sex organs, Spermatogenesis, Semen; Male sexual act, Capacitation, Fertilization.
3. Hormones secreted by testes – their actions; control of secretion.
4. Female sex organs, Oogenesis; Menstrual cycle; changes in ovary, uterus, vagina – role of hormones.
5. Female sexual act, fertilization, conception; methods of contraception.
6. Pregnancy; cause of amenorrhoea; Functions of placenta; Physiology of mother and foetus.
7. Parturition: Initiation and stages of labour; Breast development and lactation – hormonal control.
8. Determination of day of ovulation; infertility.
9. Foetoplacental unit; Immunological test for pregnancy.
10. Lactation amenorrhoea; Colostrum Vs Milk; Benefits of breast feeding.

### **B) May Know :**

1. Hermaphroditism: OX, XXY, XXX, XYY syndromes; Cryptorchidism.
2. Secretion of sertoli cells; Male sterility, Impotence.
3. Biosynthesis and catabolism of oestrogens and progesterone; Premenstrual tension; Anovulatory cycles.

### **C. Desirable to know:**

1. Biosynthesis and catabolism of androgens.

## **VII. RESPIRATION**

### **A) Must Know:**

1. Ventilation; Muscles of respiration, Boyle's law in ventilation, Mechanism, Surfactant, Compliance; Spirometric volumes and capacities.
2. Diffusion: Composition of atmospheric and alveolar air, partial pressures of gases in alveoli and blood; V/Q ratio, physiological shunt, dead space, Diffusion coefficient and capacity; Respiratory membrane.
3. Transport of O<sub>2</sub> and CO<sub>2</sub> in blood and tissue fluid, Hb-O<sub>2</sub> dissociation, Bohreffect, Haldane effect, Hamburger phenomenon.
4. Regulation – Chemoreceptors, Centres; Changes during muscular exercise.
5. Physiological effects of ascent to high altitudes – acclimatization; Dysbarism, Nitrogen narcosis.
6. Asphyxia, ARD Syndrome, liquid breathing.
7. Types of hypoxia, cyanosis, oxygen therapy; Foetal Hb.
8. Non-respiratory functions of lung.

### **B) May Know :**

1. Functional Anatomy of the thoracic cage, lungs, respiratory tract and paranasal air sinuses.
2. Airway resistance, Bronchial tone, Asthma.

### **C) Desirable to know:**

1. Diffusion in fibrosis, emphysema and pulmonary oedema.
2. Respiratory adjustments in disease states.

## **VIII. CARDIOVASCULAR SYSTEM**

### **A) Must Know:**

1. Properties of cardiac muscle and conducting tissue of the heart. Pacemaker potential. Origin and spread of cardiac impulse. Action potential in atrial and ventricular muscle – ionic basis. Nerve supply to heart – control of heart rate; sinus arrhythmia.
2. Heart as a pump – cardiac cycle – phases and events; heart sounds.
3. Electrocardiography – Principle – 12 classical leads – ECG tracing in Lead II.
4. Venous Return and Cardiac Output – Values and distribution of output – Factors affecting and regulation of output. Starling's Law of the heart – Effect of preload and after load.
5. Systemic arterial blood pressure – values, factors determining, Baroreceptors, vasomotor center – short term and long term regulation of BP.
6. Cardiovascular changes during exercise.
7. Pressure and volume changes in ventricles.
8. Haemodynamics of blood flow.

## **B) May Know:**

1. Types of blood vessels – pressure gradient in circulatory system; Arterial pulse and jugular venous pulse; Resistance to blood flow.
2. Micro circulation – Vasomotion – formation and absorption of interstitial fluid – Local regulation of blood flow.
3. Regional blood flow; coronary, cerebral, pulmonary, Splanchnic and cutaneous circulations.
4. Correlation of ECG tracing with phases of cardiac cycle and phase of action potential.
5. Energy sources of cardiac muscle; Artificial pacemaker; Effect of ions and drugs on heart.
6. Important vasodilators and vasoconstrictors.
7. Effect of gravity and posture on arterial B.P. Hypotensive shock, Hypertension.
8. Effects of high altitude, aviation and space travel on CVS.
9. Cardiac catheterization.

## **C) Desirable to know:**

1. Estimation of cardiac output; - failing heart.
2. Foetal circulation, congenital heart disease.

## **IX. CENTRAL NERVOUS SYSTEM:**

### **A) Must Know:**

1. Parts of the brain and spinal and – Morphology; Hierarchical organization of CNS.
2. Sensory receptors – Classification, morphology; Threshold stimulus, chronaxie, generator potential; Efferent control; Grouping of sensory nerve fibres; Bell-Magendie law.
3. Spinal reflexes – Reciprocal inhibition, neuronal circuitry in the cord; Muscle tone; Motor units, power of muscles.
4. Ascending tracts of spinal cord; Pathways for different modalities of somatic sensation; perception and cognition.
5. Descending tracts of spinal cord – Upper motor neurons, their pathways & lesions; Control of muscle tone and voluntary movements.
6. Brain stem – Location and function of different centres. III to XII cranial nerves, their functions.
7. Cerebral cortex – layers; connections; types of fibres in white matter, commissures; Functional map of cortex; Inter-hemispheric communications.
8. Thalamus – Nuclei, connection and function.
9. Reticular formation; Physiology of sleep and Arousal; ECG.
10. Basal Ganglia – Connections, functions.
11. Cerebellum – morphology – deep nuclei and cortex – neuronal circuitry; connections of cerebellum; Functions.

12. Hypothalamus – Nuclei, functions.
13. Limbic system – parts, connections, functions.
14. Conditioned reflexes; Attention, Learning, Memory, Speech.
15. Cerebrospinal fluid – Formation, Circulation, Functions; Intracranial tension.
16. Properties of synapses and reflexes; Laminae of Rexed.
17. Central analgesic pathway; Decerebrate rigidity.
18. Brodmann's areas; Decorticate rigidity.

**B) May Know :**

1. Disorder of sleep; Epilepsy; Effect of ions on neuronal excitability.
2. Effects of lesions in basal ganglia and related nuclei.
3. Types of tremor; Cerebellar function tests – signs of cerebellar disease.

**C) Desirable to know:**

1. Encephalization, spinal shock; Hemispheric specialization.
2. Adaptation and potentiation; Weber-Fechner Law and Miller's Law; Hyperaesthesia, Anaesthesia.
3. Apoplectic Stroke; Syndrome of Hemisection and Transection of the spinal cord.
4. Metathalamus, Epithalamus – Circadian rhythm.
5. Reward and punishment areas of brain.
6. Effects of lesions in amygdale, hippocampus, mammillary bodies.
7. Disorders of attention and learning; Aphasia and Amnesia, Senile dementia, Learning in a case of split brain syndrome.
8. Hydrocephalus; Cause of headache.

**X. SPECIAL SENSES**

**A) Must Know:**

**VISION:**

1. Functional anatomy of the eyeball and adnexa; Blinking; Lacrymation; Aqueous humour and intraocular pressure.
2. Image forming mechanism of the eye; control of the pupil and ciliary muscle; Accomodation to near vision; visual field, photoreceptors, visual pigments, transduction of light signal; Light and Dark Adaptation; Neuronal circuitry and information processing.
3. Retina – layers, photoreceptors, visual pigments, transduction of light signal; Light and Dark Adaptation; Neuronal circuitry and information processing.
4. Color vision – role of retina, tests.
5. Types of ganglion cells and optic nerve fibres; visual pathway, visual cortex; cognition of light and colour.
6. Movements of the eyeballs; types, control; stereopsis, cognition of depth.

7. External ear; Contents and functions of middle ear; Eustachian tube.
8. Inner ear; structure and function of cochlea – discrimination of pitch and loudness – Transduction of signal and excitation of auditory nerve.
9. Auditory pathway – processing at various levels; perception of sound.
10. Vestibular apparatus – Functional anatomy; Sensing of head position and movement; Transduction and sensory pathway – central connections.
11. Odorants, olfactory mucosa, nerves and bulb; pathways to new and old areas of cerebral cortex; perception of smells.
12. Lingual papillae and taste buds – stimuli – pathways of taste – perception of tastes.
13. Wald's visual cycle; Difference between peripheral and central retina; Retinal detachment.
14. Colour weakness and colour blindness – types.
15. Layers of superior colliculus and lateral geniculate body, Effect of lesions in visual pathway: Word blindness.
16. Efferent control of sense organ; Types of deafness – Tests for hearing – interpretation.

**B) May Know:**

1. Ptosis, Enophthalmos; Exophthalmos, Xenophthalmia, Corneal and conjunctival reflexes; dangers of glaucoma.
2. Spherical and chromatic aberration, Leukoma and cataract; Refractory defects and the correction; Pathway for papillary light reflexes and accommodation.
3. Impedance matching.

**C) Desirable to know:**

1. Oculokinetic nystagmus; Squint, Diplopia, Amyblyopia; Neuronal plasticity.
2. Cochlear microphonics; Audiogram, Presbycusis.
3. Vertigo after a spin, caloric test.
4. Anosmia, Parosmia; Hormonal modulation of smell perception (Exaltolide).
5. Polymorphism in taste perception (PTC); Ageusia, dysgeusia; modulation of taste (miraculin)

## UNIVERSITY EXAMINATION PATTERN

### THEORY

Papers – I & II, each 3 hrs and marks 100

Paper I – General Physiology & Muscle , Blood & Lymph, Digestion, Excretion, Endocrine glands and Reproduction.

Paper II – Respiration, Cardiovascular System, Central Nervous System, Special Senses

### PAPER – I

#### **PART – A**

Multiple Choice Questions (20 Questions)      20 x1=20 Marks

Distribution

General Physiology & Muscle      = 4 Questions

Blood & Lymph,                      = 3 Questions

Digestion                              = 3 Questions

Excretion                             = 3 Questions

Endocrine glands                   = 4 Questions

Reproduction                       = 3 Questions

**PART – B**      -    2 Essays                                      = 2 x 15 = 30 Marks

**PART – C**      -    5 Short Notes                                   = 5 x 5 = 25 Marks

**PART – D**      -    5 Short Notes / Applied                   = 5 x 5 = 25 Marks

**TOTAL = 100 MARKS**

### PAPER – II

#### **PART – A**

Multiple Choice Questions (20 Questions)      20 x1=20 Marks

Distribution

Respiration                            = 5 Questions

Cardiovascular System            = 5 Questions

Central Nervous System           = 6 Questions

Special Senses                       = 4 Questions

**PART – B**      -    2 Essays                                      = 2 x 15 = 30 Marks

**PART – C**      -    5 Short Notes                                   = 5 x 5 = 25 Marks

**PART – D**      -    5 Short Notes / Applied                   = 5 x 5 = 25 Marks

**TOTAL = 100 MARKS**

### PRACTICAL EXAMINATION

Haematology                        = 40 Marks

Clinical Physiology               = 40 Marks

Viva Voce                            = 40 Marks

**Eligibility for appear for examination**

Attendance 75 %

IA Marks 35%

**M.B.B.S DEGREE EXAMINATION  
I YEAR MBBS  
HUMAN PHYSIOLOGY PAPER- I & II**

**Time: Three hours**

**Max.Marks:100**

**Two hours and forty minutes**

**Part – A: 20 Marks**

**For Part – B, Part – C & Part – D For Part – B, Part – C & Part – D: 80 Marks**

**Answer ALL questions  
Illustrate the answer with suitable diagrams**

**PART – A (20 X 1= 20 Marks)**

**I. Multiple Choice Questions**

Must Know – 10

May Know - 10

**PART – B (2 X 15= 30 Marks)**

**II. Essay Questions**

1. (Must Know)

2. (Must Know)

**PART - C (5 X 5= 25 Marks)**

**III. Write short notes on:**

1. (Must Know)

2. (Must Know)

3. (Must Know)

4. (May know)

5. (Desirable to Know)

**PART – D (5 X 5 = 25 Marks)**

**IV. Write short notes on:**

1. (Must Know)

2. (May know)

3. (May know)

4. (May know)

5. (Desirable to know)



**MODEL QUESTION PAPER**  
**M.B.B.S DEGREE EXAMINATION**  
**I YEAR MBBS**  
**MBS15103 HUMAN PHYSIOLOGY – PAPER I**

**Time: Three hours** **Max.Marks:100**  
**Two hours and forty minutes** **Part – A: 20 Marks**  
**For Part – B, Part – C & Part – D** **For Part – B, Part – C & Part – D:80 Marks**

**Answer ALL questions**  
**Illustrate the answer with suitable diagrams**

**PART - B**

**I. ESSAY** **2 X 15 = 30 Marks**

1. Outline the biosynthesis of steroid hormones in adrenal cortex. Explain the actions of cortisol. Add a note on Cushing's syndrome. **(Must Know)**
2. Describe the innervations of urinary bladder with a neat diagram and outline the mechanism of micturation. Briefly explain automatic bladder. **(Must Know)**

**PART - C**

**II. SHORT NOTES** **5 X 5 = 25 Marks**

1. Facilitated diffusion **(Must Know)**
2. Sarcotubular system **(Must Know)**
3. Spermatogenesis. **(Must Know)**
4. Tetany **(May to Know)**
5. Functions of spleen. **(Desirable Know)**

**PART - D**

**III. SHORT NOTES** **5 X 5 = 25 Marks**

1. Contraceptive methods in female. **(Must Know)**
2. Oestrogen **(May Know)**
3. Artificial Kidney **(May Know)**
4. Movements of small intestine. **(May to Know)**
5. Mal absorption. **(Desirable to Know)**

Must Know	May Know	Desirable to Know	Total
50 Marks	20 Marks	10Marks	80 Marks

**PART – A**

**I.MULTIPLE CHOICE QUESTION**

**20 X 1 = 20 Marks**

1. The cross-bridge is a portion of **(Must Know)**
    - a. Actin
    - b. Troponin
    - c. myosin
    - d. tropomyosin
  
  2. The following are diabetogenic hormones EXCEPT **(Must Know)**
    - a. thyroxine
    - b. glucagon
    - c. parathormone
    - d. growth hormone
  
  3. The T lymphocytes are preprocessed in the **(Must Know)**
    - a. liver
    - b. bone marrow
    - c. thymus
    - d. lymph node
  
  4. The substance used to measure GFR is **(Must Know)**
    - a. urea
    - b. PAH
    - c. inulin
    - d. diodrast
  
  5. The normal tubular maximum for glucose is **(Must Know)**
    - a. 350 mg/minute
    - b. 180 mg/minute
    - c. 100 mg/minute
    - d. 125 mg/minute
  
  6. The action of aldosterone is on **(Must Know)**
    - a. the proximal convoluted tubule
    - b. the loop of Henle
    - c. the ascending limb of loop of Henle
    - d. the distal convoluted tubule
  
  7. Dwarfism is not a feature of **(Must Know)**
    - a. Turner's syndrome
    - b. IGF-I deficiency
    - c. myxoedema
    - d. growth hormone insensitivity
  
  8. The entry of glucose into skeletal muscle is mediated by **(Must Know)**
    - a. GLUT-5
    - b. GLUT-4
    - c. GLUT-2
    - d. GLUT-7
  
  9. All the following act as second messengers EXCEPT **(Must Know)**
    - a. cyclic AMP
    - b. calcium ions
    - c. magnesium ions
    - d. cyclic GMP
-

10. Maximum absorption of the short chain fatty acids produced by bacteria occurs in the **(Must Know)**  
 a. Stomach      b. duodenum      c. colon      d. jejunum
11. A patient complained of muscle weakness that disappeared on administering neostigmine. The mechanism of action **(May Know)**  
 a. It blocks the action of acetylcholine.  
 b. It interferes with the action of amine oxidases  
 c. It interferes with the action of carbonic anhydrase.  
 d. It interferes with the action of acetylcholinesterase.
12. Foetal haemoglobin is different from adult haemoglobin in **(May Know)**  
 a. having  $\gamma$  chains instead of  $\beta$  chains  
 b. having more affinity for 2,3-DPG  
 c. forming sickle cells  
 d. carrying fewer molecules of O<sub>2</sub>
13. Blood transfusion is indicated in all the following conditions EXCEPT **(May Know)**  
 a. anaemia      c. purpura  
 b. polycythemia      d. haemophilia
14. The first hormone to be discovered was **(May Know)**  
 a. gastrin      c. CCK-PZ  
 b. secretin      d. VIP
15. Which ONE of the following diuretics acts by decreasing acid secretion? **(May Know)**  
 a. an antagonist of V<sub>2</sub> receptor  
 b. mannitol  
 c. ethanol      d. a carbonic anhydrase inhibitor
16. Following the destruction of hypothalamo-hypophyseal axis, there is decreased secretion of all the following hormones EXCEPT **(May Know)**  
 a. growth hormone      c. FSH  
 b. TSH      d. prolactin
17. The majority of catecholamines are excreted in urine in the form of **(May Know)**  
 a. conjugates of glucuronic acid      c. VMA  
 b. conjugates of sulphuric acid      d. metanephrine

18. Testicular descent to the inguinal region depends on **(May Know)**
- a. FSH
  - b. MIS
  - c. dihydrotestosterone
  - d. testosterone
19. Aromatization of androgens to oestrogens in granulosa cells is stimulated by **(May Know)**
- a. FSH
  - b. LH
  - c. progesterone
  - d. GnRH
20. A Barr body is seen in the cells of **(May Know)**
- a. a normal male
  - b. a male with Down's syndrome
  - c. a normal female
  - d. a female with Turner's syndrome

**MODEL QUESTION PAPER**  
**M.B.B.S DEGREE EXAMINATION**  
**I YEAR MBBS**  
**MBS15104 HUMAN PHYSIOLOGY – PAPER II**

**Time: Three hours**

**Max.Marks:100**

**Two hours and forty minutes**

**Part – A: 20 Marks**

**For Part – B, Part – C & Part – D**

**For Part – B, Part – C & Part – D:80 Marks**

**Answer ALL questions**

**Illustrate the answer with suitable diagrams**

**PART - B**

**I. ESSAY**

**2 X 15 = 30 Marks**

1. Describe the nucleus, connections & functions of Cerebellum. Add a note on Cerebellar Function tests. **(Must Know)**
2. Define Cardiac Output. List the various factors affecting cardiac output. Explain in detail the regulation of cardiac output. **(Must Know)**

**PART - C**

**II. SHORT NOTES**

**5 X 5 = 25 Marks**

1. Alveolar Surfactant **(Must Know)**
2. Hypoxia **(Must Know)**
3. Cerebral circulation **(Must Know)**
4. Impedance matching. **(May Know)**
5. Aphasia **(Desirable to Know)**

**PART - D**

**III. SHORT NOTES**

**5 X 5 = 25 Marks**

1. Colour blindness **(Must Know)**
2. Heart Sound **(May Know)**
3. Hypertension **(May Know)**
4. Parkinson's disease **(May Know)**
5. Brown Sequard Syndrome **(Desirable to Know)**

Must Know	May Know	Desirable to Know	Total
50 Marks	20 Marks	10Marks	80 Marks

## PART – A

### I. MULTIPLE CHOICE QUESTION

20 X 1 = 20 Marks

- a. The volume of gas in the lungs at the end of a normal expiration is referred to as **(Must Know)**
    - a. residual volume
    - b. expiratory reserve volume
    - c. inspiratory reserve volume
    - d. functional residual capacity
  
  - b. The normal FEV1 / FVC is **(Must Know)**
    - a. 60%
    - b. 80%
    - c. 90%
    - d. 50%
  
  3. The channel involved during the plateau phase of a cardiac action potential is **(Must Know)**
    - a. a ligand-gated  $\text{Na}^+$  channel
    - b. a voltage-gated  $\text{Na}^+$ - $\text{K}^+$  channel
    - c. a voltage-gated  $\text{Na}^+$ - $\text{Ca}^{++}$  channel
    - d. a ligand-gated  $\text{Ca}^{++}$  channel
  
  4. The rate of conduction of cardiac impulse is highest in **(Must Know)**
    - a. the S.A node
    - b. the purkinje system
    - c. the ventricular muscle
    - d. the bundle of his
  
  5. Frank-Starling's mechanism refers to the relationship between stroke volume and **(Must Know)**
    - a. the end-diastolic volume
    - b. the heart rate
    - c. the blood pressure
    - d. the cardiac output
  
  6. The Fick's principle is used to measure **(Must Know)**
    - a. cardiac output
    - b. mean arterial pressure
    - c. stroke volume
    - d. the oxygen consumption per minute
  
  7. Lower motor neurons are present in **(Must Know)**
    - a. the spinal cord
    - b. the brain stem
    - c. the spinal cord and brainstem
    - d. the dorsal root ganglia
  
  8. Generator potential **(Must Know)**
    - a. is a graded response
    - b. can initiate a propagated potential
    - c. does not exhibit an overshoot
    - d. jumps from node to node
-

9. The major stimulant of the central chemoreceptors is **(Must Know)**
- a. O<sub>2</sub>
  - b. HCO<sub>3</sub>
  - c. CO<sub>2</sub>
  - d. H<sup>+</sup>
10. The neurotransmitter associated with Parkinson's disease is **(Must Know)**
- a. acetylcholine
  - b. dopamine
  - c. noradrenaline
  - d. substance P
11. Oxygen moves across the respiratory membrane into the pulmonary capillaries by **(May Know)**
- a. active transport
  - b. secondary active transport
  - c. simple diffusion
  - d. facilitated diffusion
12. In which ONE of the following states is the pleural pressure most negative? **(May Know)**
- a. at the beginning of inspiration
  - b. at the end of expiration
  - c. at mid-inspiration
  - d. at the end of inspiration
13. U-wave in an ECG is produced by **(May Know)**
- a. hyponatremia
  - b. hypokalemia
  - c. hypernatremia
  - d. hypercalcemia
14. Area 8 is **(May Know)**
- a. the visuo-psychic area
  - b. the area of frontal eye field
  - c. the motor speech area
  - d. the lateral geniculate body
15. Lesion of the right internal capsule results in **(May Know)**
- a. monoplegia
  - b. hemiplegia on the right side
  - c. hemiplegia on the left side
  - d. hemiparesis
16. REM sleep has the following features EXCEPT **(May Know)**
- a. slow EEG waves
  - b. flaccidity of muscles
  - c. dreaming
  - d. rapid eye movements
17. Cerebrospinal fluid is secreted by **(May Know)**
- a. the choroids plexus
  - b. the arachnoid trabeculae
  - c. the organum vasculosum
  - d. the subfornical organ

18. Inability to appreciate green colour is called **(May Know)**  
 a. deuteranopia    c. protanopia  
 b. protanomaly   d. deuteranomaly
19. Which memory is very resistant to decay? **(May Know)**  
 a. Auditory memory                                       c. Gustatory memory  
 b. Olfactory memory                                     d. Recent memory
20. Which one of the following is NOT a gustatory structure? **(May Know)**  
 a. circumvallate papilla                               c. filiform papilla  
 b. foliate papilla   d. fungiform papilla

**TEXTBOOK RECOMMENDED FOR THE MBBS**

1. Textbook of physiology by A.K. Jain, 5<sup>th</sup> Edition, Avichal Publication 2012.
2. Essentials of medical physiology by Indu Khurana Elsevier publication, 2008.
3. Concise Medical Physiology by Sujit K. Chaudhuri. 6<sup>th</sup> Edition Central Book Agency, 2004.
4. Textbook of Medical Physiology by Veena Mehta Ahuja 2<sup>nd</sup> Edition.

**REFERENCE BOOKS:**

1. Textbook of medical physiology by Guyton, 13<sup>th</sup> Edition, Elsevier publication 2015.
2. Review of Medical Physiology by Ganong, 24<sup>th</sup> Edition, Mcgraw hill, 2013.

**PRACTICAL BOOKS:**

1. Hutchinsons Clinical methods by Swash Michael, 23<sup>rd</sup> Edition Saunders publication, 2012.
2. Practical Manual by Staff Department of Physiology 3<sup>rd</sup> Edition, SRM University, 2012.

*Knowledge is a treasure, but Practice is the key to it.*  
 - Lao Tsu



## **BIOCHEMISTRY**

### **Syllabus**

#### **(i) Goal:**

The broad goal of the teaching of undergraduate students in biochemistry is to make them understand the scientific basis of the life processes at the molecular level and to orient them towards the application of the knowledge acquired in solving clinical problems.

#### **(ii) Objectives:**

##### **(a) Knowledge:**

At the end of the course, the student shall be able to:

- (1) Describe the molecular and functional organization of a cell and list its sub cellular components;
- (2) Delineate structure, function and inter-relationships of biomolecules and consequences of deviation from normal;
- (3) Summarize the fundamental aspects of enzymology and clinical application wherein regulation of enzymatic activity is altered;
- (4) Describe digestion and assimilation of nutrients and consequences of malnutrition;
- (5) Integrate the various aspects of metabolism and their regulatory pathways;
- (6) Explain the biochemical basis of inherited disorders with their associated sequelae;
- (7) Describe mechanisms involved in maintenance of body fluid and pH homeostasis;
- (8) Outline the molecular mechanisms of gene expression and regulation, the principles of genetic engineering and their application in medicine;
- (9) Summarize the molecular concept of body defences and their application in medicine;
- (10) Outline the biochemical basis of environmental health hazards, biochemical basis of cancer and carcinogenesis;
- (11) Familiarize with the principles of various conventional and specialized laboratory investigations and instrumentation analysis and interpretation of a given data;
- (12) Suggest experiments to support theoretical concepts and clinical diagnosis.

##### **(b) Skills:**

At the end of the course, the student shall be able to:

- (1) Make use of conventional techniques / instruments to perform biochemical analysis relevant to clinical screening and diagnosis;
- (2) Analyze and interpret investigative data;
- (3) Demonstrate the skills of solving scientific and clinical problems and decision making

### **(c) Integration:**

The knowledge acquired in biochemistry shall help the students to integrate molecular events with structure and function of the human body in health and disease.

## **SYLLABUS**

### **1. Cell**

Sub cellular components – Molecular and functional organization.

#### **Must know:**

Plasma membrane, sub cellular components like Mitochondria, Lysosomes.

#### **May know:**

Nucleus, Peroxisomes, Golgi apparatus.

#### **Desirable to know:**

Cytoplasm, Endoplasmic reticulum, Cytoskeleton.

### **II. Biomolecules**

#### **Introduction**

#### **a) Chemistry of carbohydrates**

##### **Must know:**

Monosaccharides, disaccharides – homo and hetero polysaccharides.

#### **b) Chemistry of Lipids**

##### **Must know:**

Classification of lipids, structure and function of phospholipids, cholesterol, Lipoproteins, Rancidity.

##### **May know:**

Fatty acids, Eicosanoids and derivatives.

#### **Desirable to know:**

Triglycerides, Test to identify purity of fat.

#### **c ) Chemistry of Proteins**

##### **Must know:**

Classification of amino acids, peptides, peptide hormones, eg. Insulin, Glucagon, parathyroid hormone, and pituitary hormones.

Plasma proteins – classification, method of separation and electrophoretic pattern of plasma proteins in health and disease

##### **May know:**

Protein structure and function.

#### **Desirable to know:**

Protein sequencing.

#### **d) Nucleic acids:**

##### **Must know:**

Nucleotides – DNA and RNA structure, nucleic acid analogs of medical importance.

#### **e) Hemoglobin**

##### **Must know:**

Structure of Haemoglobin, structural relationship with the function, Abnormal Haemoglobins – congenital and acquired.

##### **May know:**

Myoglobin.

#### **f) Vitamins**

##### **Must know:**

Vitamin A, D, C, Thiamine, Niacin, B6, Vitamin E, K, Riboflavin, Biotin, B12, Folic acid.

##### **Desirable to know:**

Pantothenic acid

#### **g) Minerals:**

##### **Must know:**

Calcium, Iron.

##### **May know:**

Phosphorus, Magnesium, Sulphur, Copper, Iodine, Fluoride, Zinc, Selenium, Chromium.

##### **Desirable to know:**

Nickel, Lithium, Molybdenum, Manganese.

### **III. Enzymes**

##### **Must know:**

Fundamental aspects of enzymology – definition, classification, factors affecting enzyme activity, enzyme inhibition, co enzymes, Isoenzymes – enzymes of clinical importance.

##### **May know:**

Mechanism of action of enzymes.

##### **Desirable to know:**

Enzyme Kinetics, Enzyme regulation.

### **IV. Nutrition**

##### **Must know:**

Nutritional requirements – RDA, SDA, Balanced diet and Vegetarianism (Dietary fibre)  
Consequences of Malnutrition - Marasmus, Kwashiorkor, over nutrition.

**May know:**

Digestion and assimilation of Nutrients  
-Carbohydrates, Proteins, Lipids, Vitamins and Minerals, Limiting amino acids.

**V. Metabolism and Regulatory pathways**

**1) Introduction to metabolism**

**Must know:**

High energy compounds  
Biological oxidation – enzyme involved in Electron Transport chain – oxidative phosphorylation-theories.

**May know:**

Emphasize the purpose of metabolism like energy production, Interconversion and synthesis of important Biomolecules etc.

**Desirable to know:**

Shuttles pathways involved in ETC.

**2) Metabolic pathways, regulation and Metabolic errors**

**a) Carbohydrate Metabolism**

**Must know:**

Glycolysis, TCA cycle, Regulation of blood glucose – diabetes mellitus – hypoglycemia – hyperglycaemia. Inborn errors of carbohydrate metabolism. Clinically important investigations pertaining to carbohydrate metabolism – reduction tests of urine, differential diagnosis for glycosuria including chromatography. Blood sugar values, glycated haemoglobin.

**May know:**

Gluconeogenesis, fructose and galactose metabolism

**Desirable to know:**

HMP pathway, Uronic acid pathway, glycogen metabolism, fructosamine.

**b) Lipid Metabolism**

**Must know:**

Fatty acid oxidation - energetics of oxidation, ketone bodies, Phospholipids, Cholesterol and its derivatives, Fatty liver lipotropic factors, Clinically important investigations pertaining to lipids and lipoproteins.

**May know:**

Prostaglandins, Apoproteins

**Desirable to know:**

Synthesis of fatty acids, metabolism of unsaturated fatty acids, Prostacyclins – Thromboxanes – Triglycerides, sphingolipids, Cholesterol biosynthesis.

**c) Protein metabolism**

**Must know:**

Urea cycle, Metabolism of Aromatic amino acids and Sulphur containing amino acids. Biologically important compounds obtained from amino acids. Clinically important investigation pertaining to protein metabolism – Total protein – albumin – globulin – AG. Ratio – Serum protein electrophoresis – Blood urea – BUN – Creatinine clearance.

**May know:**

Gamma aminobutyric acid and polyamines

**Desirable to know:**

Dynamic state of body proteins – interorgan transport of amino acids, Ammonia production – Transport and body amino acids pool – its - disposal. Metabolism of individual amino acids, Amino acid chromatography for screening inborn errors.

**d) Integration of Metabolism**

**Must know:**

Main control sites of metabolic pathways and key enzymes. Metabolic adaptation during fed state and starvation. Metabolism in Principal organs like liver, RBC, adipose tissue, muscle, kidney, heart & brain.

**e) Nucleic acid metabolism**

**Must know:**

Purine degradation – salvage pathway abnormalities of nucleic acid metabolism.

**Desirable to know:**

Purine and pyrimidine synthesis and degradation of Pyrimidines

**f) Metabolism of Haemoglobin**

**Must know:**

Heme synthesis, Heme catabolism, Porphyrrias and Bilirubin. Jaundice and investigations pertaining to these disorders.

**VI. Gene expression and regulation**

**1) Principles of Genetic Engineering and their application in Medicine.**

**Must know:**

Basics of Genetics – Chromosomal structure – arrangement of coding sequence and genetic code. Biosynthesis of proteins with posttranslational modification.

## 2) Cell Cycle

### **Must know:**

Cell cycle, DNA replication, RNA synthesis and processing, Mutation.

### **May know:**

DNA Repair Mechanisms.

## 3) Gene Expression and Regulation.

### **Must know:**

Recombinant DNA technology, PCR – Polymerase Chain Reaction, Blotting techniques.

### **May know:**

Genetic engineering techniques and their application in medicine. Restriction enzymes, Vectors genome library – DNA probes – Blot transfer techniques. Clinical application of genetic engineering.

### **Desirable to know:**

Operon concept, genetic switch – Gene rearrangement – gene and amplication - Gene protein interaction.

## VII. Inborn errors:

Biochemical basis of inherited disorders with their associated sequelae. Introduction to various types of inheritance and types of mutation defect in relation to various inherited disorders.

### a) Carbohydrates

#### **Must know:**

Glycogen storage disease, Galactosaemia, Lactose intolerance.

#### **May know:**

G6PD deficiency, Pentosuria.

#### **Desirable to know**

Fructose intolerance, fructosuria.

### b) Lipids

**Must know:** Dyslipoproteinaemias

**May know:** Disorders of Fatty Acid Oxidation

#### **Desirable to know:**

Sphingolipidosis

### c) Protein

#### **Must know:**

Urea cycle disorders, inborn errors associated with each amino acid.

### d) Heme Metabolism

#### **Must know:**

Porphyrias, hyper bilirubinemia (congenital and acquired)

## **e) Nucleic acid Metabolism**

### **Must know:**

Hyperuricaemia, Gout, LeschNyhan Syndrome

### **Desirable to know:**

Orotic Aciduria

## **f) Screening for Inborn errors of Metabolism**

### **Must know:**

Neonatal screening for and prenatal diagnosis of inborn errors of metabolism.

## **VIII. Homoeostasis:**

### **Must know:**

Mechanisms involved in the maintenance of body fluids and pH homeostasis.

Metabolism of water and electrolytes homeostasis of pH – buffer system, Role of kidneys and lungs – Acid base disorders.

### **Desirable to know:**

Bloods gas analysis and its interpretation and correlation to acid base disorders.

## **IX. Immunity**

### **Must know:**

Immunoglobulin structure, types and functions.

### **Desirable to know:**

Immunoglobulin synthesis, Antigen binding, monoclonal antibodies, Hyper and hypogammaglobulinaemia, immunodeficiency and AIDS – biochemical methods of assessing the Immunoglobulins, RIA, ELISA.

Molecular concepts of body defence and application in medicine.

## **X. Environmental Hazards and Cancer**

### **Must know:**

Tumour markers, Xenobiotics.

### **Desirable to know:**

Biochemical basis of Environmental Hazards – occupational hazards (lead, organophosphorus compounds etc.) Hazards due to modern industrialization and traffic pollution (CO).

Biochemical basis of cancer and carcinogenesis.

## **XI. Laboratory Investigations**

Principles of various conventional and specialized laboratory Investigations and instrumentation analysis and interpretation of data.

## **1. Principles of conventional and specialized lab investigation including instrumentation analysis.**

### **Must know:**

a) Conventional : manual colorimetric methods for biochemical parameters.

b) Specialized – ELISA, RIA

### **May know:**

Flame photometer

### **Desirable to know:**

Spectroscopy, automated techniques semi and random auto analyzer, Fluorimetry, Blood Gas Analyzer.

## **2. Interpretation of data**

### **Must know:**

Normal ranges of biochemical parameters – causes for deviation from normal.

## **XII. Clinical Chemistry**

### **1. Experiments to support theoretical concept and clinical diagnosis.**

#### **Must know:**

Biochemical tests to determine the functional ability of an organ – liver function tests, Renal function tests, Thyroid function tests.

#### **May know:**

#### **Desirable to know:**

Investigations pertaining to hormones – Mode of action of hormones and its function – Thyroid function test- Para thyroid function tests – Adrenal function tests.

### **2. Biochemical tests to confirm the clinical diagnosis of a diseases and their interpretation.**

#### **Must know:**

Jaundice (haemolytic, hepatic and obstructive), Diabetes mellitus, (mild, moderate and severe). Renal glycosuria, Hypo and hyper thyroidism, Myocardial infarction, Metabolic acidosis and alkalosis.

Cirrhosis of liver, Nephrotic syndrome, Alimentary glycosuria, Rickets, Hypo and hyperparathyroidism, Pancreatitis, Both uncompensated and compensated - Respiratory acidosis and Alkalosis, Acute Renal failure, Chronic renal failure.



## **BIOCHEMISTRY PRACTICAL SYLLABUS [Must Know]**

### **I Qualitative Experiments**

1. Reactions of Carbohydrates:
  - a) Reactions of Glucose
  - b) Reactions of Fructose
  - c) Identification of Unknown Carbohydrate
2. Reactions of Proteins :
  - a) Reactions of Albumin
  - b) Reactions of Casein
  - d) Identification of Unknown Protein
3. Reactions of Non-protein Nitrogenous substances:
  - a) Reactions of Urea
  - b) Reactions of Uric acid
  - c) Reactions of Creatinine
4. Identification of Unknown solution
5. Hemoglobin derivatives
6. Reactions of Abnormal constituents of Urine :
  - a) Reducing sugar and Ketone bodies
  - b) Proteins and Hemoglobin
  - c) Bile salts and Bile pigments

### **II Quantitative Experiments**

1. Estimation of Glucose by Glucose-oxidase methods.
2. Estimation of Protein by Biuret method.
3. Estimation of Creatinine by Jaffe's method.
4. Estimation of Urea by Diacetyl Monoxime method.
5. Estimation of Uric acid by Caraway's method.

### **III Spotters**

The student must identify the spotter and write some important uses of the spotter.

#### **NUTRIENTS**

1. Milk
2. Egg
3. Carrot
4. Lemon
5. Greens

#### **INSTRUMENTS**

1. pH meter
2. Centrifuge
3. Ryles tube
4. Electrophoretic apparatus

5. Chromatographic chamber
6. Urinometer
7. Lactometer

#### **CRYSTALS**

1. Maltosazone
2. Lactosazone
3. Glucosazone/Fructosazone
4. Hemin crystals

#### **REAGENTS**

1. Benedicts reagent
2. Barfoeds reagent
3. Foulgers reagent
4. Seliwanoff reagent
5. Fouchets reagent
6. Biuret reagent
7. Benedict's Uric acid Reagent

#### **CHEMICALS**

1. Sulphur powder
2. Ammonium Sulphate
3. Sodium Acetate
4. Phenylhydrazine
5. Magnesium Sulphate
6. Copper Sulphate
7.  $\alpha$  Naphthol
8. Sodium Nitroprusside
9. Ammonium Molybdate
10. N/50 Iodine
11. Silver Nitrate
12. Alakaline Sodium Hypobromite
13. Lead Acetate
14. Bromine Water

#### **STRUCTURES**

1. Structure of tRNA
2. Structure of cholesterol
3. Structure of fructose

#### **IV Charts**

1. Normal Oral Glucose Tolerance Test
2. Diabetes Mellitus
3. Diabetic Ketoacidosis
4. Starvation induced Ketoacidosis

5. Metabolic Acidosis
6. Metabolic Alkalosis
7. Respiratory Acidosis
8. Respiratory Alkalosis
9. Liver Function Test
10. Pre-Hepatic Jaundice
11. Hepatic Jaundice
12. Obstructive Jaundice
13. Renal Function Test
14. Nephrotic Syndrome
15. Renal Failure
16. Thyroid Function Test
17. Hypothyroidism
18. Hyperthyroidism
19. Rickets
20. Multiple Myeloma
21. Alkaptonuria
22. Galactosemia
23. Phenylketonuria

#### **V Demonstrations**

1. Colorimeter
2. Flame photometer
3. Urinometer
4. Lactometer
5. Electrophoresis: Normal & Abnormal patterns
6. Chromatography
7. Reaction of carbohydrates - Glucose, Fructose, Lactose.
8. Reactions of protein - Albumin, Casein
9. Reaction of Non-Protein Nitrogenous substances - Urea, Uric acid, Creatinine
10. Spectroscope - Derivatives of Hemoglobin, Hemin Crystals,
11. Normal and abnormal constituents of Urine

#### **VI Suggest investigations for a case of**

1. Jaundice
2. Diabetes mellitus
3. Acute renal failure
4. Proteinuria
5. Edema
6. Rickets
7. Myocardial infraction

8. Alkalosis
9. Acidosis
10. Glycosuria
11. Aminoaciduria
12. Hyper and Hypoparathyroidism
13. Hyper and Hypothyroidism

### **VII Calculate**

1. Albumin Globulin ratio with total protein and albumin values.
2. Calculate minute volume from 24 hour urine volume
3. Calculate Creatinine clearance with required parameters given.

### **VIII Interpret**

1. Electrophoresis patterns normal, cirrhosis liver, Nephrotic syndrome
2. OGTT - Normal and diabetes mellitus
3. Acute pancreatitis
4. Myocardial infarction
5. Acute renal failure and nephrotic syndrome
6. Acidosis, Alkalosis
7. Hypo and hyperthyroidism
8. Hypo and hyperparathyroidism
9. Rickets
10. Jaundice

## UNIVERSITY EXAMINATION PATTERN

The following topics shall be covered in each question paper.

### Paper - I

1. Molecular and functional organization
2. Chemistry, Digestion, Absorption and Metabolism of carbohydrate and Metabolic errors
3. Chemistry, Digestion, Absorption and Metabolism of lipids and Metabolic errors
4. Enzymes
5. Vitamins
6. Electron transport chain and biological oxidation
7. TCA Cycle and integration of metabolism
8. Nutrition
9. Porphyrins, Haemoglobin and Bilirubin metabolism

### Paper - II

1. Chemistry, digestion, absorption and metabolism of protein and Inborn errors of metabolism
2. Chemistry and metabolism of nucleic acids and errors of metabolism
3. Molecular biology
4. Water, Electrolytes
5. pH and its regulation
6. Cancer and Xenobiotics
7. Minerals
8. Hormones
9. Laboratory Instrumentation, investigations and interpretation.

**M.B.B.S DEGREE EXAMINATION  
I YEAR MBBS  
BIOCHEMISTRY PAPER- I & II**

**Time: Three hours**

**Max.Marks:100**

**Two hours and forty minutes**

**Part – A: 20 Marks**

**For Part – B, Part – C & Part – D For Part – B, Part – C & Part – D: 80 Marks**

**Answer ALL questions  
Illustrate the answer with suitable diagrams**

**PART – A (20 X 1= 20 Marks)**

**I. Multiple Choice Questions**

Must Know – 10

May Know - 10

**PART – B (2 X 15= 30 Marks)**

**II. Essay Questions**

1. (Must Know)

2. (Must Know)

**PART - C (5 X 5= 25 Marks)**

**III. Write short notes on:**

1. (Must Know)

2. (Must Know)

3. (Must Know)

4. (May know)

5. (Desirable to Know)

**PART – D (5 X 5 = 25 Marks)**

**IV. Write short notes on:**

1. (Must Know)

2. (May know)

3. (May know)

4. (May know)

5. (Desirable to know)

**MODEL QUESTION PAPER**  
**M.B.B.S. DEGREE EXAMINATION**  
**I YEAR MBBS**  
**MBS15105 – BIOCHEMISTRY PAPER - I**

**Time: Three hours**  
**Two hours and forty minutes**  
**For Part-B, Part-C & Part-D**

**Max Marks: 100 Marks**  
**Part – A: 20 Marks**  
**For Part-B, Part-C & Part-D: 80 Marks**

Answer all questions and Draw diagrams if necessary  
Answer each section in separate booklet.

**PART – B**

**I. Essays:** **2 x 15 = 30 Marks**

1. Describe the process of glycolysis. Explain the regulation and energetics of aerobic and anaerobic glycolysis. **[Must know]**
2. Give an account of the formation and activation of vitamin D. Mention the sources, daily requirement, biochemical functions and deficiency manifestations of vitamin D. **[Must know]**

**PART – C**

**II. Short notes on:** **5 x 5 = 25 Marks**

1. Draw and label Electron Transport Chain and its inhibitors. **[Must know]**
2. Basal Metabolic Rate. **[Must know]**
3. Structure of hemoglobin. **[Must know]**
4. Fatty acid synthase complex. **[Desirable to know]**
5. Heme synthesis. **[May know]**

**PART – D**

**III. Short notes on: (Applied Biochemistry)** **5 x 5 = 25 Marks**

1. Prostaglandins. **[May know]**
2. Fluid mosaic model of biomembrane. **[Must know]**
3. Structure of Myoglobin and its functions. **[Desirable to know]**
4. Biotin. **[May know]**
5. Competitive enzyme inhibition with examples. **[May know]**

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**PART – A (MCQ)**

**Choose the appropriate answer (20x01=20 marks)**

1. Serum alkaline phosphatase is greatly increased in **[Must know]**  
A) Hemolytic jaundice                      B) Hepatic jaundice  
C) Obstructive jaundice                    D) Congenital hyperbilirubinemia
2. The major storage form of lipid is **[Must know]**  
A) Cholesterol                                B) Triacylglycerol  
C) Sphingo lipid                                D) Phospholipid
3. The amount of glucose given for oral glucose tolerance test is **[Must know]**  
A) 25 g    B) 50 g  
C) 75 g    D) 100 g
4. Which of the following is NOT an isoenzyme of creatine kinase? **[Must know]**  
A) MM    B) BB  
C) MB    D) CB
5. The nitrogenous base in the phospholipid lecithin is **[Must know]**  
A) Choline                                        B) Inositol  
C) Ethanolamine                                D) Serine
6. All of the following are anti oxidant vitamins except **[Must know]**  
A) Vitamin A                                      B) Vitamin C  
C) Vitamin D                                      D) Vitamin E
7. Hexosaminidase A is deficient in **[Must know]**  
A) Tay-sachs disease                            B) Gaucher's disease  
C) Niemann-Pick disease                      D) Fabry's disease
8. NADPH is needed for all except **[Must know]**  
A) Fatty acid synthesis                        B) Steroid hormone synthesis  
C) ATP generation                              D) Integrity of RBC membrane
9. The rich source of Vitamin B<sub>12</sub> is **[Must know]**  
A) Carrot                                         B) Vegetable oils  
C) Liver    D) Leafy vegetables
10. Skeletal muscle and adipose tissue contain **[Must know]**  
A) GLUT 1                                         B) GLUT 2  
C) GLUT 3                                         D) GLUT 4



11. Zellweger's syndrome occurs due to the absence of **[May know]**  
A) Lysosomes                      B) Ribosomes  
C) Peroxisomes                      D) Endoplasmic reticulum
12. Which fatty acid is present in low levels in retinitis pigmentosa? **[May know]**  
A) Arachidonic acid                      B) Docosa hexaenoic acid  
C) Eicosa trienoic acid                      D) α-linolenic acid
13. Which of the following formula is used to calculate body mass index? **[May know]**  
A) Weight in kg + height in metre                      B) Weight in kg ÷ height in metre<sup>2</sup>  
C) Weight in kg x height in metre                      D) Weight in kg ÷ height in metre
14. The limiting amino acid in rice is **[May know]**  
A) Tryptophan                      B) Leucine  
C) Cysteine                      D) Lysine
15. Fructosuria is due to the deficiency of **[May know]**  
A) Fructokinase                      B) Aldolase B  
C) Aldolase A                      D) Hexokinase
16. The enzyme defective in Fructose Intolerance is **[May know]**  
A) Glucokinase                      B) Fructokinase  
C) Aldolase A                      D) Aldolase B
17. Enzymes accelerate the rate of reactions by: **[May know]**  
A) Increasing the equilibrium constant of reactions  
B) Increasing the energy of activation  
C) Decreasing the energy of activation  
D) Decreasing the free energy change of the reaction
18. Fructose-1,6-bisphosphate is present in all of the following **except**: **[May know]**  
A) Liver                      B) Kidney  
C) Striated muscle                      D) Smooth muscle
19. The limiting amino acid in pulse is: **[May know]**  
A) Leucine                      B) Lysine  
C) Methionine                      D) Tryptophan
20. Which among the following is an example of hemoglobin variant? **[May know]**  
A) Carboxy hemoglobin                      B) Sulfhemoglobin  
C) Methemoglobin                      D) Sickle cell hemoglobin

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**MODEL QUESTION PAPER**  
**M.B.B.S. DEGREE EXAMINATION**  
**I YEAR MBBS**  
**MBS15106 – BIOCHEMISTRY PAPER - II**

**Time: Three hours**  
**Two hours and forty minutes**  
**For Part-B, Part-C & Part-D**

**Max Marks: 100 Marks**  
**Part – A: 20 Marks**  
**For Part-B, Part-C & Part-D: 80 Marks**

Answer all questions and Draw diagrams if necessary  
Answer each section in separate booklet.

**PART – B**

**Essays:** **2 x 15 = 30 Marks**

1. Describe the metabolic fate of Tyrosine in the body. Add a note on disorders associated with it. **[Must know]**
2. Define Mutation. Explain different types of mutation with examples. **[Must know]**

**PART – C**

**II. Short notes on:** **5 x 5 = 25 Marks**

1. Gout – Types, causes and features. **[Must know]**
2. Secondary structure of proteins. **[Desirable to know]**
3. Name two tumor markers and mention their diagnostic significance. **[Must know]**
4. Xenobiotics. **[Must know]**
5. Metabolic acidosis and alkalosis. **[May know]**

**PART – D**

**III. Short notes on: (Applied Biochemistry)** **5 x 5 = 25 Marks**

1. Polyamines. **[May know]**
2. Limiting amino acids. **[ May know]**
3. Flame photometer. **[May know]**
4. G- Proteins. **[Desirable to know]**
5. Recombinant DNA technology. **[Must know]**

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## PART – A (MCQ)

Choose the appropriate answer (20x01=20 marks)

1. Micro minerals are those whose daily requirement is less than **[Must know]**  
A) 10 mg/day  
B) 100 mg/day  
C) 10 g/day  
D) 100 g/day
  2. Maple syrup urine disease is due to an inborn error of **[Must know]**  
A) Aromatic amino acids  
B) Sulphur containing amino acids  
C) Branched chain amino acids  
D) Hydroxy amino acids
  3. In the purine nucleus, carbon 6 is contributed by **[Must know]**  
A) Glycine  
B) Carbon dioxide  
C) Aspartate  
D) Glutamine
  4. The precursor of nitric oxide is **[Must know]**  
A) Glycine  
B) Alanine  
C) Arginine  
D) Glutamic acid
  5. Glucose tolerance is impaired in deficiency of **[Must know]**  
A) Selenium  
B) Iron  
C) Chromium  
D) Molybdenum
  6. Wound healing may be delayed when there is a deficiency of **[Must know]**  
A) Zinc  
B) Copper  
C) Cobalt  
D) Fluorine
  7. Which of the following amino acids are used in the synthesis of Creatine? **[Must know]**  
A) Arginine+Histamine+Tyrosine  
B) Arginine+Histidine+Alanine  
C) Arginine+Glycine+Methionine  
D) Glutamine+Histamine+Tyrosine
  8. Which of the following is normal serum calcium level? **[Must know]**  
A) 8 – 10 mg/dL  
B) 11 – 12 mg/dL  
C) 9 – 11 mg/dL  
D) 11.5 – 12.5 mg/dL
  9. Metabolic acidosis is seen in **[Must know]**  
A) Bronchial Asthma  
B) Severe vomiting  
C) Hysterical hyperventilation  
D) Renal failure
-

10. The element that prevents the development of dental caries is **[Must know]**  
A) Fluorine  
B) Iodine  
C) Calcium  
D) Phosphorus
11. The plasma protein present in the  $\alpha$ -2 region of Electrophoretic zone is **[May know]**  
A) Transferrin  
B) Hemopexin  
C) Haptoglobin  
D) Transcortin
12. Sanger's reagent, which is used to identify N-terminal amino acid of protein is **[May know]**  
A) 1-fluoro 2,4-dinitro benzene  
B) Phenyl isothiocyanate  
C) Ninhydrin  
D) Cyanogen bromide
13. The mushroom toxin  $\alpha$ -amanitin inhibits **[May know]**  
A) DNA polymerase I  
B) RNA polymerase I  
C) DNA polymerase II  
D) RNA polymerase II
14. Which of the following enzyme is defective in Xeroderma pigmentosum? **[May know]**  
A) DNA ligase  
B) DNA polymerase  
C) Endonuclease  
D) Exonuclease
15. Which of the following is an example of unacceptable mis-sense mutation? **[May know]**  
A) HbM  
B) HbS  
C) Hb Sydney  
D) Hb constant spring
16. A trace element having antioxidant function is **[May know]**  
A) Selenium  
B) Chromium  
C) Fluorine  
D) Molybdenum
17. Polyamines are synthesized from which one of the following **[May know]**  
A) Taurine  
B) Ornithine  
C) Tyramine  
D) Cadaverine
18. Which one of the analytical instrument is used for quantitative analysis of sodium and potassium? **[May know]**  
A) ELISA  
B) Chromatography  
C) Colorimeter  
D) Flame photometer
19. Plasmid is a circular **[May know]**  
A) Single stranded DNA  
B) Double stranded DNA  
C) Single stranded RNA  
D) Double stranded RNA

20. Upper safe limit of fluorine in water is [May know]

- A) 1 ppm  
C) 10ppm

- B) 5 ppm  
D) 20 ppm

\*\*\*\*\*

### **Biochemistry Text Books**

1. Textbook of Biochemistry by DM Vasudevan, 7<sup>th</sup> Edition, Published by Jaypee publishers, 2012.
2. Biochemistry by U. Sathyanarayanan, 4<sup>th</sup> Edition, Published by Books and Allied Publication, 2013.
3. Biochemistry by Pankaja Naik, 3<sup>th</sup> Edition, Published by Jaypee Publishers, 2010.

### **Biochemistry Reference Books**

1. Medical Biochemistry by Chatterjea.MN and Rana Shinde, 7<sup>th</sup> Edition, Published by Jaypee publishers, 2007.
2. Harper's Illustrated Biochemistry by Robert Murray K, 28<sup>th</sup> Edition, Published by McGraw Hill, 2009.

### **Biochemistry Practical Book**

1. Manual of Practical Biochemistry for Medical students by Rafi MD, 2<sup>nd</sup> Edition, Published by University Press, 2014.

### **JOURNALS**

1. Annals of Clinical Biochemistry
2. Annual Review of Biochemistry
3. Biochemical Journal
4. Clinica Chemica Acta
5. Clinical Chemistry
6. Diabetes
7. Diabetologia
8. Journal of Biological Chemistry
9. Journal of Clinical Endocrinology and Metabolism
10. Journal of Lipid Research
11. Metabolism
12. Nature
13. Trends in Biochemical Sciences
14. Kidney International

*To acquire knowledge, one must study, But to acquire wisdom, one must observe too.*  
- Marilyn Vos Savant

**SRM UNIVERSITY**  
**FACULTY OF MEDICINE**  
**BACHELOR OF MEDICINE AND BACHELOR OF SURGERY**  
**DISTRIBUTION OF MARKS WITH PASSING MINIMUM**

<b>I - PROFESSIONAL YEAR</b>				
<b>(Pre-Clinical Subjects)</b>				
Subject code	Subject title	Evaluation parameter	Passing minimum	Maximum Marks
MBS15101 (paper-I)	Anatomy	Written (2 Papers)	100	200
		Written including oral	120	240
		Practical	40	80
MBS15102 (paper-II)		Internal Assessment (Theory-40;Practical-40)	28	80
		overall	200	400
MBS15103 (paper-I)		Physiology	Written (2 Papers)	100
	Written including oral		120	240
	Practical		40	80
MBS15104 (paper-II)	Internal Assessment (Theory-40; Practical-40)		28	80
	overall		200	400
MBS15105 (paper-I)	Biochemistry		Written (2 Papers)	100
		Written including oral	120	240
		Practical	40	80
MBS15106 (paper-II)		Internal Assessment (Theory-40; Practical-40)	28	80
		overall	200	400

Marks qualifying for pass 50% in Theory

50% in Theory including Viva-Voce

50% in Practicals

35% in Internal Assessment

50% in Total Aggregate

# PHARMACOLOGY

## CURRICULUM & SYLLABUS

The curriculum has been designed as per MCI recommendations. MCI has allocated approximately 300 hours for teaching pharmacology over a period of three semesters. The theory classes would comprise of 125 hours of didactic teaching. The practical classes would comprise of 120 hours. The time allocated for the tutorials is approximately 60 hours. This will include seminars assignments and problem based learning.

### GOAL:

The goal of teaching the 2<sup>nd</sup> year undergraduate students in Pharmacology is to impart a holistic knowledge of Pharmacology and inculcate a rational and scientific basis of therapeutics.

### OBJECTIVES:

#### Knowledge:

At the end of the course, the students shall be able to know

1. The general principles of actions and effects of various drugs and their kinetics.
2. Dose related effects of drugs.
3. Indications, contraindications, interactions and adverse effects of therapeutically used drugs.
4. The concept of essential drugs, the essential drug list of our country.
5. The importance of rational drug therapy.
6. To prescribe rationally based on the efficacy, safety and cost effectiveness for a particular disease depending on both individual and community needs.
7. To prescribe drugs in special situations such as pregnancy, lactation, infancy and old age.
8. To prescribe for mass therapy under National health programmes.
9. The drugs of addiction and the management of addiction.
10. Antidotes and drugs used in common poisoning.
11. The various environmental and occupational pollutants, their effects on human health and the management.
12. The different types of biomedical waste, their potential risks and the management of health hazards caused by them.
13. The ethics and modalities in the development of new drugs and the ethics in clinical practice and animal ethics.

## **Skills:**

At the end of the course the student shall be able too Prescribe drugs for common ailments.

1. Recognize the side effects, adverse reactions and interactions of commonly used drugs.
2. Instruct patients how to use various drug delivery systems such as inhalers, nebulizers etc.
3. Calculate the dose of drugs according to age, body surface area, weight and associated diseases such as heart failure, renal and hepatic impairment.
4. Determine the rate of infusion of vital drugs such as dopamine, dobutamine, oxytocin and intravenous fluids.
5. Critically evaluate the information on common pharmaceutical preparation (drug formulations).

## **Integration:**

Simultaneous knowledge of physiology, pathology, clinical presentation and therapy of Common diseases will be imparted to the students by both horizontal and vertical Integrated teaching, seminars, group discussions and conferences.

## **SYLLABUS**

- Must know (60%)
- May know (30%)
- Desirable to know(10%)

### **I. General Pharmacology**

#### **Must Know**

Routes of drugs administration, New Drug delivery system

**Pharmacokinetics:** Drug absorption, Drug Distribution, Biotransformation, Excretion

**Pharmacodynamics:** Mechanism of drug action, receptors, Combined effects of drugs, factors modifying drugs action.

Clinical trials, New drug development

Types of adverse drug reactions: Pharmacovigilance, drug allergy, Teratogenicity

#### **May Know**

History of pharmacology, Drug intolerance

#### **Desirable to Know**

Dose response curve, Drug dosage, idiosyncrasy, photosensitivity, drug dependence, mutagenicity, drug induced diseases



## **II. ANS**

### **Must Know**

Anticholinesterases, Anticholinesterase poisoning, Anticholinergic drugs, therapeutic classification of sympathomimetics, alpha blockers, betablockers, drugs for glaucoma

### **May Know**

Muscarinic & nicotinic receptors, cholinergic agonists, alpha & beta adrenergic receptors, adrenergic neurone blockers

### **Desirable to Know**

General consideration of ANS, neurohumoral transmission, cholinergic transmission, Botulinum toxin, cholinesterases, ganglionic stimulants and blockers, adrenergic transmission

## **III. Autacoids**

### **Must Know**

Antihistaminic drugs, drugs for vertigo, drug therapy of migraine, prophylaxis of migraine, prostaglandin analogues, NSAIDs, selective COX 2 inhibitors, Antirheumatoid and Antigout drugs

### **May Know**

Autacoids, classical autacoids, histamine 1 & 2 receptors, serotonin 1 to 4 receptors, prostanoids and leukotrienes receptors.

### **Desirable to Know**

Chemistry, synthesis, storage, degradation and pathophysiological roles of histamine, serotonin, eicosanoids, PAF

## **IV. RESPIRATORY SYSTEM**

### **Must Know**

**Antitussives** : Drugs for dry cough and productive cough, expectorants, drugs for bronchial asthma

### **May Know**

Choice of treatment of bronchial asthma

### **Desirable to Know**

Omalizumab

## V. Hormones & Related Drugs

### Must Know

**Anterior pituitary:** Octreotide, Bromocriptine, Cabergoline, GnRH analogues

**Thyroid:** Actions and uses of thyroid hormones, Antithyroid drugs, Radioactive iodine, Thyroid storm, Lugol's iodine.

**Diabetes mellitus:** Types of insulin, oral antidiabetic drugs, Treatment of diabetic ketoacidosis

**Corticosteroids:** Classification of corticosteroids, distinctive features of systemic corticosteroids, inhalational steroids

**Androgens:** Anabolic steroids, antiandrogens drugs for erectile dysfunction

**Estrogens:** Tibolone, antiestrogens and SERM, aromatase inhibitors

**Progesterone:** Mifepristone

**Hormonal contraceptives:** Types of methods

**Drugs acting on uterus:** Oxytocics, methylergometrine, tocolytics.

**Drugs affecting calcium balance:** Preparations and uses of Vitamin D, Bisphosphonates

### May Know

Introduction to hormones and anterior pituitary hormones, Gonadotropins, TSH & ACTH.

Types of diabetes, Biosynthesis of corticosteroids, Glucocorticoid actions, mineralocorticoid actions, gene mediated actions of steroids, natural and synthetic testosterone, estrogen & progesterone hormone replacement therapy, male contraceptive, uses of calcium, drugs for hypercalcemia

### Desirable to Know

Chemistry, synthesis, transport and regulation of secretion, MOA, physiological roles, normal values and actions of thyroid hormones, corticosteroids, gonadal hormones (androgens, estrogen & progesterone), parathyroid hormone, Vitamin D & Calcium.

**Recent advances:** Pramlintide, Dapagliflozin, Epalrestat  
Metyrapone, aminoglutethimide, ketoconazole & trilostane  
Ulipristal

Teriparatide, Calcitonin, Denosumab, Cinacalcet

## VI. DRUGS ACTING ON PNS

### Must Know

**Skeletal Muscle relaxants:** Competitive blockers, Depolarizing blockers, dantrolene sodium, centrally acting muscle relaxants

**Local anaesthetics:** Lignocaine, Bupivacaine, techniques of local anaesthesia.

### May Know

Quinine

### Desirable to Know

Procaine, Dibucaine

## VII. CNS

### Must Know

**General anaesthetics:** classification, inhalational & intravenous drugs, complications of general anaesthesia, pre-anaesthetic medication

**Alcohol:** methanol poisoning, disulfiram, treatment of chronic alcoholism

**Sedative hypnotics:** Classification Benzodiazepines, Phenobarbitone, Thiopentone sodium, Newer nonbenzodiazepine hypnotics

**Antiepileptic Drugs:** Classification, Phenytoin, Carbamazepine, valproic acid, phenobarbitone, diazepam, status epilepticus,

**Antiparkinsonian Drugs:** Classification, Levodopa, Carbidopa, Selegiline, Entacapone, trihexiphenidyl

**Psychopharmacology:** antipsychotics & antidepressants (SSRI), antimanic drugs, anti-anxiety drugs

**Opioid analgesics:** Morphine, partial agonists & antagonists, opioid antagonists

### May Know

Pharmacokinetics of inhalational anaesthesia, pharmacological actions of ethanol, clinical uses of ethanol, stage of sleep, types of seizures, newer antiepileptics, treatment of epilepsy, amantadine, opioid receptors, endogenous opioid peptides, CNS stimulants and cognition enhancers

### Desirable to Know

Techniques of inhalation of anaesthetics, Mechanism of general anaesthesia, stages of anaesthesia, Alcoholic beverages, Acamprosate, Gaba receptor, melatonin, Ramelteon, Experimental models of epilepsy, Psychedelics

## VIII. CVS

### Must Know

ACE inhibitors, Angiotensin receptor blockers

**Drugs for heart Failure:** mortality and morbidity reducing drugs

MOA, current status, side effects and treatment of Digoxin over dose

Antianginal drugs: nitrates, calcium channel blockers & beta blockers

Adenosine, Amiodarone, Lignocaine,

Drugs for peripheral vascular disease: Pentoxifylline, Cilostazole, Drug therapy in myocardial infarction,

Antihypertensive drugs classification, treatment of hypertension, hypertensive emergencies and urgencies, hypertension in pregnancy

### May Know

Inamirinone, milrinone, cardiac glycosides, choice of Antiarrhythmic drugs for cardiac arrhythmias, dipyridamole, trimetazidine, riserpine, Guanethidine

### Desirable to Know

Plasma kinins, Digoxin F<sub>ab</sub> antibody, levosimendan, BNP, nesiritide, Ranolazine, Ivabradine,

## IX. DRUGS ACTING ON KIDNEY

### Must Know

**Diuretics:** Classification, loop diuretics, thiazides, Acetazolamide, spironolactone and mannitol

**Antidiuretics:** Vasopressin analogues, lypressin, terlipressin and desmopressin

### May Know

Relevant physiology of urine formation, vasopressin antagonists, tolvaptan

### Desirable to Know

Arginine Vasopressin-AVP, ADH receptors,

## X. DRUGS AFFECTING BLOOD AND BLOOD FORMATION

### Must Know

**Haematinics:** Iron, maturation factors, folic acid and Vitamin B12, Erythropoietin,

**coagulants:** Vitamin K, Styptics,

**Anticoagulants:** UFH heparin, LMW heparin, Fondaparinux, Warfarin.

**Fibrinolytics:** Streptokinase, rt-PA, Alteplase, tenecteplase

**Antiplatelet drugs:** Aspirin, Clopidogrel

**Dyslipidaemic drugs:** Statins, fibrates, bileacid, sequestrants and nicotinic acid,

**Plasma expanders:** Dextran, polygeline

### May Know

Intrinsic and extrinsic coagulation pathway, Direct thrombin inhibitors,

Antifibrinolytics, Dipyridamole, Ticlopidine

Characteristics & function of plasma lipoproteins, types of primary hyperlipoproteinaemias, Ezetimibe, LDL-CH lowering treatment guidelines

### Desirable to Know

**Direct factor Xa inhibitors:** Rivaroxaban

**Oral Direct Thrombin Inhibitor:** Dabigatran etexilate

Prasugrel, GpIIb-IIIa receptor inhibitors

CETP-inhibitors

## XI. GASTROINTESTINAL DRUGS

### Must Know

**Antiulcer drugs:** Proton pump inhibitors, H2 antihistamines, anticholinergics, misoprostol, antacids, sucralfate, Colloidal, Bismuth, subcitrate, antiH-pylori drugs, GERD

**Antiemetics:** Anticholinergics, Antihistaminics, D2 blockers, Prokinetic drugs and 5-HT3 blockers

**Laxatives:** Bulk forming, Stool softener, Stimulant & osmotic purgatives.

**Treatment of Diarrhoeas:** I.V & oral rehydration, probiotics in diarrhea

**Drugs for inflammatory bowel disease**

**Racecadotril**

### May Know

Emetics, Apomorphine, Ipecacuanha, adjuvant antiemetics  
Pathophysiology of diarrhea, zinc in pediatric diarrhea, antimicrobials in diarrhea  
Antimotility drugs

### Desirable to Know

**NK1 receptor antagonists:** Aprepitant  
Digestants and Gall stone dissolving drugs

## XII. ANTIMICROBIAL DRUGS

### Must Know

Classification of antimicrobials based on chemistry, MOA, Spectrum of action and source

**Problems due to antimicrobials use:** Drug resistance, Superinfection

**Choice of an antimicrobial agent, Chemoprophylaxis**

**Sulfonamides:** Cotrimoxazole

**Fluoroquinolones:** Ciprofloxacin, drugs for typhoid fever

**Beta lactam antibiotics:** Penicillin G, Cephalosporins, Monobactams & Carbapenems

**Broad spectrum antibiotics:** Tetracyclines

**Aminoglycosides:** Gentamycin

**Macrolide antibiotics:** Erythromycin, Clindamycin, Vancomycin

**Urinary antiseptics:** Regimens for the treatment of sexually transmitted diseases

**Antitubercular drugs:** firstline and secondline drugs, DOTS programme, regimens for tuberculosis, MDR & XDR-TB, corticosteroids in TB, MAC infection

**Antileprotic Drugs:** Dapsone, Clofazimine, treatment of leprosy (Regimens), Reactions in leprosy

**Antifungal Drugs:** Amphotericin B, Griseofulvin, Azoles, Terbinafine, Flucytosine

### **Antiviral Drugs:**

**Antiherpes virus drugs:** Acyclovir

**Antiinfluenza drugs:** Oseltamivir

**Antihepatitis virus:** Lamivudine, adefovir dipivoxil, tenofovir, Interferon alpha, ribavirin,

**Antiretrovirus:** NRTIs, NNRTIs, Protease inhibitors, fusion inhibitors

### **HAART**

**Antimalarial drugs:** Chloroquine, Quinine, Primaquine, artemisinin based combined therapy (ACT), Chloroquine resistant malaria,

**Antiamoebic Drugs:** Metronidazole, Diloxanide Furoate, Chloroquine,

Drugs for amoebiasis, Giardiasis and trichomoniasis

**Anthelmintic Drugs:** albendazole, pyrantel pamoate, Diethylcarbamazine, Ivermectin, Praziquantel, Treatment of neurocysticercosis

### May Know

History of chemotherapy, Combined use of antimicrobials, Chloramphenicol, linezolid, Echinocandins, other topical antifungals, Integrase inhibitor, Raltegravir, CCR5 receptor inhibitor, Maraviroc  
Drugs for leishmaniasis: Sodium stibogluconate, Amphotericin B, Miltefosine, Miscellaneous, cytotoxic drugs,

### **Desirable to Know**

Miscellaneous antibiotics, polypeptide antibiotics

Phases of cell cycle, general principles in cancer chemotherapy, some regimens in chemotherapy

## **XIII. ANTICANCER DRUGS**

### **Must Know**

**Anticancer Drugs:** Cell cycle specific and non-specific drugs, General toxicity of cytotoxic drugs, Alkylating agents, cisplatin

**Antimetabolite Drugs:** Methotrexate, 6-MP, 5-FU, Cytarabine

Vinca alkaloids, Paclitaxel, Topoisomerase-1 & 2 inhibitors, anticancer antibiotics

**Targeted drugs:** Imatinib, VEGF inhibitors, Bortezomib

**Monoclonal antibodies:** Classification

**Hormonal drugs in cancer therapy**

**Toxicity amelioration**

### **May Know**

Miscellaneous cytotoxic drugs

### **Desirable to Know**

Phases of cell cycle, general principles in cancer chemotherapy, some regimens in chemotherapy

## **XIV. MISCELLANEOUS DRUGS**

### **Must Know**

**Immunosuppressants:** Cyclosporine, Tacrolimus, Sirolimus, Mycophenolate

**Glucocorticoids:** Prednisolone and others

**Biological agents:** TNF alpha inhibitors, Muromonab CD3, Antithymocyte globulin (ATG), Anti-D immune globulin

**Immunostimulants:** Thalidomide, Levamisole, BCG vaccine

**Calcineurin inhibitors:** Cyclosporine

**Dermatopharmacology:** Anti-seborrheics

**Drugs for Psoriasis**

**Sunscreens**

**Drugs for acne, vulgaris**

**Antiseptics & disinfectants** : Phenol, Cresol, chloroxylenol, Povidone- iodine, Chlorhexidine, Cetrimide, formaldehyde, silver nitrate and silver sulfadiazine, Gentian violet, ethanol, Drugs used in scabies

**Chelating agents:** Dimercaprol (BAL), Calcium disodium edetate (EDTA), Penicillamine, Desferrioxamine

**Vitamins:** Retinoic acid, Thiamine, other fat and water soluble vitamins

**Vaccines & sera:** Killed & Live attenuated vaccines, immune globulins

**Drug Interactions:** Mechanism of drug interaction, Pharmacokinetic & Pharmacodynamic interaction

**Geriatric Pharmacology:**

**Perinatal & paediatric Pharmacology**

**May Know**

Immunosuppression in organ transplantation

Topical Steroids, boric acid

Deferiprone

**Desirable to Know**

Cell mediated and humoral immune response

Etanercept, Infliximab, Adalimumab, Anakinra, Daclizumab & Basiliximab

# **UNIVERSITY EXAMINATION PATTERN**

## **THEORY**

Paper – I & II, each 3 hrs and Marks 80

## **DISTRIBUTION OF CHAPTERS IN THE UNIVERSITY EXAMINATION**

### **Paper I**

- 1) General Pharmacology
- 2) Pharmacology of ANS, Skeletal muscle relaxants, local anaesthetics
- 3) Pharmacology of Autacoids
- 4) Pharmacology of CNS
- 5) Pharmacology of CVS
- 6) Pharmacology of Blood and Blood formation
- 7) Pharmacology of renal system

### **Paper II**

- 1) Chemotherapy of microbial diseases
- 2) Chemotherapy of malignancy
- 3) Immunopharmacology
- 4) Endocrine system
- 5) Pharmacology of respiratory system
- 6) Pharmacology of GIT
- 7) Ocular Pharmacology
- 8) Gene therapy
- 9) Miscellaneous: Drugs acting on skin and mucous membranes, toxicology, Antiseptics, Disinfectants, Ectoparasiticides, Vitamins, Enzymes in therapy, Vaccines & sera



**MBBS DEGREE Examination  
II YEAR MBBS  
PHARMACOLOGY PAPER – I & II**

**Time: 3 hours**

**Max. Marks: 80**

**PART - A (20 X 1 = 20 Marks)**

**I Multiple Choice Questions (20 Nos): (1-20)**

Must Know - 15

May Know - 05

**PART – B (10 + 20 = 30 Marks)**

**I Essay Questions (01 No) (1 x 10 = 10 Marks)**

1. Must Know

**II Short Notes (4 x 5 = 20 Marks)**

1. Must know
2. May know
3. May know
4. Desirable to know

**PART – C (10 + 20 = 30 Marks)**

**I Essay Questions (01 No) (1 x 10 = 10 Marks)**

1. Must Know

**II Short Notes (4 x 5 = 20 Marks)**

1. Must know
2. May know
3. May know
4. Desirable to know

**Marks allotted for Questions from**

1. Must Know Category = 15 MCQs + 2 Essays + 2 Short Notes = 45 marks
2. May Know Category = 5 MCQs + 4 Short Notes = 25 marks
3. Desirable to Know Category = 2 Short Notes 10 marks

**MODEL QUESTION PAPER**  
**M.B.B.S DEGREE EXAMINATION**  
**II YEAR MBBS**  
**MBS15201 PHARMACOLOGY PAPER - I**

Time: Three hours  
Theory: 2 Hours 40 minutes  
M.C.Q : 20 minutes

Maximum: 80 marks  
Theory: 60 marks  
PART – A M.C.Q : 20 marks

**Answer ALL questions.**  
**Draw suitable diagrams wherever necessary.**

**PART – B**

**I Write Essay:** (1 X 10 = 10)

1. Classify sedative hypnotics. Describe the pharmacokinetics, mechanism of action, uses & side effects of diazepam. (**Must know**)

**II Write short notes on:** (4 x 5 = 20)

1. Succinylcholine (**Must know**)
2. Histamine receptors (**May know**)
3. Ticlopidine (**May know**)
4. Photosensitivity (**Desirable to know**)

**PART – C**

**III Write Essay:** (1 X 10 = 10)

1. Classify drugs used in therapy of congestive heart failure. Describe the pharmacokinetics, mechanism of action, uses & adverse effects of furosemide. (**Must know**)

**IV Write short notes on:** (4 x 5 = 20)

1. Fibrates (**Must know**)
2. Trimetazidine (**May know**)
3. Endogenous opioid peptides (**May know**)
4. Melatonin (**Desirable to know**)

**PART – A**  
**Multiple Choice Questions**

Multiple choice questions – Choose the best and the most appropriate response -  
20 Marks

1. Acetylcholine acts on: **(Must know)**
    - a. Alpha receptor
    - b. Beta receptor
    - c. GABA receptor
    - d. Nicotinic receptor
  
  2. Identify the prodrug **(Must know)**
    - a. Paracetamol
    - b. Lisinopril
    - c. Propranolol
    - d. Sulfasalazine
  
  3. Which statement is false regarding atropine? **(Must know)**
    - a. Produce tachycardia.
    - b. Cause mydriasis.
    - c. Reduces blood pressure.
    - d. Decreases tracheo- bronchial secretions.
  
  4. Hepatotoxicity is most commonly produced by **(Must know)**
    - a. Ether.
    - b. Halothane.
    - c. Isoflurane.
    - d. Sevoflurane
  
  5. Spot the DMARD: **(Must know)**
    - a. Methotrexate
    - b. Prednisolone
    - c. Omeprazole
    - d. Diclofenac potassium
  
  6. EMLA cream is a combination of **(Must know)**
    - a. 2.5% Prilocaine + 2.5% Lidocaine.
    - b. 3% Lidocaine + 3% Procaine.
    - c. 1% Prilocaine + 1% Ropivacaine.
    - d. 2% Procaine + 2% Prilocaine.
  
  7. Regarding dantrolene the following statements are true EXCEPT **(Must know)**
    - a. Directly acting muscle relaxant.
    - b. Used in malignant hyperthermia.
    - c. Cause hepatotoxicity.
    - d. Block nicotinic receptors in the neuromuscular junction.
  
  8. Identify the Antihypertensive drug safe in pregnancy **(Must know)**
    - a. Propranolol.
    - b. Alpha methyl dopa.
    - c. Enalapril.
    - d. Thiazide diuretics.
-

9. The followings are the adverse effects of Propranolol EXCEPT (**Must know**)
- a. Cold feet
  - b. Hyperlipidemia
  - c. Sexual dysfunction in male patients
  - d. Tachycardia
10. The antidote for iron poisoning is (**Must know**)
- a. Desferrioxamine.
  - b. Penicillamine.
  - c. Obidoxime
  - d. Dimercaprol.
11. Which statement is false regarding desmopressin (**Must know**)
- a. Used in haemophilia.
  - b. Causes concentration of urine.
  - c. Drug of choice for nephrogenic diabetes insipidus.
  - d. Cause vasoconstriction of blood vessels.
12. The followings are the side effects of hydrochloro thiazide EXCEPT (**Must know**)
- a. Hypokalemia
  - b. Hypocalcemia
  - c. Hyperglycemia
  - d. Hyperuricemia
13. Identify the heparin antagonist (**Must know**)
- a. Warfarin
  - b. Streptokinase
  - c. Protamine sulphate
  - d. Phytonadione.
14. Drug of choice for acute migraine (**Must know**)
- a. Propranolol.
  - b. Flunarizine.
  - c. Sumatriptan.
  - d. Methysergide.
15. Identify the second generation H1 antihistamine (**Must know**)
- a. Chlorpheniramine.
  - b. Promethazine.
  - c. Meclizine.
  - d. Cetirizine.
16. Anakinra is (**May know**)
- a. A prostaglandin analogue.
  - b. A general anaesthetic
  - c. Interleukin-1 receptor antagonist.
  - d. An ergot alkaloid.
17. Risperidone is a/an (**May know**)
- a. Typical antipsychotics
  - b. Atypical antipsychotics
  - c. Antidepressant
  - d. Antianxiety drug
18. Spot the drug used in the treatment of Alzheimer's dementia: (**May know**)
- a. L-DOPA
  - b. Diazepam
  - c. Phenytoin
  - d. Memantine
19. Identify the anticoagulant which is a direct thrombin inhibitor: (**May know**)
- a. LMWt Heparin
  - b. Warfarin
  - c. Ximelagatran
  - d. Fondaparinux
-

20. The following are inodilators used in the treatment of congestive heart failure EXCEPT: **(May know)**

- a. Milrinone.
- b. Levosimendon
- c. Inamrinone
- d. Enalapril

**MODEL QUESTION PAPER**  
**M.B.B.S DEGREE EXAMINATION**  
**II YEAR MBBS**  
**MBS15202 PHARMACOLOGY PAPER - II**

Time: Three hours

Maximum: 80 marks

Theory: 2 hours 40 minutes

Theory: 60 marks

M.C.Q : 20 minutes

PART – A M.C.Q : 20 marks

**Answer ALL questions.**

**Draw suitable diagrams wherever necessary.**

**PART-B**

**I. Write Essay:**

**(1 X 10 = 10)**

1. Classify Glucocorticoids. Describe the pharmacokinetics, mechanism of action, uses & adverse effects & contraindications of Prednisolone. **(Must know)**

**II. Write short notes on:**

**(4 x 5 = 20)**

1. Omeprazole **(Must know)**
2. Linezolid **(May know)**
3. Hydroxyurea **(May know)**
4. Polypeptide antibiotics **(Desirable to know)**

**PART-C**

**I. Write Essay:**

**(1 X 10 = 10)**

1. Classify Cephalosporins. Describe the pharmacokinetics, mechanism of action, uses & adverse effects of Ceftriaxone. **(Must know)**

**II. Write short notes on:**

**(4 x 5 = 20)**

1. Tacrolimus **(Must know)**
2. Apomorphine **(May know)**
3. Imatinib **(May know)**
4. Omalizumab **(Desirable to know)**

**PART-A**  
**Multiple Choice Questions**

Multiple choice questions – Choose the best and the most appropriate response - 20 marks

1. Identify the 5 alpha reductase inhibitor **(Must know)**
    - a. Flutamide
    - b. Finasteride
    - c. Prazosin
    - d. Miglitol
  
  2. Topically used Non steroid anti-inflammatory drug in eye are the following **EXCEPT (Must know)**
    - a. Flurbiprofen
    - b. Diclofenac
    - c. Ketorolac
    - d. Indomethacin
  
  3. Which antithyroid drug is safe in pregnancy **(Must know)**
    - a. Radioactive iodine
    - b. Methimazole
    - c. Potassium iodide
    - d. Propylthiouracil
  
  4. Tendoachilles damage is caused by **(Must know)**
    - a. Penicillin
    - b. Gentamycin
    - c. Ciprofloxacin
    - d. Tetracycline
  
  5. The following are used in the treatment of hypercalcemia **EXCEPT (Must know)**
    - a. Bisphosphonates
    - b. Corticosteroids
    - c. Calcitriol
    - d. Furosemide
  
  6. One of the following is a somatostatin analog **(Must know)**
    - a. Nafarelin
    - b. Octreotide
    - c. Tamaoxifen
    - d. calcitonin
  
  7. Spot the aromatase inhibitor used in the treatment of cancer breast **(Must know)**
    - a. Clomiphene citrate
    - b. Letrozole
    - c. Fulvestrant
    - d. Mifepristone
  
  8. Identify the anthelmintic drug used in scabies infection **(Must know)**
    - a. Mebendazole
    - b. Praziquantel
    - c. Pyrantel pamoate
    - d. Ivermectin
  
  9. One of the following is Not a side effect of aminoglycoside antibiotics. **(Must know)**
    - a. Neuromuscular blockade
    - b. Cardiac toxicity
    - c. Ototoxicity
    - d. Nephrotoxicity
-

10. Identify the antibiotic used in mycobacterium avium complex **(Must know)**
- |                  |                   |
|------------------|-------------------|
| a. Erythromycin  | c. Clarithromycin |
| b. Roxithromycin | d. Gentamicin     |
11. Haemorrhagic cystitis is caused by **(Must know)**
- |                  |                  |
|------------------|------------------|
| a. Methotrexate. | c. Busulfan.     |
| b. Ifosfamide.   | d. Chlorambucil. |
12. The following statements regarding salbutamol are true EXCEPT **(Must know)**
- |                                 |                                     |
|---------------------------------|-------------------------------------|
| a. It is a $\beta_2$ agonist    | c. Produce bradycardia              |
| b. Cause skeletal muscle tremor | d. Useful in acute bronchial asthma |
13. Identify the mucolytic agent **(Must know)**
- |                |                     |
|----------------|---------------------|
| a. Pheniramine | c. Potassium iodide |
| b. Bromhexine  | d. Cetirizine       |
14. Antiemetic of choice in cancer chemotherapy induced vomiting is **(Must know)**
- |                |                    |
|----------------|--------------------|
| a. Domperidone | c. Hyoscine        |
| b. Ondansetron | d. Diphenhydramine |
15. Spot the laxatives used to prevent hepatic encephalopathy in patients with liver cirrhosis **(Must know)**
- |                    |              |
|--------------------|--------------|
| a. Liquid paraffin | c. Lactulose |
| b. Bisacodyl       | d. Bran      |
16. Regarding clofazimine the following statements are true EXCEPT **(May know)**
- |   |
|---|
| a. It is a leprostatic drug                       |
| b. Inhibits DNA template function in bacilli      |
| c. Not used in mycobacterium avium complex        |
| d. Cause reddish black discolouration of the skin |
17. Drug used in the treatment of inflammatory bowel disease is **(May know)**
- |                 |                    |
|-----------------|--------------------|
| a. Trimethoprim | c. Sulfasalazine   |
| b. Domperidone  | d. Desferrioxamine |
18. SERM used in the treatment of osteoporosis is: **(May know)**
- |                       |                 |
|-----------------------|-----------------|
| a. Tamoxifen          | c. Raloxifene   |
| b. Clomiphene citrate | d. Ormeloxifene |

19. Urinary antiseptic used in the treatment of UTI is: **(May know)**

- a. Nalidixic acid
- b. Norfloxacin
- c. Phenazopyridine
- d. Methanamine mandelate

20. Following are anabolic steroids except: **(May know)**

- a. Nandrolone
- b. Oxymetholone
- c. Cyclosporine
- d. Stanozolol

**DEPARTMENT OF PHARMACOLOGY  
UNIVERSITY PRACTICALS – II MBBS  
DISTRIBUTION OF MARKS FOR PRACTICAL EXAMINATION**

**PRACTICAL – I**

**TOTAL: 50 MARKS**

1. Prescription Writing 5 marks
2. Prescription Audit/CCR (criticize, correct and rewrite the prescription) - 5 marks
3. Clinical Problem solving Exercise - 5 marks
4. Dosage Calculations including pharmacoeconomic problems - 5 marks

**PRACTICAL – II**

1. Computer simulated experiment (10) /Spotters (5) /OSPE (Objective structured practical Examination (5) - 20 marks
2. Qualitative/Quantitative experimental charts - 5marks
3. Clinical Pharmacology charts - 5 marks

**ORAL (VIVA) EXAMINATION**  
**DISTRIBUTION OF TOPICS FOR THE FOUR EXAMINERS**

EXAMINER I: General Pharmacology 8 MARKS

Autonomic nervous system.  
Skeletal muscle relaxants.  
Cardiovascular system.  
Drugs acting on kidney  
Blood & blood forming organs.

EXAMINER II: Central Nervous System. 8 MARKS

Local anaesthetics.  
Autocoids.  
Respiratory system.

EXAMINER III: Chemotherapy of microbial diseases. 7 MARKS

Chemotherapy of malignancy.  
Immuno pharmacology.  
Antiseptics, disinfectants and ectoparasiticides.



EXAMINER IV: Drugs Acting On Gastro Intestinal Tract. 7 MARKS  
 Hormones and their antagonists, oculo Pharmacology and Gene therapy Miscellaneous,  
 toxicology – chelating agents.  
 Vitamins, enzymes drugs acting on skin and mucus membrane and vaccines and sera.

**Total 30 MARKS**

## INTEGRATED TEACHING

### Common Areas Integrated Teaching of Pharmacology in Collaboration with Pre, Para and Clinical Departments

<b>Topics</b>	<b>Collaborating Departments</b>
Drugs in Anaesthetic practice	Anaesthesia
	Surgery
	Ophthalmology
Drugs in Psychiatry	General medicine
	Psychiatry
	Paediatrics
Principles of rational use of drugs	Medicine
	Surgery
	Obstetrics & Gynaecology
	Paediatrics
Therapy of hypertension	Physiology
	Cardiology
	Medicine
	Pathology
	OB&G
Diabetes mellitus	Medicine Pathology
	OB&G
	Ophthalmology
	Surgery
Peptic Ulcer disease	Medicine
	Physiology
	Surgery

Congestive heart failure	Medicine
	Cardiology
Therapy of Bronchial asthma	Medicine
	TB & Chest medicine
	Paediatrics
Therapy of Malaria	Medicine
	Microbiology
	Community Medicine
Therapy of Tuberculosis	Medicine
	Microbiology
	Community Medicine
	Chest Medicine
Principles in the treatment of poisoning	Forensic Medicine
	Medicine

#### **BOOKS RECOMMENDED:**

1. Pharmacology and Pharmacotherapy by R. S. Satoskar, S.D. Bhandarkar, 23<sup>rd</sup> Edition, Popular Publication, 2013.
2. Essentials of Medical Pharmacology by K. D. Tripathi, 7<sup>th</sup> Edition, Jaypee publication, 2008
3. Clinical Pharmacology by P.N.Bennett and M.J. Brown 12<sup>th</sup> Edition, Churchill Livingstone, 2012.
4. Basic and clinical Pharmacology by Katzung, 11<sup>th</sup> Edition, Mcgraw Hill, 2009.

## REFERENCE BOOKS:

1. Pharmacology by Rang. H.P. 8<sup>th</sup> Edition, Elsevier Publication, 2015.
2. Oxford textbook of clinical pharmacology and drug therapy by Grahame Smith.D.G. 3<sup>rd</sup> Edition, Oxford publication, 2002.
3. The Pharmacological basis of Therapeutics by Goodman & Gilmans, 12<sup>th</sup> Edition, Mcgraw Hill, 2011.
4. Modern Pharmacology with clinical application by Craig Charles. R, 6<sup>th</sup> Edition, Lippincott, 2004.
5. Lippincott's illustrated reviews pharmacology by Harvey Richard, 6<sup>th</sup> Edition, Lippincott, 2011.
6. Integrated Pharmacology by Page, Clive, etal. 3<sup>rd</sup> Edition, Mosby, 2006.
7. Textbook of Pharmacology by S.D. Seth. 3<sup>rd</sup> Edition, Churchill Livingston, 2009.

*Because learning does not consist only of knowing what we must or we can do, but also of knowing what we could do and perhaps should not do*

*- Umberto Eco*

# MICROBIOLOGY CURRICULUM

## Goal

The broad goal of the teaching of undergraduate students in Microbiology is to provide an understanding of the natural history of infectious diseases in order to deal with the etiology, pathogenesis, laboratory diagnosis, treatment, control and prevention of infections in the community.

## Objectives

### Knowledge

At the end of the course the student will be able to:

- a) State the infective micro-organisms of the human body and describe the host - parasite relationship.
- b) List the pathogenic microorganisms (Bacteria, Viruses, Parasites, Fungi) and describe the pathogenesis of the diseases produced by them.
- c) State or indicate the modes of transmission of pathogenic and opportunistic organisms and their sources including insect vectors responsible for transmission of infection.
- d) Describe the mechanisms of immunity to infections.
- e) Acquire knowledge on suitable antimicrobial agents for treatment of infections and scope of immuno therapy and different vaccines available for prevention of communicable diseases.
- f) Apply methods of disinfection and sterilization to control and prevent hospital and community acquired infections.
- g) Recommend laboratory investigations regarding bacteriological examination of food, water, milk, and air.

## **Skills**

At the end of the course the student will be able to: o Operate and use the light compound microscope.

- To employ aseptic and sterile precautions while performing simple invasive procedures such as venepuncture etc.
- Collect and transport appropriate clinical materials with necessary precautions for the laboratory diagnosis of infectious diseases.
- To perform common laboratory techniques (as given below) for the direct demonstration of micro-organisms from clinical materials and interpret their findings.
- Wet preparation for *Trichomonas vaginalis*.
- KOH preparation for the identification of fungal elements.
- Saline and iodine preparations and concentration methods for parasites and demonstration of trophozoites, ova or cysts in stool samples.
- Prepare and stain peripheral blood for screening malarial parasites and microfilariae.
- Prepare a smear and perform Gram stain on body fluids, urine and pus specimens.
- Prepare a smear and perform Ziehl – Nielsen stain for demonstration of *Mycobacteria* especially from sputum.
- Perform and interpret cold staining techniques on skin smear for demonstration of *M. leprae*.
- Interpret results of microbiological tests including antimicrobial testing for the diagnosis of common infectious diseases.
  
- To perform and interpret a skin test.
- Perform simple standard rapid tests for diagnosis of infectious diseases.
- To organize the safe handling and disposal of infectious waste.

## **Integration**

The student will have integrated knowledge of Infectious diseases - pathogenicity, clinical features, immunological features, laboratory diagnosis, epidemiology and control of diseases in the community by proper immunization procedures. This will be achieved through integrated teaching involving other non clinical and clinical departments.

## SYLLABUS GENERAL BACTERIOLOGY

### **MUST KNOW**

#### HISTORICAL INTRODUCTION-

Contributions of various scientists to microbiology

#### MICROSCOPY-

The light microscope.

#### STAINING OF BACTERIA-

Gram staining, Acid fast staining, Hanging drop

#### BACTERIAL MORPHOLOGY -

Shape & arrangement of bacteria: structure of bacterial cell CULTURE

#### MEDIA & CULTIVATION METHODS –

Basic requirements of culture media, Types of media; Aerobic & anaerobic culture methods

#### IDENTIFICATION OF BACTERIA –

Morphology, Wet mount preparation (Hanging drop)

Staining methods, culture characteristics, Biochemical reactions- principle, procedure, positive & negative reaction with examples

#### CLASSIFICATION OF BACTERIA-

Based on shape, arrangements, staining techniques

#### BACTERIAL GENETICS –

Basic principles of molecular biology & bacterial DNA, Extra chromosomal genetic elements- Plasmids, Genotypic & phenotypic variation, Mutation, Mechanism of gene transfer and drug resistance, Transduction, conjugation.

#### STERILIZATION & DISINFECTION –

Definitions, Classification, Applications of heat : Above 100°C- hot air oven and autoclave, Below 100°C: At 100°C: Sterilization control, , Factors affecting potency of disinfection, Sterilization in healthcare setting

### **MAY KNOW**

MICROSCOPY- Dark ground microscope, Phase contrast microscope, Electron microscope, Fluorescent microscope

STAINING OF BACTERIA-Albert's stain, Capsular staining, Negative staining

BACTERIAL MORPHOLOGY – pleomorphism, involution form, L-forms of bacteria

BACTERIAL PHYSIOLOGY –Bacterial metabolism, Nutrition & growth of bacteria, Bacterial growth curve

STERILIZATION & DISINFECTION- Cold sterilization , Testing of disinfectants

## **DESIRABLE TO KNOW**

**BACTERIAL GENETICS** - Genetic engineering, Restriction enzymes, Molecular blotting techniques, DNA Probe, PCR, genetic mapping  
**STERILIZATION & DISINFECTION**- Characteristics of ideal disinfectant, Testing of disinfectants

## **IMMUNOLOGY**

### **MUST KNOW**

**INFECTION**-Definitions, Classification of infections, sources of infection, methods of transmission of infection, Types of infectious diseases.

**IMMUNITY**- Types of immunity, innate, Adaptive immunity. vaccines

**ANTIGENS**- Definitions, Types of antigens,

**ANTIBODIES – IMMUNOGLOBULINS**- Introduction, antibody structure, classes of immunoglobulins and functions of immunoglobulins

**ANTIGEN – ANTIBODY REACTIONS**-Types of ag-ab reactions, Precipitation Reactions Agglutination reactions: slide agglutination-tube agglutination-heterophile agglutination-Coomb's test, haemagglutination, latex agglutination.

Enzyme immune Assay, ELISA, Chemiluminescence immune assay(CLIA),

**COMPLEMENT SYSTEM**- General properties, Components, Complement Activation-pathways: classical-alternative-lectin complement pathway.

**STRUCTURE AND FUNCTIONS OF IMMUNE SYSTEM**-The lymphoid system: central lymphoid organs, thymus, bone marrow, peripheral lymphoid organs: lymph nodes, spleen, MALT, BALT, cells of lympho reticular system, lymphocytes, difference between T and B lymphocytes-types of Tcells, null cells, Phagocytic cells, neutrophils, antigen presenting cells,

**IMMUNE RESPONSE**- Types of immune response: humoral immunity-cell mediated immunity, primary and secondary immune response-fate of antigen in tissues-production of antibodies-factors influencing antibody production, Cellular immune response-induction of cell mediated immunity-cytokines, interferons.

**HYPERSENSITIVITY**-Classification of hyper sensitivity reactions-Type I reactions: anaphylaxis-atopy, Type II reactions, Type III reactions: Arthus reaction-serum sickness, Type IV reactions: tuberculin type-contact dermatitis type-type V reactions.

**AUTO IMMUNITY**- Classification of auto immune diseases.

Transplantation and tumour immunology- Classification of transplants-types of grafts, graft versus host reaction

**IMMUNOHEMATOLOGY**- ABO blood group system-Rh blood group system  
Coomb's reaction-hemolytic disease of the new born

### **MAY KNOW**

INFECTION: toxigenicity –exo and endo toxins

ANTIGENS-Determinants of antigenicity: chemical nature-susceptibility to tissue enzymes-foreignness-antigenic specificity: species specificity-iso-auto-organ specificity-heterogenic specificity-Forsmann antigen.

ANTIBODIES-IMMUNOGLOBULINS-Immunoglobulin specificities/ antigen determinants: isotype-allotype-idiotype

ANTIGEN- ANTIBODY REACTIONS-Three stages of antigen, antibody reactions, sensitivity, specificity, complement fixation test, Neutralization, opsonisation, Immunofluorescence, Immuno blot techniques, immunochromatographic tests, Immuno histochemical technique.

STRUCTURE AND FUNCTIONS OF IMMUNE SYSTEM- Dendritic cells, Major histocompatibility complex-MHC restriction, Immune surveillance.

IMMUNE RESPONSE- Monoclonal antibodies

IMMUNODEFICIENCY DISEASES - Primary and secondary immune deficiency diseases, Classification of primary immune deficiency syndrome, Combined immune deficiencies.

AUTO IMMUNITY- Mechanism and pathogenesis of auto immunity.

TRANSPLANTATION AND TUMOUR IMMUNOLOGY- Allograft rejection, Immunology of malignancy,

IMMUNOHEMATOLOGY-Detection of Rh antibodies

### **DESIRABLE TO KNOW**

INFECTION- factors predisposing to microbial pathogenicity: virulence, adhesion, invasiveness, antiphagocytic factors,

ANTIGENS- Epitopes: sequential or linear, conformational. Biological classes of antigens: T cell dependent antigens, T cell independent antigens, super antigens.

ANTIGEN – ANTIBODY REACTIONS - radio immuno assay, immune electron microscopic tests, flow cytometry, coagglutination.

COMPLEMENT SYSTEM- Biological effects of complement, Regulation of complement activation

STRUCTURE AND FUNCTIONS OF IMMUNE SYSTEM - T cell maturation, B cell maturation, Natural killer cells,

IMMUNE RESPONSE - Immunological tolerance

HYPERSENSITIVITY-Cutaneous basophil hypersensitivity, Schwartzman reaction, Waterhouse- Friderichsen syndrome.

IMMUNODEFICIENCY DISEASES –Disorders of complement, Disorders of phagocytosis

TRANSPLANTATION AND TUMOUR IMMUNOLOGY- Tumour antigens



## SYSTEMATIC BACTERIOLOGY

### **MUST KNOW**

**STAPHYLOCOCCUS**- *S.aureus*- morphology, culture ,biochemical reactions, Virulence factors , Enzyme and Toxins produced, TSST, SSSS,Staphylococcal diseases, Laboratory diagnosis, coagulase test,

**STREPTOCOCCUS** - Classification of Streptococci, Lancefield ,grouping ,morphology, culture, *Streptococcus pyogenes*, antigenic structure, toxins and enzymes produced, Virulence factors pathogenesis –suppurative and Non suppurative complications.Laboratory diagnosis, ASO, Prophylaxis.

**PNEUMOCOCCUS** -Morphology, culture, biochemical reaction, antigenic property,Toxins, pathogenesis, CRP, Laboratory diagnosis.

**NEISSERIA-N.gonorrhoea**morphology, culture,biochemical reactions.Virulence factors,Laboratory diagnosis.

**CORYNEBACTERIUM**-Morphology, Culture and biochemical reactions, Toxins, Pathogenicity, laboratory diagnosis, ,Prophylaxis and treatment.

**BACILLUS***Bacillus anthracis*–History, morphology,culture, resistance. pathogenicity- virulence factors. Anthrax, Zoonosis, Epidemiology,Clinical feature, Laboratory diagnosis.

**CLOSTRIDIUM** – Classification of Clostridia..*C.perfringens*, Anaerobic myositis.(Gas gangrene) Prophylaxis and immunization *Cl .tetani* , Tetanus , laboratory diagnosis, treatment, Prophylaxis, Theatre sterilization.

**ENTEROBACTERIACEAE** – Introduction Classification-Lactose fermenters and Non Lactose fermenters*Escherichia coli*, Pathogenesis and clinical manifestation,EPEC,ETEC, EIEC,EHECKLEBSIELLA*sp.* morphology,culture,biochemical reactions,pathogenicity,lab diagnosis

**PROTEUS**: Morphology,culture,biochemical reactions,lab diagnosis,treatment

**SHIGELLA**- Classification ,Morphology, culture ,biochemical reactions, pathogenicity, Bacillary dysentery , laboratory diagnosis, Treatment.

**SALMONELLA**- *Salmonella typhi*, Enteric fever pathogenesis, laboratory diagnosis,Vaccines**VIBRIO**-*Vibrio cholerae* Morphology culture, holding or transport media enrichment media Plating Media, Gardner and Venkatraman classification, Cholera, pathogenesis , Toxins, Laboratory diagnosis

**PSEUDOMONAS**- *Pseudomonas aeruginosa*-Morphology,culture and biochemical reactions. Pathogenesis, laboratory diagnosis and treatment

**YERSINIA,PASTEURELLA,FRANCISELLA** -Plague (Morphology, Clinical features, cultural characters) epidemiology.

**HAEMOPHILUS**- Infections due to Haemophilus influenzae, pathogenesis

**BORDETELLA**- *B.pertussis* (Morphology, Pathogenesis, Clinical features,Lab diagnosis) DPT VACCINE,BRUCELLA Morphology, Clinical features , laboratory diagnosis of rucellosis, castaneda method of blood culture, serological tests for the diagnosis of brucellosis .

**MYCOBACTERIUM TUBERCULOSIS** – Classification ,clinical features, pathogenesis laboratory diagnosis of pumonary tuberculosis, BCG vaccine,Mantoux test, extrapulmonary tuberculosis, acid fast staining, technique, modifications

MYCOBACTERIUM LEPRAE- Morphology, staining techniques laboratory diagnosis of leprosy  
SPIROCHETES I.TREPONEMA – Classification of treponemes, syphilis:Morphology , laboratory diagnosis of syphilis, VDRL, RPR ,biological false positive reactions,  
II. LEPTO SPIRA - Leptospirosis infections, Weil's disease , laboratory diagnosis of leptospirosis.

## **MAY KNOW**

**STAPHYLOCOCCUS-** Penicillin resistance, coagulase negative staphylococcus(CONS), MRSA,  
**STREPTOCOCCUS-** Group B streptococcus, Group D streptococci, viridans group, CAMP reaction, Scarlet fever  
**PNEUMOCOCCUS-**Animal pathogenicity, Quellung reaction,  
**NEISSERIA-N.meningitidis,** morphology, culture, biochemical reactions.Virulence factors,Antigenic properties, Laboratory diagnosis, Ophthalmia neonatorum, Non –gonococcal urethritis  
**CORYNEBACTERIUM-**Volutin granules, Loeffler's serum slope, Animal inoculation, Diphtheroids, Elek's test  
**CLOSTRIDIUM-Naegler-** reaction, C.botulinum-morphology,toxins,pathogenesis- Botulism -laboratory diagnosis,treatment , Pseudomembranous colitis, Clostridium difficile  
**NON – SPORING ANAEROBES-** Bacterial vaginosis, Normal Anaerobic flora, Puerperal sepsis, Bacteroides, Common Anaerobic infections and bacteria  
**ENTEROBACTERIACEAE-**Enterobacter, Citrobacter, Serratia  
**SALMONELLA-**Diagnosis of carriers, Salmonella Septicemia  
**VIBRIO-**Biochemical reactions, cholera red reaction Prophylaxis and treatment vaccines  
**YERSINIA, PASTEURILLA, FRANCISELLA-** Virulence factors of Yersinia pestis, laboratory diagnosis  
**HAEMOPHILUS-Koch-Week's bacillus,** lab diagnosis, satellitism , Hib vaccine  
**BORDETELLA-**Diagnosis of pertussis, cough plate method  
**BRUCELLA-**Synonyms of brucellosis , milk ring test, vaccines for brucellosis  
**MYCOBACTERIUM TUBERCULOSIS-** MDR-TB,XDR -TB ,DOTS  
**MYCOBACTERIUM NON –TUBERCULOUS MYCOBACTERIA** - Synonyms of NTM ,Runyoun's classification, infections caused by NTM.  
**MYCOBACTERIUM LEPRAE-** Ridley & Jopling classification ,WHO classification,lepra reactions  
**SPIROCHETES-**Lyme 's disease , vincent's angina  
**MYCOPLASMA-**Primary atypical pneumonia, PPLO, cold agglutination test, L form (morphology of bacteria)  
**ACTINOMYCES-**Classification& laboratory diagnosis of actinomycosis, sulphur granule, mycetoma.  
**MISCELLANEOUS BACTERIA-** Donovanosis (or) Granuloma inguinale, Helicobacter pylori.  
**RICKETSIACEAE-**Classification, pathogenesis & clinical features laboratory diagnosis of rickettsial infections, Weil –Felix reaction.

CHLAMYDIAE-Classification ,life cycle ,infections laboratory diagnosis , LGV ,NGU,inclusion conjunctivitis,TRIC agents,trachoma.

### **DESIRABLE TO KNOW**

**STAPHYLOCOCCUS-** Bacteriophage typing, Superantigens, VRSA, VISA, Control of hospital acquired MRSA infection

**STREPTOCOCCUS** -Optochin sensitivity,Pneumococcal, vaccine

**NEISSERIA-PPNG**-Penicillinase producing N.gonorrhoeae, Reiter's syndrome

**BACILLUS-PLET** medium, Bacillus cereus.Anthracid, difference between Anthrax and Anthracoid, Prophylaxis and treatment

**NON – SPORING ANAEROBES** - Vincent's Angina

**SALMONELLA**-Salmonella gastroenteritis-Food poisoning

**VIBRI**-Halophilic vibrios, - Epidemiology

**PSEUDOMONAS-** Stenotrophomonas maltophilia, Burkholderia cepacia

**YERSINIA,PASTEURELLA ,FRANCISELLA-** Diseases due to yersinia species  
F.tularensis,P. multocida

**HAEMOPHILUS**-Chancroid , haeck group of bacteria

**BORDETELLA**-Virulence factors of B. pertussis, acellular pertussis,vaccine

**MYCOBACTERIUM TUBERCULOSIS-** DST (antitubercular drug susceptibility testing ,grading of a smear RNTCP grading - light & fluorescent microscopy, advances in TB diagnostics.

**MYCOBACTERIUM NON –TUBERCULOUS MYCOBACTERIA-** Buruli's ulcer, swimming pool granuloma

**MYCOBACTERIUM LEPRAE**-Immunity in leprosy , grading of smear,Morphological index(MI), bacteriological index (BI)

**SPIROCHETES**-Nonvenereal treponemes

**MYCOPLASMA**-Laboratory diagnosis of mycoplasma pneumoniae

**ACTINOMYCETES**-Nocardia species, laboratory,diagnosis

**MISCELLANEOUS BACTERIA**-Campylobacter sp, bacterial vaginosis (or) Gardnerella vaginalis, rat bite fever, Legionnaire's disease, Pontiac fever.

**RICKETTSIAEAE**-Brill-Zinsser disease (or) recrudescence typhus, epidemic (or) louse borne typhus,Q-fever , cat scratch disease, endemic (or) murine typhus ,scrub typhus (Chigger borne typhus ),trench fever Rocky mountain spotted fever.

**CHLAMYDIAE** -Psittacosis

## **MYCOLOGY**

### **MUST KNOW**

#### **INTRODUCTION:**

General characteristics & classification of fungi - Difference between fungi and bacteria different types of Classification

**LABORATORY DIAGNOSIS-** Direct microscopy, KOH mount, LPCB , Gram stain, Culture media

**CLASSIFICATION OF FUNGAL DISEASES**-Superficial Mycoses ,Surface infection, Tinea Versicolor, Tinea Nigra,Piedra, Cutaneous infection,

Dermatophytes, subcutaneous infection: Mycetema: cryptococcosis , opportunistic mycosis : candidiasis, aspergillosis, zygomycosis  
OTHER INFECTIONS-Otomycosis, Keratomycosis

### **MAYKNOW:**

INTRODUCTION: Reproduction – sexual, asexual

LABORATORY DIAGNOSIS-Collection and Transport of clinical Samples

CLASSIFICATION OF FUNGAL DISEASES-Blastomycosis, Histoplasmosis, Pneumocystis Jirovecii

OTHER INFECTIONS-Mycotic Poisoning

### **DESIRABLE TO KNOW**

LABORATORY DIAGNOSIS-Special Staining

CLASSIFICATION OF FUNGAL DISEASES-Paracoccidioidomycosis, Coccidioidomycosis, chromoblastomycosis, sporotrichosis, penicilliosis.

OTHER INFECTIONS-Mycetism

## **PROTOZOOLOGY**

### **MUST KNOW**

ENTAMOEBIA: Entamoeba histolytica- Morphology, Lifecycle, Intestinal amoebiasis, Extra-intestinal Amoebiasis, Lab diagnosis, Differences between E. histolytica and E. coli

Giardia lamblia-Morphology, Life cycle, Clinical features, Entero test, Lab diagnosis

Trichomonas vaginalis- Morphology, Life cycle, pathogenesis, lab diagnosis

LEISHMANIA-Classification, L. donovani, Morphology, Lifecycle, Lab diagnosis

SPOOROZOA-PLASMODIUM, P. vivax, P. falciparum, P. malariae, P. ovale  
Morphology, Human cycle, Mosquito cycle, Cerebral malaria, Black water Fever, Lab diagnosis, Differentiating features of 4 species of plasmodium, Mosquito control measure, Epidemiology

### **MAY KNOW**

PATHOGENIC FREE LIVING AMOEBAE-Nagleria, acanthamoeba

Balantidium coli-Morphology, life cycle, clinical features Lab diagnosis

LEISHMANIA-PKDL Visceral leishmaniasis, NNN medium, Leishmanin test

TRYPANOSOMES- T. brucei, Morphology, subspecies, Lifecycle, Sleeping Sickness, Lab diagnosis, T. cruzi, Lifecycle Chagas' disease, Lab diagnosis,

### **DESIRABLE TO KNOW**

ACANTHAMOEBA-Balamuthia mandrillaris OTHER ENTAMOEBIA, Dientamoeba fragilis, E. hartmanni, Endolimax nana, Iodamoeba

Giardia lamblia - Trichomonas hominis

Trichomonas vaginalis - Trichomoniasis, Lab diagnosis.

ORAL FLAGELLATE - Trichomonas tenax

LEISHMANIA - L. brazillensis, Espundia

SPOOROZOA - drug resistance in malaria

OTHER SPOOROZOA - cyclospora, microsporida

## HELMINTHOLOGY

### MUST KNOW

HELMINTHES-Introduction, General features of helminthes, Classification – Platyhelminthes; Nematelminthes, Larval forms ofhelminthes.Differentialcharacters- cestodes trematodes and nematodes

### PLATYHELMINTHES

CYCLOPHYLLIDEAN CESTODES- Taenia saginata, Taenia solium, E.granulosus-Introduction, Morphology (Adultworm, Egg,Larval stage), Life cycle (definitive, Intermediate host, mode of infection, hydatid cyst, clinical features. Hymenolipis nana- Introduction, Morphology (Adultworm, Egg.), Life cycle pathogenesis, Laboratory diagnosis, Treatment & prophylaxis

HEPATIC TREMATODS-Fasciola hepatica

NEMATODES-Ascarislumbricoides, hook worms,Enterobius vermicularis , NIH Swabs, Trichuris trichiura, Strongyloides stercoralis

TISSUE NEMATODE-Wuchereria bancrafti, Loa loa

### MAY KNOW

PSEUDOPHYLLIDEAN CESTODES-Introduction, Morphology (scolex, neck, strobila),

CYCLOPHYLLIDEAN CESTODES-Difference between Taenia saginata&T soliumE.granulosus: morphology,life cycle. Laboratory diagnosis (Casoni,s skin test, serological test, Radiological examination, Histological examination), Treatment & prophylaxis

BLOOD TREMATODES-S.heamatobium, S.mansoni, S.japonicum

LUNG TREMATODES-Paragonimus

INTESTINAL NEMATODES-Larva migrans,Trichinella spiralis,

TISSUE / SOMATIC NEMATODES -Classification -Sheathed & Unsheathed microfilariae

OTHER NEMATODES-Dracunculus medinensis

### DESIRABLE TO KNOW

PSEUDOPHYLLIDEAN CESTODES - Diphyllbothrium latum

E.granulosus - Examination of cyst fluid, Antigen detection.

H.diminuta - Morphology, lab diagnosis

Hook worms - Difference between A.duodenale&

N.americanus

Onchocerca volvulus - Serological tests, PCR.

SEROUS CAVITY FILARISIS - Mansonella ,M.ozzardi, M.perstans

## VIROLOGY

### MUST KNOW

GENERAL PROPERTIES OF VIRUSES- Definition – viruses, virion, prion, Difference between viruses & bacteria, Symmetry of viruses. Replication of virus, CPE, inclusion bodies, Classification of virus (RNA & DNA viruses), Cultivation of virus, Detection of viral growth on cell

VIRUS – HOST INTERACTIONS-Routes of entry of viruses,pathogenesis of viral infections,Inclusion bodies, lhost response to virus infections, interferons and its types, laboratory diagnosis of viral infections,immune prophylaxis-Viral vaccines-Killed, live & subunit,cultures.

BACTERIOPHAGE: structure ,life cycle and importance

POX VIRUSES - Classification of pox viruses, Small pox, Small pox vaccine, Vaccinia virus

HERPES VIRUSES- Classification, General properties, Pathogenicity of HSV 1& HSV 2, Varicella – Zoster.

ADENOVIRUSES- Classification General features, Symmetry, Infections produced by adenoviruses

PICORNA VIRUSES-Classification- Enteroviruses – Poliovirus, Pathogenesis, & lab diagnosis of polio, Prophylaxis of polio, Difference between sabin & salk vaccine

ORTHOMYXO VIRUSES -General properties, Difference between ortho and paramyxoviruses, Morphology, Antigenic drift & shift, Pathogenesis & lab diagnosis of influenza virus, Prophylaxis of influenza, Swine flu – lab diagnosis, treatment & prevention.

PARAMYXO VIRUSESGeneral properties, Mumps virus – Pathogenesis, clinical features &lab diagnosis Measles virus – pathogenesis & lab diagnosis MMR vaccine

ARBOVIRUSES- General properties, Classification – group A arboviruses, group B arboviruses, Mosquito & tick borne groups, Bunyaviridae ,Orbivirus & Vesiculovirus,Arboviral infections prevalent in India, Dengue – pathogenesis &lab diagnosis, Chickungunya – pathogenesis& lab diagnosis, Viral Hemorrhagic fever RHABDOVIRUSES - Rabies virus – morphology, pathogenesis &lab diagnosis, Negri bodies, Prophylaxis of rabies(pre &post exposure)

HEPATITIS VIRUSES- Classification- HAV, HBV, HCV, HDV, HEV &HGV, Morphology of HBV, Infectious hepatitis (A&E), Serum hepatitis (B,C,D,G), Antigenic structure of HBV, Serological markers of HBV, Pathogenesis & lab diagnosis , HBV vaccine, Recombinant HBV vaccine, Hepatitis E virus..

HUMAN IMMUNO DEFICIENCY VIRUSES (HIV) - Discovery & nomenclature, Structure, Pathogenesis & lab diagnosis of HIV, CDC classification of HIV (strategies), Prevention of HIV,

MISCELLANEOUS VIRUSES - Diarrhoea causing viruses – rotavirus, Human papilloma virus (HPV), papova viruses, Parvovirus Rubella virus, infections of HIV, Western blot, Antigenic structure of HIV,opportunistic infections

## **MAY KNOW**

GENERAL PROPERTIES OF VIRUSES-Genetics of Viruses

POX VIRUSES-Molluscum contagiosum,Orf virus

HERPES VIRUSES- HHV6, HHV7, HHV8, Epstein bar virus Infectious mono nucleosis

PICORNAVIRUSES- Rhinoviruses

ORTHOMYXO VIRUSES -Haemagglutination in influenza PARAMYXO VIRUSES - Complications of mumps, Corona virusesvirus

ARBOVIRUSES-West Nile virus, Japanese B encephalitis virus & its vaccine , yellow fever & its vaccine, Kyasanur forest diseases.Hanta virus .

RHABDOVIRUSES-Cultivation of rabies virus, Difference between street& fixed virus

ONCOGENIC VIRUSES- Definition, List of oncogenic viruses (RNA &DNA), Classification of RNA & DNA oncogenic viruses, Properties of transformed cells, Oncogenes

MISCELLANEOUS VIRUSES-Prion diseases of human and animals slow viral diseases,

### **DESIRABLE TO KNOW**

GENERAL PROPERTIES OF VIRUSES - Viral haemagglutination

BACTERIOPHAGES - Phage typing, - Phage assay

POX VIRUSES - Milker's nodes, Cow pox virus

PICORNA VIRUSES - Difference between group A & B Coxsackie virus, Echoviruses

PARAMYXO VIRUSES - Respiratory syncytial virus (RSV), Parainfluenza viruses, Newcastle disease virus (NDV)

MISCELLANEOUS VIRUSES - Norwalk, calici &Astrovirus

## **UNIVERSITY EXAMINATION PATTERN**

### **THEORY**

Paper I & II, each 3 hours and Marks 80

Paper I - General bacteriology, Immunology, Systematic bacteriology

Paper II - Virology, Parasitology, Mycology and Applied Microbiology

**MBBS DEGREE EXAMINATION  
II YEAR MBBS  
MICROBIOLOGY PAPER – I & II**

**Time: 3 hours**

**Max. Marks: 80**

**PART - A (20 X 1 = 20 Marks)**

**I Multiple Choice Questions (20 Nos): (1-20)**

Must Know - 15

May Know - 05

**PART – B (10 + 20 = 30 Marks)**

**I Essay Questions (01 No) (1 x 10 = 10 Marks)**

1. Must Know

**II Short Notes (4 x 5 = 20 Marks)**

1. Must know
2. May know
3. May know
4. Desirable to know

**PART – C (10 + 20 = 30 Marks)**

**I Essay Questions (01 No) (1 x 10 = 10 Marks)**

1. Must Know

**II Short Notes (4 x 5 = 20 Marks)**

1. Must know
2. May know
3. May know
4. Desirable to know

**Marks allotted for Questions from**

1. Must Know Category = 15 MCQs + 2 Essays + 2 Short Notes = 45 marks
2. May Know Category = 5 MCQs + 4 Short Notes = 25 marks
3. Desirable to Know Category = 2 Short Notes 10 marks



**MODEL QUESTION PAPER**  
**MBBS DEGREE EXAMINATION**  
**II YEAR MBBS**  
**MBS15203 - MICROBIOLOGY – PAPER I**

Time: Three hours  
Theory: 2 hours 40 minutes  
M.C.Q: 20 minutes

Maximum: 80 marks  
Theory: 60 marks  
PART – A M.C.Q : 20 marks

**Answer ALL questions.**  
**Draw suitable diagrams wherever necessary.**

**PART –B**

**I. Essay** **1x10=10**

1. Classify immunoglobulins, draw and describe the structure of Immunoglobulin. Add a note on the functions of various immunoglobulins **(Must Know)**

**II. Short notes** **4x5=20**

1. Robert Koch **(Must Know )**
2. Group B streptococci **(May Know)**
3. Helicobacter pylori **(May Know)**
4. Vincent's angina **(Desirable to know)**

**PART –C**

**I. Essay** **1x10=10**

1. Classify Clostridia. Write in detail about the pathogenesis, laboratory diagnosis and prophylaxis of tetanus. **(Must Know)**

**II. Short notes** **4x5=20**

1. Type IV Hypersensitivity **(Must Know)**
2. Phase contrast Microscopy **(May Know)**
3. Non gonococcal urethritis **(May Know)**
4. Testing of disinfectants **(Desirable to know)**

**PART - A**  
**MULTIPLE CHOICE QUESTIONS**

**Choose the right answer**

**(20 X 1 =20 MARKS)**

**Must Know – 15**

**May Know - 5**

1. Use of carbolic acid as an antiseptic agent was introduced by **Must know**
    - a. Robert Koch
    - b. Louis Pasteur
    - c. Joseph Lister
    - d. Edward Jenner
  
  2. The generation time of Escherichia coli is **Must know**
    - a. 20 minutes
    - b. 20 hours
    - c. 20 days
    - d. 20 years
  
  3. Which one of the following component is present in Gram negative bacteria but not present in gram positive bacteria **Must know**
    - a. Peptidoglycan
    - b. Lipopolysaccharide
    - c. Capsule
    - d. Flagella
  
  4. Secretory IgA **Must know**
    - a. Is a monomer
    - b. Is a trimer
    - c. Lacks a J chain
    - d. Gains a secretory component at the mucous membrane
  
  5. Precipitation test include the following except **Must know**
    - a. Radial immune diffusion
    - b. Immunoelectrophoresis
    - c. Radio immune assay
    - d. Double diffusion in gel
  
  6. Which one of the following is a primary lymphoid organ **Must know**
    - a. Bone marrow
    - b. Lymphnode
    - c. Spleen
    - d. Mucosa associated lymphoid tissue
  
  7. which class of immunoglobulin binds to mast cells and basophils **Must know**
    - a. IgA
    - b. Ig
    - c. IgE
    - d. IgD
  
  8. Clinical infection leads to **Must know**
    - a. Active natural immunity
    - b. Active artificial immunity
    - c. Passive natural immunity
    - d. Passive artificial immunity
  
  9. Rice water stool is characteristic of infection with **Must know**
    - a. Shigella dysenteriae
    - b. Salmonella typhi
    - c. Vibrio cholera
    - d. Staphylococcus aureus
-

10. Which of the following is called Wool Sorter's disease **Must know**  
 a. Cutaneous anthrax                      b. Pulmonary anthrax  
 c. Intestinal anthrax                      d. Septicemic anthrax
11. Which of the following bacterium is frequently associated with nosocomial infection **Must know**  
 a. Salmonella                              b. Shigella  
 c. Vibrio                                      d. Pseudomonas
12. Which of the following test is used to identify Clostridium welchii **Must know**  
 a. Mc Fadyean reaction                      b. Mantoux test  
 c. Nagler's reaction                      d. Elek's test
13. Satellitism is shown by **Must know**  
 a. Yersinia pestis                      b. brucella abortus  
 c. Haemophilus influenza                      d. Bordetella pertussis
14. Example for an anaerobic culture media is **Must know**  
 a. Blood Agar                              b. MacConkey Agar  
 c. Robertson Cooked meat medium                      d. Chocolate Agar
15. The strain used for the preparation of BCG vaccine **Must know**  
 a. M tuberculosis                      b. M.bovis  
 c. M.kansasii                              d. M.marinum
16. The method of amplification of specific DNA sequence is **May know**  
 a. DNA probe                              b. Polymerase chain reaction  
 c. ELISA                                      d. Immunoblot
17. Which one of the following is a zoonosis **May know**  
 a. syphilis      b. cholera                      c. brucellosis      d. pneumonia
18. Predisposing factor in pseudomembranous colitis **May know**  
 a. Neonates                              b. clindamycin treatment  
 c. Dairy products                      d. alcohol intake
19. Bronchoscopes and cystoscopes can be sterilized by treating with **May know**  
 a. ethyl alcohol                              b. phenol  
 c. gluteraldehyde                      d. chlorine
20. Causative agent of Plague is **May know**  
 a. Yersinia .pestis.                      b. Yersinia .enterocolitica  
 c. Yersinia tuberculosis.                      d. Yersinia.pseudotuberculosis

**MODEL QUESTION PAPER**  
**MBBS DEGREE EXAMINATION**  
**II YEAR MBBS**  
**MBS15204 - MICROBIOLOGY –PAPER II**

Time: Three hours  
Theory: 2 hours 40 minutes  
M.C.Q: 20 minutes

Maximum: 80 marks  
Theory: 60 marks  
PART – A M.C.Q : 20 marks

**Answer ALL questions.**  
**Draw suitable diagrams wherever necessary.**

**PART –B**

**I. Essay:** **1x10=10**

1. Classify Plasmodium species. Describe the morphology and life cycle of Plasmodium falciparum. Add a note on Laboratory diagnosis and complications of falciparum malaria. **(Must Know)**

**II. Short notes** **4x5=20**

1. Phage typing **(Desirable to know)**
2. Mycotic Poisoning **(May know)**
3. Free living amoeba **(May Know)**
4. Prophylaxis of poliomyelitis **(Must Know)**

**PART –C**

**I. Essay** **1x10=10**

1. Describe the morphology, pathogenesis and laboratory diagnosis of HIV- Write briefly about the CDC- Classification and prevention of HIV **(Must Know)**

**II. Short notes** **4x5=20**

1. Dermatophytes **(Must Know)**
2. Fungal spores **(May Know)**
3. Paragonimus westermani **(May know)**
4. Viral Haemagglutination **(Desirable to know)**

**PART - A**  
**MULTIPLE CHOICE QUESTIONS**

**Choose the right answer**

**(20 X 1 =20 MARKS)**

**Must Know – 15**

**May Know -5**

1. Auto infection is seen in **Must know**
    - a. T. Saginata
    - b. Ascaris
    - c. H.nana
    - d. Enterobius vermicularis
  
  2. Cerebral malaria is caused by **Must know**
    - a. Plasmodium vivax
    - b. Plasmodium falciparum
    - c. Plasmodium malariae
    - d. Plasmodium ovale
  
  3. Selective media for fungus culture is **Must know**
    - a. SDA
    - b.LJ
    - c.RCM
    - d. MacConkey
  
  4. All are examples of dimorphic fungus except **Must know**
    - a. Histoplasma
    - b. Cryptococcus
    - c. Blastomyces
    - d. Coccidioides
  
  5. Loeffler's syndrome is caused by **Must know**
    - a. Trichuris trichura
    - b. Wuchereria bancrofti
    - c. Enterobius vermicularis
    - d. Ascaris lumbricoides
  
  6. Vaginal discharge due to C.albicans is **Must know**
    - a. Frothy
    - b. Foul smelling
    - c. Curdy white
    - d. Yellow
  
  7. Which of following is not an RNA virus? **Must know**
    - a. Polio
    - b. Ebstein barr virus
    - c. Rabies virus
    - d. Influenza virus
  
  8. Shingles is caused by **Must know**
    - a. Varicella Zoster
    - b. Ebstein- Barr virus
    - c. Cytomegalovirus
    - d. Herpes simplex virus
  
  9. Significant bacteriuria is **Must know**
    - a.  $10^2$  CfU /ml of urine
    - b.  $10^3$  CfU /ml
    - c.  $10^5$  CfU / ml
    - d.  $10^4$  CfU/ml
-

10. Sporotrichosis causes **Must know**  
a. Superficial mycoses                      b. Cutaneous mycoses  
c. subcutaneous mycoses                  d. systemic mycoses
11. Most common site of extraintestinal Amoebiasis **Must know**  
a. Liver              b. Spleen              c. Brain              d. Kidney
12. Inclusion body diagnostic of rabies is **Must know**  
a. Negri body                                  b. Cowdry  
c. Molluscum bodies                        d. Guarneri bodies
13. Vaccine for Hepatitis B. virus is **Must know**  
a. Killed vaccine                              b. Subunit vaccine  
c. live vaccine                                 d. Live attenuated vaccine
14. Eight segmented RNA is characteristic of **Must know**  
a. Orthomyxo virus                          b. Paramyxo virus.  
c. Picorna virus                                d. Parvo virus
15. Specimen of choice for the diagnosis of Trichinella spiralis is **Must know**  
a. Muscle biopsy                              b. Lymph node biopsy  
c. Peripheral blood smear                  d. Stool.
16. Aflatoxin is produced by **May know**  
a. Aspergillus .niger .                        b. Aspergillus flavus.  
c. Aspergillus fumigatus                    d. Aspergillus.tereus
17. Which of the following is a oncogenic virus **May know**  
a. HAV              b. HBV              c. HEV              d. HGV
18. Culture medium for the diagnosis of Leishmaniasis is **May know**  
a. Diamond medium                         b. Eagle Medium  
c. NNN medium                                d. RPMI medium
19. Causative agent of Hydatid cyst is **May know**  
a. Echinococcus                                b. Enterabius  
c. Entaoeda                                      d. Fasciola
20. Ebstein-Barr Virus causes all of the following infections except **May know**  
a. Infectious mononucleosis              b. Carcinoma cervix  
c. Burkitt's lymphoma                        d. Nasopharyngeal carcinoma
-

## **BOOKS RECOMMENDED**

1. Textbook of Microbiology by Ananthanarayanan and Jayaram Panicker, 9<sup>th</sup> Edition, University Press, 2014.
2. Textbook of Microbiology by Prof. C.P. Baveja, 4<sup>th</sup> Edition, Arya Publication, 2012.
3. Textbook of medical Parasitology – Jayaram Panicker, 7<sup>th</sup> Edition, Jaypee, 2013.
4. Medical Parasitology – by Prof. C.P. Baveja.

## **REFERENCE BOOKS**

1. Medical Microbiology –Greenwood, Maekie of Mleartney, 14<sup>th</sup> Edition, University Press, 2012.
2. Medical Microbiology by jawetz, 26th Edition, McGraw hill, 2012.
3. Essential Immunology – Ivon M. Roitt, 12<sup>th</sup> Edition, Mosby, 2011.
4. Immunology – Kuby, 7<sup>th</sup> Edition, Freeman, 2013.

## **JOURNALS FOR REFERENCE**

- Journal of Medical Microbiology, Lippincott.
- Journal of Clinical Microbiology, The American Society for Microbiology.
- Indian Journal of Medical Research (ICMR)

**II MBBS**  
**PATHOLOGY**  
**CURRICULUM**

**(i) Introduction**

The course in Pathology consists for descriptive purposes of three semesters, each of 6 months duration. The teaching will consist of Theory Component, which would comprise of 95 hrs of didactic teaching and will be clinically integrated as far as possible.

The practical classes will comprise of 120 hrs (60 x 2 hrs each) of exercises. This will concentrate on those tests, which can be performed by the house officers in the side lab and also on interpretation of values.

The exercises will include peripheral smear study; estimation of haemoglobin, blood grouping/typing, urine analysis by strips, interpretation of charts, image quiz, slide and specimen demonstrations. The time allocated for the tutorials is approximately 90 hrs. This will include seminars, assignments and problem based learning.

As a part of learning exercises and to promote self-study, problem based learning, which is clinically integrated, will be introduced. These will involve small group discussions and will be part of internal assessment. These will be conducted in three sessions of 2 hrs each.

**(ii) Objectives**

**(A) Knowledge**

At the end of the course the student shall be able to:

- (a) describe the structure of a sick cell, mechanisms of cell degeneration, cell death and repair and be able to correlate structural and functional alterations.
- (b) explain the patho-physiological process, which govern the maintenance of fluid and homeostasis, mechanisms of their disturbance and the morphological and clinical manifestations associated with it.
- (c) describe the mechanisms and patterns of tissue response to injury so that he/she can appreciate the patho-physiology of disease process and their clinical manifestations.
- (d) correlate normal and altered morphology (gross and microscopic) of different organ systems in common diseases to the extent needed for understanding of disease processes and their clinical significance.



## **(B) Skills**

At the end of the course the student shall be able to:

- (a) describe the rationale and principles of technical procedures of the diagnostic laboratory tests and interpretation of the results.
- (b) perform the simple bed-side tests on blood, urine and biological fluids samples.
- (c) draw a rational scheme of investigations aimed at diagnosing and managing the causes of common disorders.
- (d) understand biochemical / physiological disturbances that occur as a result of disease in collaboration with pre-clinical Departments.

## **(C) Integration**

At the end of training he/she shall be able to integrate causes of diseases, their relationship with different etiological factors (social, economic and environmental) that contribute to the natural history of diseases that are most prevalent in India.

### **Detailed Syllabus**

#### **INTRODUCTION**

#### **GENERAL PATHOLOGY**

1. Historical aspects; definition of terms; introduction to pathology, its application and role in patient management.
2. Cellular responses to stress and noxious stimuli, cellular adaptation of growth and differentiation (hyperplasia, hypertrophy, atrophy and metaplasia)
3. Cell injury and cell death (cause and mechanism of reversible and irreversible injury). Morphology of cell injury (reversible and necrosis), examples of cell injury and necrosis (ischemia, hypoxia, reperfusion and chemical injuries).
4. Apoptosis and sub-cellular responses to injury.
5. Intracellular accumulation, calcification and cellular ageing; (Lipid, protein, glycogen and pigment accumulation; pathologic calcification, ageing).

#### **INFLAMMATION / REPAIR**

1. Introduction to body's immune response (innate and adaptive immunity; cells and tissues of immune system; cytokines; structure and function of HLA).
2. General features of inflammation; vascular events; cellular events – leucocyte adhesion and transmigration.

3. Continuation of cellular events (chemotaxis, phagocytosis, defects of leucocyte function); termination of acute inflammatory response; outcome of acute inflammation; morphological patterns of acute inflammation;
4. Chemical mediators (vaso-active amines; plasma proteins; AA metabolites; PAF; cytokines; chemokines; leucotrienes; Nitric oxide; free radicals and neuropeptides).
5. Chronic inflammation (cause, morphological features; cells of chronic inflammation; granuloma; systemic effects of inflammation; consequences of excessive /defective inflammation).
6. Repair (healing; scar formation; cutaneous wound healing; healing at special sites; factors affecting wound healing).

### **HEMODYNAMIC DISTURBANCES**

1. Oedema, Hypo tension, congestion, hemorrhage and homeostasis.
2. Thrombosis and embolism
3. Infarction, Shock

### **GENETIC DISORDERS**

1. Normal karyotype; cytogenesis disorders (autosomal and x – chromosomal disorders).
2. Mutation; Mendelian disorders (transmission pattern, biochemical and molecular basis of single gene disease; principles of multifactor inheritance).
3. Genetic disorders affecting structural protein, receptor protein, enzymes and regulatory proteins; single gene disease with non-classical inheritance. (mitochondrial gene mutation, genomic imprinting, molecular diagnosis).

### **IMMUNITY**

1. Disorders of immunity – mechanisms of hypersensitivity
2. Autoimmunity – SLE
3. Rheumatoid arthritis, systemic sclerosis, Sjogren's, Mixed Connective Disorders, amyloidosis
4. Primary and Secondary immunodeficiency

### **NEOPLASIA**

1. Definition, nomenclature, biology of tumor growth, differences between benign and malignant tumors, tumor spread and epidemiology.
2. Molecular basis of Neoplasia (essential alterations for malignant transformation, oncogenes, suppressor genes).

3. Evasion of apoptosis; defects in DNA repair, telomerase and angiogenesis; invasion and metastasis; dysregulation of genes).
4. Carcinogenesis (carcinogenic agents, molecular basis of carcinogenesis)
5. Host defense, tumor immunity clinical features, and laboratory diagnosis.

### **INFECTIOUS DISEASES**

1. General principles (categories, transmission and dissemination of microbes, mechanisms of microbial disease, immune evasion, infections in immuno-suppressed hosts, tissue response to microbes).
2. Pathology of common viral and bacterial infections (CMV, EBV, HPV, hepatitis viruses, Gram positive and negative bacterial infections).
3. Mycobacterium infections – tuberculosis.
4. Leprosy, Syphilis and others.
5. Fungal and parasitic infections.

### **ENVIRONMENTAL / NUTRITIONAL**

1. Environmental diseases
2. Nutritional diseases

### **INFANCY AND CHILDHOOD DISEASES**

Congenital anomalies, birth weight, gestational age, birth injuries, prenatal infections, NRDS, necrotizing enterocolitis, fetal hydrops. Inborn errors of metabolism, SIDS, childhood tumors.

## **SYSTEMIC PATHOLOGY – DISEASES OF THE ORGAN SYSTEMS**

### **BLOOD VESSELS**

1. Atherosclerosis and Hypertension
2. Vasculitis, Congenital anomalies, aneurysms and tumours.

### **THE HEART**

1. Ischaemic heart disease and myocardial infarction.
2. Rheumatic fever.
3. Infective endocarditis; diseases of the pericardium.
4. Congenital heart disease, diseases of the myocardium, tumours of the heart.

### **RBC AND BLEEDING DISORDERS**

1. Development of haematopoietic cells, bone marrow, classification of anemia.

2. Anemia of blood loss, Nutritional anemias.
3. Anemia of chronic disease, aphasia, other forms of impaired production.
4. Hemolytic anemia – classification, membrane defects, enzyme defects  
Acquired hemolytic anemia, polycythaemia.
5. Haemoglobinopathies - HbS, E, C and Thalassemia.
6. Bleeding disorders – classification, disorders of platelets, coagulation disorders.

### **WBC, LYMPH NODE, SPLEEN**

1. Non-neoplastic quantitative and qualitative disorders of leucocytes
2. Leukemia – classification, etiology, acute leukemias.
3. Chronic leukemias, MDS, other chronic myelo-proliferative disorders including myelofibrosis.
4. Non-neoplastic disorders of lymph node, spleen and thymus; classification of lymphoma.
5. Hodgkin Lymphoma and Non-Hodgkin lymphoma
6. Non-Hodgkin lymphoma (Contd) and Plasma cell dyscrasias.
7. Blood Banking.

### **THE LUNG**

1. Atelectasis, acute lung injury, ARDS, acute interstitial pneumonia.
2. Chronic Obstructive Pulmonary Disease – emphysema, bronchial asthma, bronchiectasis
3. Diffuse interstitial diseases (infiltrative, restrictive) – fibrosing diseases (mainly pneumoconiosis), sarcoidosis, Pulmonary eosinophilia, smoking related diseases.
4. Pulmonary infections – Pneumonias
5. Tumours of lung and Diseases of pleura.

### **HEAD AND NECK**

1. Benign and malignant lesions of head and neck including oral cavity, salivary glands.

### **GASTRO -INTESTINAL TRACT**

1. Oesophagus – Congenital anomalies, motor dysfunction, GERD and tumours.
2. Gastritis and Peptic ulcer.
3. Tumours of stomach
4. Congenital anomalies of intestine, malabsorption syndromes and Enterocolitis
5. Irritable Bowel – Crohn's and Ulcerative colitis

6. Tumours of small and large intestine, diseases of appendix and peritoneum.

### **LIVER AND BILIARY TRACT**

1. General features of liver disease (patterns of hepatic injury, jaundice, portal hypertension, hepatic failure, liver function tests).
2. Infectious diseases of liver.
3. Alcoholic liver disease, cirrhosis, metabolic liver disease.
4. Intrahepatic biliary tract lesions and tumours, Diseases of gallbladder-cholecystitis, cholelithiasis, tumours.

### **PANCREAS**

Acute pancreatitis and tumours.

### **KIDNEY**

1. Normal Structure, congenital anomalies, cystic disease, laboratory tests in renal disease.
2. Nephritic syndrome – pathogenesis and pathology.
3. Nephrotic syndrome – pathogenesis and pathology.
4. Diseases of tubules and interstitium, Diseases of blood vessels, urolithiasis, hydronephrosis.
5. Tumours of the kidney, renal pelvis and urinary bladder.

### **MALE GENITAL TRACT**

1. Congenital anomalies and tumours of penis, BPH and tumours of prostate.
2. Testis – infertility, atrophy, tumours.

### **FEMALE GENITAL TRACT**

1. Infections of Female Genital Tract, lesions of vulva and vagina, Diseases of cervix.
2. Endometrium – Dysfunctional Uterine Bleeding, inflammation, endometriosis, adenomyosis, endometrial hyperplasia and ployps, Tumours of Endometrium, myometrium and fallopian tubes.
3. Ovary: non – neoplastic lesions of ovary, classification and pathology of ovarian tumours.
4. Diseases of placenta.

### **BREAST**

1. Benign lesions of the breast.
2. Malignant lesions of the breast.

### **ENDOCRINE SYSTEM**

1. Diseases of pituitary gland, parathyroid, pineal gland and Multiple Endocrine Neoplasia.
2. Benign and malignant lesions of thyroid.
3. Diseases of Adrenals.
4. Diabetes mellitus.

### **SKIN**

Diseases of the skin.

### **BONE & JOINTS**

1. Infections, metabolic disease of bone.
2. Bone tumours.
3. Diseases of joints.

### **SOFT TISSUE & MUSCLE**

Diseases of soft tissue and muscle.

### **CENTRAL NERVOUS SYSTEM & SPECIAL SENSES**

1. Infections, degenerative disorders of Central Nervous System, Cerebrospinal Fluid analysis.
2. Tumours of brain and Spinal cord.
3. Special senses.

**SRM MEDICAL COLLEGE HOSPITAL & RESEARCH CENTRE**  
**DEPARTMENT OF PATHOLOGY**  
**SYLLABUS WITH MUST KNOW, DESIRABLE TO KNOW & NICE TO KNOW**  
**CATEGARIZATION**

**MARK DISTRIBUTION:-**

**Must know – 60%**

**May know - 30 %**

**Desirable to know – 10%**

**HAEMATOLOGY**

**Must know**

- 1) Bone marrow Aspiration – S.N
- 2) Definition & Classification of Anaemia – Essay / S.N
- 3) Iron Deficiency Anaemia Blood picture Lab inv - Essay/ S.N
- 4) Megaloblastic anaemia/ Pernicious Anaemia/B12/Folic acid deficiency  
Etio-pathogenesis, Blood picture, bone marrow picture, Lab diagnosis.  
Blood picture/ Bone marrow picture - Essay / S.N
- 5) Aplastic Anaemia Bone marrow picture – Essay / S.N
- 6) Haemolytic Anaemia-classification – Part of Essay / S.N
- 7) Spherocytosis Osmotic fragility test/Lab diagnosis – Essay / S.N
- 8) Sickle cell Anaemia Sickle cell crises/Lab diagnosis – Essay / S.N
- 9) Thalassemia Pathogenesis, classification, blood picture, lab diagnosis  
of beta thalassemia Beta thalassemia blood picture / Lab diagnosis  
Alpha Thalassemia – Essay / S.N
- 10) Spherocytosis Pathogenesis, Blood picture, lab Diagnosis SN  
Pathogenesis/Lab diag /Osmotic Fragility – Essay / S.N
- 11) Leukaemoid reaction – S.N
- 12) Hodgkin lymphoma Reed Sternberg Cell – Essay / S.N
- 13) Leukaemia- Definition, classification, Cytochemistry, blood picture of  
Acute myeloid Leukaemia Cytochemistry of leukaemias – Essay/S.N
- 14) Leukaemia- Definition, classification, Cytochemistry, blood picture of  
Acute Lymphoblastic Leukaemia – Essay
- 15) Chronic Myeloid Leukaemia Philadelphia Chromosome - Essay
- 16) Chronic Lymphoid Leukaemia – Essay/S.N
- 17) Multiple Myeloma Diagnostic criteria, clinical presentation, blood picture,  
BM picture, variants of plasma cells - Essay
- 18) Bernard Soulier syndrome – Essay/S.N
- 19) Haemophilia – Essay / S.N
- 20) ESR/PCV – Essay / S.N

### **May know**

- 1) Red cell inclusions / Howell Jolly Bodies/Heinz bodies – S.N
- 2) Morphological changes of RBC's/target cells – S.N
- 3) Alpha-thalassemia – S.N
- 4) Agranulocytosis – S.N
- 5) Non-Hodgkin lymphoma – S.N
- 6) Myelofibrosis – S.N
- 7) Platelets morphology, thrombocytopenia, diagnostic tests – S.N
- 8) Von Willebrand Disease – S.N
- 9) Disseminated intravascular coagulation – S.N
- 10) Investigations in Bleeding Disorders – S.N
- 11) BT,CT, PT, APTT – S.N
- 12) Blood Transfusion- components, procedure, complications – S.N
- 13) Erythroblastosis foetalis – S.N
- 14) Haemoglobin estimation-methods – S.N

### **Desirable to know**

- 1) Red cell indices – S.N
- 2) Reticulocyte count – S.N
- 3) Sideroblastic Anaemia – S.N
- 4) Hydrops foetalis – S.N
- 5) Glucose-6-phosphate Dehydrogenase deficiency – S.N
- 6) Pyruvate kinase Deficiency – S.N
- 7) Anaemia in renal failure – S.N
- 8) Polycythemia – S.N
- 9) Polycythemia rubra vera – S.N
- 10) Leuko-erythroblastic reaction – S.N
- 11) Infectious mononucleosis – S.N
- 12) Waldenstrom's macroglobulinaemia – S.N
- 13) Idiopathic Thrombocytopenic Purpura – S.N
- 14) Glanzmann's Disease – S.N
- 15) Coombs test – S.N
- 16) LE cell – S.N



**PAPER - I - GENERAL PATHOLOGY**  
**CELLULAR ADAPTATION, REVERSIBLE & IRREVERSIBLE CELLINJURY**

**Must Know**

- 1) Fatty change/fatty liver – S.N
- 2) Pigments- classification, manifestation and demonstration – Essay / S.N
- 3) Haemosiderin- Haemosiderosis/Haemochromatosis-causes and manifestation – Essay / S.N
- 4) Necrosis-definition/types – Essay / S.N
- 5) Individual type of necrosis – S.N
- 6) Apoptosis/ difference between apoptosis& Necrosis – Essay / S.N
- 7) Gangrene- definition, types and differences –Essay / S.N
- 8) Individual types of gangrene – S.N
- 9) Pathological calcification/dystrophic/metastatic calcification – S.N
- 10) Individual type of cellular adaptation-atrophy/hypertrophy/hyperplasia – S.N

**Desirable to know**

- 1) Etiology and Pathogenesis of reversible cell injury – S.N
- 2) Free radical injury – S.N
- 3) Morphology of reversible cell injury – S.N
- 4) Stains for fat – S.N
- 5) Frozen section – S.N
- 6) Melanin pigment – S.N

**INFLAMMATION**

**Must Know**

- 1) Inflammation – definition and vascular changes - Essay
- 2) Inflammation – definition and cellular events - Essay
- 3) Inflammation –mediators - Essay
- 4) Arachidonic acid metabolism – S.N
- 5) Phagocytosis – S.N
- 6) Chemotaxis – S.N
- 7) Granuloma/granulomatous diseases – S.N
- 8) Types of giant cells – S.N
- 9) Tuberculosis- types ,etiopathogenesis, manifestations and laboratory diagnosis - Essay
- 10) Primary/Ghon's complex – S.N
- 11) Miliary tuberculosis – S.N
- 12) Differences between primary and secondary tuberculosis – S.N

- 13) Leprosy-classification, etiopathogenesis and gross and microscopic features - Essay
- 14) Lepromatous leprosy – S.N
- 15) Tuberculoid leprosy – S.N
- 16) Syphilis-etiopathogenesis, stages and manifestations,laboratory diagnosis - Essay
- 17) Typhoid- etiopathogenesis, stages complications, laboratory diagnosis. - Essay
- 18) Metaplasia – S.N
- 19) Dysplasia – S.N

#### **May know**

- 1) Congenital syphilis – S.N
- 2) Actinomycosis – S.N

#### **Desirable to know**

- 1) Cardio-vascular syphilis – S.N

### **WOUND HEALING**

#### **Must Know**

- 1) Types of wound healing- healing by first intention – Essay / S.N
- 2) Types of wound healing- healing by second intention – Essay / S.N
- 3) Factors affecting wound healing – Essay / S.N
- 4) Complications of wound healing – S.N
- 5) Fracture healing- types of fractures, stages, complications – Essay / S.N

#### **May know**

- 1) Ulcer – S.N
- 2) Abscess – S.N

### **CIRCULATORY DISTURBANCES**

#### **Must Know**

- 1) Oedema- definition,pathogenesis,manifestations - Essay
- 2) Thrombosis- definition, Thrombogenesis, morphology, complications - Essay
- 3) Embolism- definition, types, and any specific type - Essay
- 4) Thrombo-embolism – S.N
- 5) Air embolism – S.N
- 6) Fat embolism – S.N
- 7) Amniotic fluid embolism – S.N

- 8) Infarction- definition, types and organ changes - Essay
- 9) Differences between arterial and venous infarct – Essay / S.N
- 10) Shock- definition, types, stages, organ changes and complications - Essay

### **May know**

- 1) Arterial& venous thrombus – S.N
- 2) Mural thrombus – S.N

### **Desirable to know**

- 1) Differences between transudate and exudates – S.N
- 2) Ante-mortem and post-mortem clot – S.N
- 3) CVC liver – S.N
- 4) CVC spleen -S.N
- 5) Shock kidney – S.N
- 6) Shock lung – S.N

## **IMMUNOLOGICAL DISORDERS**

### **Must Know**

- 1) Type I Hypersensitivity reaction – S.N
- 2) Type II Hypersensitivity reaction – S.N
- 3) Type III Hypersensitivity reaction – S.N
- 4) Type I V Hypersensitivity reaction – S.N
- 5) Autoimmune disorders – Essay
- 6) SLE – S.N
- 7) Rheumatoid arthritis – S.N
- 8) AIDS – Essay / S.N
- 9) Amyloidosis - Essay
- 10) Types, stains for Amyloid - S.N

### **May know**

- 1) Primary immuno deficiency – S.N
- 2) Transplant rejection – S.N

### **Desirable to know**

- 1) Human leucocyte system (HLA)/MHC – S.N
- 2) Organ changes in Amyloid – S.N

## NEOPLASIA

### Must Know

- 1) Neoplasia – definition, differences between benign & malignant, spread of tumors – Essay/ S.N
- 2) Metastasis – S.N
- 3) Chemical carcinogenesis – Essay / S.N
- 4) Viral carcinogenesis – Essay / S.N
- 5) Tumor markers – S.N
- 6) Lab diagnosis of cancer – Essay / S.N
- 7) Premalignant lesions – S.N

### May know

- 1) Paraneoplastic syndromes – S.N
- 2) FNAC/ Exfoliative cytology - S.N
- 3) Common individual tumors- Squamous cell ca., Basal cell ca., Teratoma , Leiomyoma, Fibroadenoma, Pleomorphic adenoma etc. – S.N

### Desirable to know

- 1) Oncogenes – S.N

## NUTRITIONAL DISORDERS

### Must Know

- 1) Protein energy malnutrition – S.N
- 2) Vit A/D/C deficiency – S.N
- 3) Hemochromatosis / hemosiderosis – Essay / S.N

### May know

- 1) Gout – S.N

### Desirable to know

- 1) Radiation injury – S.N

## DISEASES OF INFANCY AND CHILDHOOD

### May know

- 1) Retinoblastoma – S.N
- 2) Hyaline membrane disorder – S.N
- 3) Hamartoma/ haemangioma/Lymphangioma – S.N

## **PAPER - II - SYSTEMIC PATHOLOGY**

### **Blood Vessels**

#### **Must Know**

- 1) Aneurysms – Definition, types, morphology & complications - Essay
- 2) Dissecting aneurysm – S.N
- 3) Atherosclerosis – Risk factors, pathogenesis, theories, morphology & complications - Essay
- 4) Morphology of atheromatous plaque – S.N

#### **May know**

- 1) Vascular hamartoma (hemangioma) – S.N
- 2) Granuloma pyogenicum – S.N

#### **Desirable to know**

- 1) Types of vasculitis – S.N
- 2) Glomus tumor (glomangioma) – S.N
- 3) Kaposi sarcoma – S.N

## **CARDIOVASCULAR SYSTEM**

#### **Must Know**

- 1) Myocardial infarction – risk factors, morphology, microscopic changes & complications - Essay
- 2) Rheumatic heart disease – etiopathogenesis, morphological changes & diagnostic criteria - Essay
- 3) Aschoff nodule – S.N
- 4) Vegetations of heart – S.N
- 5) Infective endocarditis – etiopathogenesis, vegetations and diagnostic criteria - Essay

#### **May know**

- 1) Types of pericarditis – S.N

#### **Desirable to know**

- 1) Types of Cardiomyopathy – S.N
- 2) Myxoma – S.N

## RESPIRATORY SYSTEM

### Must Know

- 1) Pneumonia-definition, types and any specific type - Essay
- 2) Lobar pneumonia – Essay/S.N
- 3) Bronchopneumonia – Essay / S.N
- 4) Chronic obstructive pulmonary diseases. - Essay
- 5) Types Bronchiectasis – S.N
- 6) Bronchial asthma – Essay / S.N
- 7) Emphysema- definition, types, morphological changes - Essay
- 8) Centriacinar emphysema – S.N
- 9) Panacinar emphysema – S.N
- 10) Asbestosis – S.N
- 11) Bronchogenic carcinoma – Classification etiology gross and microscopy - Essay

### May know

- 1) Small cell carcinoma / Oat cell carcinoma – S.N
- 2) Carcinoid tumour – S.N

### Desirable to know

- 1) Adult respiratory distress syndrome/hyaline membrane disease – S.N
- 2) Pleural effusion types – S.N
- 3) Mesothelioma – S.N

## HEAD & NECK AND SALIVARY GLANDS

### Must Know

- 1) Retinoblastoma – S.N
- 2) Pleomorphic adenoma – S.N
- 3) Mucoepidermoid tumour – S.N
- 4) Warthin's tumour – S.N
- 5) Tumours of the salivary gland – S.N

### May know

- 1) Ameloblastoma – S.N

### Desirable to know

- 1) Rhinosporidiosis – S.N
- 2) Odontogenic tumours – S.N

## GASTROINTESTINAL TRACT

### Must Know

- 1) Helicobacter Pylori Gastritis – S.N
- 2) Peptic ulcer – sites, pathogenesis morphology and complications - Essay
- 3) Gastric carcinoma – etiopathogenesis stages gross and microscopic features. - Essay
- 4) Inflammatory bowel disease – Crohn's disease and ulcerative colitis - Essay
- 5) Polyps of intestine – S.N
- 6) Ulcers of intestine – S.N
- 7) Colorectal carcinoma – etiopathogenesis gross microscopic features and staging - Essay

### Desirable to know

- 1) Barrett's esophagus – S.N
- 2) Chronic gastritis – S.N
- 3) Carcinoid tumour – S.N

## LIVER, GALL BLADDER AND PANCREAS

### Must Know

- 1) Cirrhosis – definition types, etiopathogenesis and morphology of any one type - Essay
- 2) Alcoholic liver disease - Essay
- 3) Viral hepatitis – Classification morphological changes and lab diagnosis - Essay
- 4) Hepatocellular carcinoma – etiopathogenesis, types gross and microscopic features. - Essay
- 5) Gall stones – S.N
- 6) Acute Pancreatitis – S.N
- 7) Chronic pancreatitis – S.N
- 8) Fulminant hepatitis – S.N

### May know

- 1) Pancreatic carcinoma – S.N
- 2) Biliary cirrhosis – S.N
- 3) Haemochromatosis – S.N
- 4) Chronic active hepatitis – S.N

### Desirable to know

- 1) Wilson's disease – S.N

## KIDNEY AND URINARY BLADDER

### Must Know

- 1) Acute Glomerulonephritis - Essay
- 2) Nephritic syndrome - Essay
- 3) Nephrotic Syndrome - Essay
- 4) Minimal change disease (lipoid nephrosis) – S.N
- 5) Membranous Glomerulonephritis – S.N
- 6) Membrano proliferative Glomerulonephritis – S.N
- 7) Focal Glomerulonephritis – S.N
- 8) Polycystic kidney – S.N
- 9) Diabetic nephropathy – S.N
- 10) Acute tubular necrosis – S.N
- 11) Acute pyelonephritis - Essay
- 12) Chronic pyelonephritis - Essay
- 13) Renal cell carcinoma – S.N
- 14) Wilm's tumour – S.N

### May know

- 1) Hydro nephrosis – S.N
- 2) Benign nephrosclerosis – S.N
- 3) Malignant nephrosclerosis – S.N
- 4) Granular contracted kidney – S.N
- 5) Urolithiasis – S.N
- 6) Stag-horn calculus – S.N
- 7) Transitional cell carcinoma – S.N

## MALE GENITAL TRACT

### Must Know

- 1) Classification of testicular tumours - Essay
- 2) Seminoma – S.N
- 3) Teratoma – S.N
- 4) Nodular hyperplasia of prostate – S.N

### Desirable to know

- 1) Cryptorchidism – S.N



## FEMALE GENITAL TRACT

### Must Know

- 1) Carcinoma cervix – Etiopathology, types staging and diagnosis - Essay
- 2) Cervical intraepithelial neoplasia – S.N
- 3) Endometriosis – S.N
- 4) Adenomyosis – S.N
- 5) Leiomyoma- S.N
- 6) Classification of ovarian tumour - Essay
- 7) Granulosa cell tumour – Essay / S.N
- 8) Dysgerminoma – S.N
- 9) Hydatidiform mole – S.N
- 10) Serous tumour – S.N
- 11) Mucinous tumour – S.N
- 12) Choriocarcinoma – S.N
- 13) Carcinoma breast – classification gross microscopic features and lab diagnosis - Essay

### May know

- 1) Krukenberg tumour – S.N
- 2) Endometrial hyperplasia – S.N
- 3) Fibrocystic disease – S.N
- 4) Cystosarcoma phyllodes – S.N
- 5) Fibroadenoma – S.N

### Desirable to know

- 1) Polycystic ovary – S.N
- 2) Pseudomyxoma peritonei – S.N

## ENDOCRINE DISORDERS

### Must Know

- 1) Pheochromocytoma – S.N
- 2) Multinodular goiter – S.N
- 3) Grave's Disease – S.N
- 4) Hashimotos Thyroiditis – S.N
- 5) Diabetes Mellitus - Essay

### May know

- 1) MEN syndrome – S.N
- 2) Tumours of thyroid – S.N

### Desirable to know

- 1) Cushing's syndrome - S.N

## **BONE & JOINTS**

### **Must Know**

- 1) Classification of bone tumours - Essay
- 2) Osteosarcoma – S.N
- 3) Giant cell tumour – S.N
- 4) Ewing sarcoma – S.N
- 5) Osteomyelitis – S.N

### **May know**

- 1) Rheumatoid Arthritis – S.N

### **Desirable to know**

- 1) Osteoporosis – S.N

## **CNS**

### **Must Know**

- 1) Meningitis / CSF Analysis – S.N

### **May know**

- 1) Classification of CNS tumours – S.N
- 2) Astrocytoma – S.N
- 3) Meningioma – S.N
- 4) Schwannoma – S.N
- 5) Neurofibroma – S.N

## UNIVERSITY EXAMINATION PATTERN

### THEORY

Papers – I & II each three hours and maximum 60 marks

Paper – I : General pathology and Hematology

Paper – II : Systemic pathology

#### Pattern

##### Paper – I

##### PART – A: Multiple choice questions

General pathology = 10 marks

Hematology & clinical pathology = 9+1 = 10 marks

##### PART – B

##### General Pathology

1 essay = 10 marks

Short notes 4 x 5 = 20 marks

##### PART – C

##### Hematology

1 essay = 10 marks

Short notes 4x 5 = 20 marks

##### Paper – II

##### PART – A : Multiple choice questions

Systemic Pathology = 20 marks

##### PART - B

Systemic pathology (Blood vessels, CVS, Respiratory system, Gastrointestinal tract, Liver & gallbladder

1 essay = 10 marks

Short notes 4 x 5 = 20 marks

##### PART - C

Kidney, reproductive system (male & female), Breast, endocrines, bone & joints, CNS

1 essay = 10 marks

Short notes 4 x 5 = 20 marks

## **PRACTICAL EXAMINATION**

### **Spotters (20 x ½ = 10 marks)**

1½ minute for each spotter

Histopathology slides = 10

Hematology = 2

Specimen description = 6

Instruments = 2

### **Hematology Major 10 marks**

Peripheral smear

Staining

Differential count

Peripheral smear report

### **Hematology minor 5 marks**

Hemoglobin estimation (or) Blood grouping

### **Urine examination 10 marks**

Physical examination

Chemical examination

### **Chart 5 marks**

Chart diagnosis and description

### **Specimen Description = 5 marks**

#### **Slide description = 5 marks**

(Each 5 minutes)

Viva voce = 30 marks

Minimum for pass:

Qualifying mark in exam 35% in Internal Assessment (60 marks)

Pass in University exam:

50% in Theory = 80/160

50% in practical = 25/50

Viva marks = 30

50% overall = 150 / 300

Eligibility to appear for examination:

Attendance = 75 percent

I.A Marks = 35 percent

**MBBS DEGREE EXAMINATION  
II YEAR MBBS  
PATHOLOGY PAPER – I & II**

**Time: 3 hours**

**Max. Marks: 80**

**PART - A (20 X 1 = 20 Marks)**

**I Multiple Choice Questions (20 Nos): (1-20)**

Must Know - 15

May Know - 05

**PART – B (10 + 20 = 30 Marks)**

**I Essay Questions (01 No) (1 x 10 = 10 Marks)**

1. Must Know

**II Short Notes (4 x 5 = 20 Marks)**

1. Must know
2. May know
3. May know
4. Desirable to know

**PART – C (10 + 20 = 30 Marks)**

**I Essay Questions (01 No) (1 x 10 = 10 Marks)**

1. Must Know

**II Short Notes (4 x 5 = 20 Marks)**

1. Must know
2. May know
3. May know
4. Desirable to know

**Marks allotted for Questions from**

1. Must Know Category = 15 MCQs + 2 Essays + 2 Short Notes = 45 marks
2. May Know Category = 5 MCQs + 4 Short Notes = 25 marks
3. Desirable to Know Category = 2 Short Notes 10 marks

**Model Question Paper**  
**MBBS Degree Examination**  
**II YEAR MBBS**  
**MBS15205 – Pathology – Paper I**

**Time : Three hours**  
**Two hours and forty minutes**  
**For part – B & Part – C**

**Max.Marks : 80**  
**Part - A: 20 marks**  
**Part – B & Part – C: 60 marks**

**Answer all questions**  
**Illustrate the answer with suitable diagram**

**PART - B (30 marks)**

- I. Essay Question : (1x 10 = 10 marks)**
1. Define Necrosis. Discuss the etiopathogenesis, morphological variants and clinical implication of necrosis. **(Must know)**
- II. Write short Notes on : (4 x 5 = 20 marks)**
1. Type IV hypersensitivity **(Must know)**
  2. Arterial and venous thrombus **(May know)**
  3. Teratoma **(May know)**
  4. Radiation injury **(Desirable to know)**

**PART – C (30 marks)**

- I. Essay Question : (1x 10 = 10 marks )**
1. Define leukemia. Elaborate on the WHO classification of leukemias and the morphological variants along with the genetic mutations. **(Must know)**
- II. Write short Notes on : (4 x 5 = 20 marks)**
1. Reed Sternberg cell and its variants **(Must know)**
  2. Thrombocytopenia **(May know)**
  3. Adverse blood transfusion reactions **(May know)**
  4. Red cell indices and their clinical significance **(Desirable to know)**

**PART A**  
**Multiple choice questions (20x01 = 20 marks)**

**Choose the appropriate response**

1. Vitamin A deficiency can lead to **(Must know)**
    - (a) Atrophy of heart muscle
    - (b) Squamous metaplasia of respiratory epithelium
    - (c) Hyperplasia of uterine smooth muscle
    - (d) Hypertrophy of skeletal muscle
  
  2. In leukemia, defective leukocyte function is due to abnormal **(Must know)**
    - (a) Phagocytosis and microbicidal activity
    - (b) Production of leukocytes
    - (c) Chemotaxis                      (d) Adhesion
  
  3. Pulmonary microcirculation shows squamous cells and lanugo hair in **(Must know)**
    - (a) Amniotic fluid embolism                      (b) Pulmonary embolism
    - (c) Caisson disease                                      (d) Fat embolism
  
  4. Contact dermatitis is an example of hypersensitivity reaction: **(Must know)**
    - (a) Type I    (b) Type II
    - (c) Type III    (d) Type IV
  
  5. Secondary wound healing is associated with the following features EXCEPT **(Must know)**
    - (a) A large clot    (b) Minimal wound contraction
    - (c) Intense inflammation    (d) Large amount of granulation tissue
  
  6. Haematoxylin bodies are seen in **(Must know)**
    - (a) Scleroderma    (b) Rheumatoid arthritis
    - (c) Systemic lupus erythematosus    (d) Sjogren syndrome
  
  7. Which of the following is an oncogenic RNA virus? **(Must know)**
    - (a) Human T cell leukemia virus – I    (b) Human papilloma virus
    - (c) Hepatitis B virus    (d) Epstein barr virus
-

8. The childhood tumor secreting catecholamines is, **(May know)**  
(a) Nephroblastoma (b) Neuroblastoma  
(c) Retinoblastoma (d) Hepatoblastoma
9. Hereditary spherocytosis is due to abnormality in **(Must know)**  
(a) RBC Membrane (b) Structure of globin chain  
(c) Quantity of globin chain (d) Red cell enzyme
10. The test done for the ultimate diagnosis of sickle cell anemia is, **(Must know)**  
(a) Peripheral smear examination (b) Haemoglobin electrophoresis  
(c) Sickling test (d) Red cell distribution width
11. The type of acute myeloid leukemia in which treatment with retinoic acid is effective is, **(Must know)**  
(a) M2 (b) M3 (c) M4 (d) M5
12. Identify the false statement regarding Von Willebrand Factor (VWF): **(May know)**  
(a) It is produced by endothelial cells  
(b) Circulated as a complex with F VIII  
(c) It is encoded by the same genes as F VIII Gene  
(d) Deficient of VWF leads to prolonged bleeding time
13. BCR – ABL fusion gene is mainly associated with **(Must know)**  
(a) Acute myeloid leukemia (b) Multiple myeloma  
(c) Chronic lymphocytic leukemia (d) Chronic myeloid leukemia
14. In haemophilia A, **(Must know)**  
(a) Bleeding time is prolonged (b) Prothrombin time is prolonged  
(c) Platelet count is reduced (d) Partial thromboplastin time is prolonged
15. Spontaneous bleeding becomes evident when platelet count falls below **(May know)**  
(a) 20,000/ $\mu$ l (b) 30,000 /  $\mu$ l (c) 40,000 /  $\mu$ l (d) 50,000/ $\mu$ l
16. The common type of necrosis that occur in brain is **(Must know)**  
(a) Coagulative (b) Caseous (c) Fibrinoid  
(d) Liquefactive (e) Fat necrosis.



17. AL amyloid is associated with **(Must know)**  
(a) Tuberculosis (b) Dialysis (c) Candida (d) Blastomycosis
18. Levaditi stain is used to diagnose **(May know)**  
(a) Treponema pallidum (b) Mycobacterium leprae  
(c) Mycobacterium tuberculosis (d) Entamoeba histolitica
19. Globi are seen in **(Must know)**  
(a) Tuberculosis (b) Syphilis (c) Lepromatous leprosy  
(d) Tuberculoid leprosy
20. Normal reticulocyte count in an adult is **(May know)**  
(a) 2-4 % (b) 8-10% (c) 10-12 % (d) 0.2-2% (e) 6-8 %

**Model Question Paper**  
**MBBS Degree Examination**  
**II YEAR MBBS**  
**MBS15206 – Pathology – Paper II**

**Time : Three hours**  
**Two hours and forty minutes**  
**For part – B & Part – C**

**Max.Marks : 80**  
**Part A : 20 marks**  
**Part – B & Part – C : 60 marks**

**Answer all questions**  
**Illustrate the answer with suitable diagram**

**PART - B (30 marks)**

**I. Essay Question :** (1x 10 = 10 marks )

1. Describe the etiopathogenesis, morphology and complications of atherosclerosis. **(Must know)**

**II. Write short Notes on :** (4 x 5 = 20 marks)

1. Polyps of Intestine **(Must know)**
2. Types of cardiomyopathy **(May know)**
3. Small cell carcinoma of lung **(May know)**
4. Barrett's oesophagus **(Desirable to know)**

**PART – C (30 marks)**

**I. Essay Question:** (1x 10 = 10 marks)

1. Define and classify cirrhosis. Describe the morphology of alcoholic cirrhosis. List the complications of cirrhosis **(Must know)**

**II. Write short Notes on:** (4 x 5 = 20 marks)

1. Lab diagnosis of common types of meningitis **(Must know)**
2. Fibrocystic disease of breast **(May know)**
3. Gout **(May know)**
4. Paget's disease **(Desirable to know)**

**PART A**  
**Multiple choice questions (20x01 = 20 marks)**

**Choose the appropriate response**

1. In which of the following conditions is non pitting oedema seen? **(Must know)**  
(a) Myxoedema (b) Cardiac oedema  
(c) Renal oedema (d) Pulmonary oedema
2. Leiomyoma is a tumor of **(May know)**  
(a) Smooth muscle cells (b) Fibroblasts  
(c) Striated muscle cells (d) Primitive mesenchyme
3. The so called Madura foot is **(May know)**  
(a) A slowly progressive unilateral infection of subcutaneous tissue of foot  
(b) Characterized by chronicity  
(c) Characterized by pus formation (d) All of the above
4. Mac Callum's patch is found in **(Must know)**  
(a) Mitral stenosis (b) Mitral insufficiency  
(c) Systemic lupus erythematosus (d) Acute rheumatic fever
5. Leather bottle stomach is a result of **(Must know)**  
(a) Hypertrophic gastritis (b) Ulcerative carcinoma  
(c) Polypoid carcinoma (d) Diffuse carcinoma
6. This non endocrine tumor is known to secrete hormones **(May know)**  
(a) Oat cell carcinoma of lung (b) Rhabdomyosarcoma of uterus  
(c) Carcinoma of stomach (d) Adenomatoid tumour of the testis  
(e) Bronchopneumonia (f) Necrotizing haemorrhagic interstitial pneumonitis
7. All of the following can be termed immune complex disease of kidney EXCEPT  
**(Must know)**  
(a) Post streptococcal Glomerulonephritis (b) L.E Glomerulonephritis  
(c) Anti glomerular basement membrane antibody glomerulo nephritis  
(d) Membranous glomerulo nephritis
8. "Piecemeal" necrosis is seen in **(May know)**  
(a) Chronic active hepatitis (b) Alcoholic cirrhosis  
(c) Indian childhood cirrhosis (d) Chronic pancreatitis

9. Mycotic aneurysms are due to **(Must know)**  
(a) Fungus (b) Viral infections  
(c) Bacterial infection and septicemia (d) All of the above
10. Alpha I anti trypsin deficiency is usually associated with **(Must know)**  
(a) Pulmonary emphysema (b) Fatty liver  
(c) Intestinal malabsorption (d) All of the above
11. The valves most commonly affected in rheumatic heart disease **(Must know)**  
(a) Mitral and tricuspid (b) Tricuspid and pulmonic  
(c) Pulmonic and aortic (d) Mitral and aortic
12. Massive splenomegaly is seen in **(May know)**  
(a) Pernicious anemia (b) Typhoid  
(c) Myelofibrosis (d) Chronic valvular disease of heart
13. Russell bodies are seen in **(Must know)**  
(a) Plasma cells (b) Lymphocytes  
(c) Neutrophils (d) Macrophages
14. Triphenyl Tetrazolium chloride is used in the diagnosis of **(Must know)**  
(a) Rheumatic vegetation (b) Infective endocarditis  
(c) Syphilitic heart disease (d) Myocardial infarction
15. The stain used to diagnose Helicobacter pylori is **(Must know)**  
(a) Alcian blue (b) Fite - Faracco  
(c) Warthin starry (d) Congo red
16. Malignant transformation is 100% in **(Must know)**  
(a) Villous adenoma (b) Tubular adenoma  
(c) Familial polyposis (d) Peutz Jegher's syndrome
17. Reid index is a term used to diagnose **(Must know)**  
(a) Bronchiectasis (b) Chronic bronchitis  
(c) Emphysema (d) Bronchogenic carcinoma
18. A Flea – Bitten kidney is seen in **(Must know)**  
(a) Malignant nephrosclerosis (b) Benign nephrosclerosis  
(c) Chronic pyelonephritis (d) Amyloidosis

19. All are gall stones except **(Must know)**
- |                       |                          |
|-----------------------|--------------------------|
| (a) Cholesterol       | (b) Calcium bilirubinate |
| (c) Calcium carbonate | (d) Sodium dithionate    |
20. A better prognosis in a hepatocellular carcinoma is seen in **(Must know)**
- |                        |                           |
|------------------------|---------------------------|
| (a) Clear cell variant | (b) Pseudo glandular type |
| (c) Fibrolamellar type | (d) Schirrhous type.      |

### **BOOKS RECOMMENDED**

1. General and systematic Pathology by JC. Underwood. 6<sup>th</sup> Edition, Churchill Livingstone, 2013.
2. Pathology by Rubin and Faber. 7<sup>th</sup> Edition, Lippincott, 2014.
3. Basic Pathology by Robbins, 8<sup>th</sup> Edition, Elsevier Publication, 2007.
4. Pathologic Basis of the Diseases by Robbins, 9<sup>th</sup> Edition, Jaypee Publication, 2014.
5. Textbook of Haematology by Shirley Mckenzie. 2<sup>nd</sup> edition, Lippincott, 1996.
6. Essential Haematology by AV Hoffbrand, 6<sup>th</sup> Edition, Black well, 2011.

*Integrity without knowledge is weak and useless, and knowledge without integrity is dangerous and dreadful*

*-Samuel Johnson*

## **FORENSIC MEDICINE CURRICULUM**

### **Goal**

The goal of teaching Forensic medicine to undergraduate students is to impart knowledge of legal procedures involved in medical practice and to apply the knowledge of medical science for the purpose of ensuring justice in courts of law. Further the teaching will help the students to know of medical ethics and etiquette to be followed during the practice of medicine. As it is a well known fact that the medical service become vulnerable to be criticized day to day by the litigatory society, a medical student should be prepared to practice medicine without being entangled either by professional, criminal or consumer law. Hence the knowledge in forensic medicine is most essential and useful and it can be gained only during their studentship.

### **Objectives**

#### **Knowledge**

At the end of the course the student will be able to

- (a) Appear in a Court of law as a Registered Medical Practitioner and give evidence in cases of homicide, assault, sexual offences, alcoholic intoxication, drug dependence and other cases requiring medical opinion.
- (b) Practice medicine in the society following medical ethics and etiquette as prescribed by the Medical Council of India.

#### **Skills**

- (a) To conduct autopsy on medico-legal cases and issue postmortem certificates; to examine cases of wounds (assault, homicide etc.) at the hospital and issue required medico-legal certificates (wound certificates).
- (b) To treat cases of poisoning and issue certificates to the court and the police.
- (c) Integration

The student will be able to integrate and apply his/her knowledge of anatomy, physiology, biochemistry, pathology, microbiology, medicine, surgery and obstetrics and gynaecology for the purpose of legal procedures and execution of justice.

## SYLLABUS

1. Introduction; History; legal procedures in India; medical and medico legal documents; evidences, witnesses; types and powers of Court; laws related to medical profession.
2. Historical aspects of medical ethics and Medical Council of India, State Medical Council: structure, functions, powers; duties of medical practitioners towards patients and relatives, State, teachers and colleagues; consent: definition, types, application in medical practice; medical negligence: civil, criminal; Consumer Protection Act: rights and liabilities of doctors, medical indemnity insurance; human rights and violation; duties of medical practitioners to victims of torture; Human organ transplantation Act.
3. Identification of the living and the dead.
4. Forensic thanatology; death; causes of death; mechanism and manner of death; changes after death; artifacts; medicolegal death investigation; exhumation.
5. Traumatic pathology; general aspects and classification; mechanical injuries; regional injuries; thermal injuries; injuries due to electricity, lightning and radiation; train and road traffic accidents; firearm and explosion injuries; medicolegal aspects of wounds.
6. Asphyxia; general aspects; patho-physiology and classification; mechanical asphyxia; hanging; strangulation; drowning; smothering, choking, garroting, burking, yoking.
7. Sexual jurisprudence; virginity, pregnancy, delivery, assisted pregnancy; impotence, sterility, artificial insemination; medical termination of pregnancy; Prenatal sex determination Act; abortion; infanticide; child abuse; S.I.D.S (sudden infant death syndrome) ; sexual offences.
8. Forensic science; Locard's exchange principle; lie detector; superimposition; D.N.A. finger printing.

### **Forensic Psychiatry:**

Mental Health Act, common mental illness, laws in relation to mental illness, restraint, admission, assessment, care and discharge, important symptomatology and applied Forensic Medicine, civil and criminal responsibilities of insane person, differences between true and feigned insanity.

### **Toxicology**

General aspects and Classification of Poisons - Definition of toxicology, toxinology, poison, medicine, toxidrome, packidrome, toxico dynamics & toxicokinetics, antidotes, factors modifying the action of poisons, corrosives, irritants, neurotoxics, somniferous, inebriants, deliriant, spinal, peripheral, cardiac, asphyxiants, miscellaneous, drug dependence, drug abuse.

# Must know

## 1. Legal Procedure

- i. Introduction, legal terms, courts, inquest
- ii. Evidence in court, medical evidence, dying declaration
- iii. Witness, doctor in witness box, exhumation

## 2. Medical Ethics

- i. Introduction, MCI, SMC, functions
- ii. RMP, duties, privileges
- iii. Infamous conduct, misconduct, punishment, appeal
- iv. Malpractice, negligence, CPA,
- v. Consent, relevance
- vi. Euthanasia

## 3. Forensic Pathology

### a. Forensic Identity

- i. Introduction, definition, types,
- ii. Determine age and sex in living and dead
- iii. ML importance of age

### b. Thanatology

- i. Introduction, types of death, somatic, molecular, brain stem
- ii. moment of death, sudden death
- iii. PM changes: immediate, early, late, adipocere, mummification
- iv. ML Importance of death and changes after death
- v. Brain death

### c. Medicolegal Autopsy

- i. Objectives, rules, negative autopsy

### d. Asphyxial Deaths

- i. Introduction, pathophysiology, signs, symptoms
- ii. Hanging: definition, types, causes of death, PM findings, MLI
- iii. Strangulation, suffocation, traumatic asphyxia: definition, types, causes of death, PM findings, MLI



- iv. Drowning: definition, types, mechanism, causes of death, PM findings, diatom test, MLI

#### **4. Clinical Forensic Medicine**

##### **a. Trauma / Mechanical injuries 8**

- i. Introduction, definition, injury, hurt, classification
- ii. Blunt force trauma: abrasions, contusions, lacerations, complications, MLI
- iii. Sharp force trauma: incised, stab, chop wounds, complications, MLI
- iv. Head injury: mechanism, scalp, skull, brain, spinal, intra-cranial hemorrhages
- v. Road Traffic Accidents, Burns, Scalds, Electrocutation, Lightning
- vi. Medicolegal aspects

##### **b. Sexual Jurisprudence**

- i. Virginity, pregnancy, MTP, criminal abortion, delivery, paternity, impotence, sterility, incest: Explanation, MLI
- ii. Rape, sodomy: examination, details

##### **c. Infanticide**

- i. Viability, Haase's Rule, live birth, dead birth, still birth, tests, time of survival, cause of death: examination, explanation
- ii. Battered baby syndrome, Sudden infant death syndrome

##### **d. Forensic Psychiatry**

- i. Insanity, feigned insanity, McNaughten rules
- ii. Civil and criminal responsibilities of insane

#### **5. Toxicology**

##### **a. General Principles**

- i. Toxicology, poison, epidemiology
- ii. ML aspects, laws, schedules, IPC, duty of doctor
- iii. General diagnosis and management
- iv. Preservation and dispatch of viscera
- vii. Classification

**b. Corrosives**

- i. Inorganic: H<sub>2</sub>SO<sub>4</sub>, HNO<sub>3</sub>, HCl
- ii. Organic: Phenol, oxalic acid, formic acid

**c. Irritants**

- i. Inorganic non-metallic: phosphorus, halogens
- ii. Inorganic metallic: lead, mercury, copper, iron
- iii. Organic vegetable: abrus, castor, croton, calotropis, semicarpus, ergot
- iv. Organic animal: insects, bees, wasp, scorpion, snake: diagnosis, management
- v. Mechanical

**d. Somniferous**

Opium,

**e. Sedative Hypnotics**

barbiturates

**f. Deliriant**

Dhatura, cannabis, cocaine

**g. Insecticides**

OPC, OCC, carbamates, pyrethroids, celphos

**h. Cardiac/Spinal**

Oleander, aconite, tobacco, strychnine

**i. Asphyxiants**

Cyanides, CO, CO<sub>2</sub>

**j. Domestic/Household poisons**

Kerosene, disinfectants, cosmetics, cleansing agents

**k. Therapeutic drug toxicity**

Salicylates, paracetamol, antidepressants, antipsychotics

**m. Drug Abuse**

# May know

## 1. Medical Ethics

Medical Indemnity Insurance

## 2. Forensic Pathology

### Forensic Identity

Introduction, definition, types, corpus delicti, odontology

DNA finger printing, Superimposition

### Thanatology

Organ transplantation

### Medicolegal Autopsy

Skeletal remains examination

### Trauma / Mechanical injuries

Firearm injuries: PM, examination, injury, death, collection and preservation bullets.

## 3. Forensic Psychiatry

Psychosis, Neurosis, restraint of insane

### IPC & CrPC relating to Medicine

## 4. Toxicology

### a. General Principles

Occupational, environmental toxicology

### b. Food Poisoning

Bacterial, viral, chemical, mushrooms

c. war gases, ichthyotoxism

# Desirable to know

## 1. Introduction & Jurisprudence

### a. Introduction

Synonyms, history, modern, divisions

### b. Legal Procedure

Workman's compensation act, ESI Act, The Protection of Human Rights Act

## 2. Medicolegal Autopsy

Procedure & dissection technique

## 3. Forensic Science Laboratory

Brain mapping, polygraphy, narcoanalysis

## 4. Forensic Psychiatry

ICD classification of Mental Health diseases, Mental health act 1987

## 5. Toxicology

### a. General Principles

Analytical toxicology: bedside and common lab tests, TLC, HPLC, GC, UVS

### b. Inebriants:

Ethylene Glycol, Isopropanol, Benzodiazepines

# **Practicals**

## **1. Objectives:**

- a. Observations and inferences in Medico legal cases
- b. Observation and interpretation of post mortem findings
- c. Observation of medical ethics
- d. Diagnosis and treatment of common poisoning emergencies

## **2. Exercises:**

- a. Post-mortem certificate
- b. Age estimation from X-ray
- c. Injury certificate
- d. Drunkenness certificate
- e. Death certificate
- f. Potency certificate
- g. Viscera Analysis
- h. Examination of rape victim
- i. Examination of rape accused
- j. Toxicology case
- k. Practical problems

## SYLLABUS IN FORENSIC MEDICINE

Theory	Time	Practical	Time
<b>UNIT I</b>			
INTRODUCTION HISTORY LEGAL PROCEDURES IN INDIA	1hr	-	-
-----			
MEDICAL & MEDICO LEGAL DOCUMENTS EVIDENCES,WITNESSES TYPES & POWERS OF COURT	1hr	-	-
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LAWS RELATED TO MEDICAL PROFESSION	1hr		
<b>UNIT II</b>			
HISTORICAL ASPECTS OF MEDICAL ETHICS& MEDICAL COUNCIL OF INDIA / STRUCTURE STATE MEDICAL COUNCIL / FUNCTIONS POWERS	1hr	-	-
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DUTIES OF MEDICAL PRACTITIONERS TOWARDS PATIENTS & RELATIVES STATE TEACHERS & COLLEAGUES	2 hrs	-	-
-----			
CONSENT → DEFINITION → TYPES → APPLICATION IN MEDICAL PRACTICE	1hr	-	-
-----			
MEDICAL NEGLIGENCE → CIVIL → CRIMINAL	1hr	-	-
-----			
CONSUMER PROTECTION ACT RIGHTS & LIABILITIES OF DOCTORS MEDICAL INDEMNITY INSURANCE	1hr	-	-
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HUMAN RIGHTS & VIOLATION DUTIES OF MEDICAL PRACTITIONER TO VICTIMS OF TORTURE HUMAN ORGAN TRANSPLANTATION ACT	1hr	-	-

<u>UNIT III</u> INDENTIFICATION OF LIVING DEAD	2hrs 1hr	I AGE ESTIMATION BY 1.DENTITION 2.OSSIFICATION II EXAMINATION OF SKELETAL REMAINS	2 hrs 4 hrs 4 hrs
<u>UNIT IV</u> FORENSIC THANATOLOGY DEATH CAUSES OF DEATH MECHANISM & MANNER OF DEATH CHANGES AFTER DEATH ARTIFACTS MEDICOLEGAL DEATH INVESTIGATION EXHUMATION	1hr 1hr 1hr 4 hrs 1hr  1hr	MEDICOLEGAL AUTOPSY DEMONSTRATION	5 hrs
<u>UNIT V</u> TRAUMATIC PATHOLOGY GENERAL ASPECTS & CLASSIFICATION MECHANICAL INJURIES REGIONAL INJURIES THERMAL INJURIES ----- INJURIES DUE TO ELECTRICITY, LIGHTENING AND RADIATION ----- TRAIN & ROAD TRAFFIC ACCIDENTS FIREARM & EXPLOSION INJURIES MEDICOLEGAL ASPECTS OF WOUNDS	1hr  2 hrs 4 hrs 2 hrs  1hr  1hr 4 hrs 1hr	MEDICAL MANAGEMENT &LEGAL RESPONSIBILITIES OF MEDICAL PRACTITIONER TOWARDS INJURED VICTIMS. (CASUALTY)  ACCIDENT REGISTER & WOUND CERTIFICATE	4 hrs
<u>UNIT VI</u> ASPHYXIA GENERAL ASPECTS, PATHOPHYSIOLOGY AND CLASSIFICATION ----- MECHANICAL ASPHYXIA: HANGING, STRANGULATION, ----- DROWNING, SMOTHERING, CHOKING, GARROTING, BURKING YOKING	1 hr  2 hrs  1 hr 1 hr		
<u>UNIT VII</u> FORENSIC PSYCHIATRY 1. DEFINITION AND DESCRIPTION OF PSYCHIATRIC SYMPTOMS BEARING LEGAL ISSUES			

2. METHODS OF RESTRAINING MENTALLY ILL IN ASYLUM -----	1 hr		
3. CIVIL & CRIMINAL RESPONSIBILITY OF MENTALLY ILL PERSON 4. LAWS IN RELATION TO MENTAL ILLNESS	1 hr		
<u>UNIT VIII</u> SEXUAL JURISPRUDENCE: VIRGINITY,PREGNANCY,DELIVERY, ASSISTED PREGNANCY ----- IMPOTENCE, STERILITY, ARTIFICIAL INSEMINATION ----- MEDICAL TERMINATION OF PREGNANCY PRENATAL SEX DETERMINATION ACT ----- ABORTION ----- INFANTICIDE CHILD ABUSE S.I.D.S SEXUAL OFFENCES	1 hr  1hr  1hr  1hr  3 hrs	FOETAL EXAMINATION ----- EXAMINATION OF VICTIM, ACCUSED IN RAPE CASES	2 hrs  2 hrs



<u>UNIT IX</u> FORENSIC SCIENCE: LOCARD'S EXCHANGE PRINCIPLE LIE DETECTOR SUPERIMPOSITION D.N.A FINGER PRINTING ----- TRACE EVIDENCES	2 hrs         1hr		
<u>UNIT X</u> TOXICOLOGY: GENERAL ASPECTS & CLASSIFICATION ----- CORROSIVE POISONS ----- IRRITANT POISONS ----- NEURAL POISONS SOMNIFEROUS INEBRIENT ----- DELIRIENT SPINAL PERIPHERAL ----- CARDIAC POISONS ASPHYXIANTS DRUG ABUSE MISCELLANEOUS	2 hrs     1hr    3 hrs    1hr 1hr    1hr    1hr 1hr 1hr 1hr	EXAMINATION OF DRUNKENNESS ----- SPOTTER EXAMIANTION ----- COLLECTION, PRESERVATION AND PACKING OF VISCERA	4 hrs  4 hrs                2 hrs

Total: 70 hrs

Total: 33 hrs

**UNIVERSITY EXAMINATION PATTERN**  
**FORENSIC MEDICINE & TOXICOLOGY**

**Forensic Medicine Mark Distribution**

**Existing pattern:**

**I. Theory**

1. MCQ'S	:	20
2. Long essays (2)	:	20
3. Short essays (5)	:	20
4. Ultra short notes (10)	:	20
Grand Viva	:	20

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Total            100  
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**50 % must for passing**

**II. Practicals**

Major exercise	:	20
Minor exercise	:	40

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60  
-----

**III. Internal assessment**

Theory	:	20
Practical	:	20

-----  
40  
-----

**Total = 100**

**50 % for passing**

**MBBS DEGREE EXAMINATION**  
**II YEAR MBBS**  
**FORENSIC MEDICINE**

**Time: 3 hrs**  
**Two hours and forty minutes**  
**For Part-B, Part-C & Part-D**

**Max. Marks: 80**  
**PART-A : 20 Marks**  
**For Part-B, Part-C & Part-D : 60 Marks**

**Multiple Choice Questions**

**PART – A**

**(20 x 1 = 20 Marks)**

Must know – 12

May know – 06

Desirable to know - 02

**PART – B**

**I. Essay Questions:**

**(2 x 10 = 20 marks)**

1. (Must know)
2. (May know)

**PART – C**

**(5 x 4 = 20 marks)**

**II. Write short essays on:**

1. (Must know)
2. (Must know)
3. (Must know)
4. (May know)
5. (May know)

**PART – D**

**III. Write short notes on:**

**(10 x 2 = 20 marks)**

1. (Desirable to know)
2. (Must know)
3. (Desirable to know)
4. (Must know)
5. (Desirable To Know)
6. (may know)
7. (may know)
8. (may know)
9. (Desirable to know)
10. (Must know)

**MODEL QUESTION PAPER**  
**MBBS DEGREE EXAMINATION**  
**II YEAR MBBS**  
**MBS15207- FORENSIC MEDICINE & TOXICOLOGY**

Time: 3 hrs  
Two hours and forty minutes  
For Part-B, Part-C & Part-D

Max. Marks: 80  
PART-A : 20 Marks  
For Part-B, Part-C & Part-D : 60 Marks

**PART – A**  
**MCQ – 20 x 1 = 20 Mark marks**

**Use OMR Coding sheets for answering PART – A**  
**Use separate answer Books for PART- B, PART-C & Part-D**

Answer **ALL** questions  
Illustrate the answer with suitable diagrams

**PART – B**

**I. Essay Questions:** (2 x 10 = 20 marks)

1. Define asphyxia (2 marks)  
How mechanical asphyxia is classified (3 marks)  
Write the postmortem findings in a case of hanging (5 marks) (**Must know**)
2. Define time of death (2 marks)  
Describe the postmortem changes which are useful to estimate how long ago death would have occurred (7 marks) (**May know**)

**PART – C**

**II. Write short essays on:** (5 x 4 = 20 marks)

1. Define consent (1 mark)  
Mention the important applications of consent in medical practice (3 marks) (**Must know**)
2. What is inquest (1 mark)  
Write briefly about magistrate inquest (3 marks) (**Must know**)
3. Define antidote (1 mark)  
Write briefly about different types of antidotes with suitable examples (3 marks) (**Must know**)
4. Define a poison (1 mark)  
How will you treat a case of cyanide poisoning (3 marks) (**May know**)
5. Define delusion (1 mark)  
Enumerate the types of delusions (3 marks) (**May know**)

## PART – D

### III. Write short notes on:

(10 x 2 = 20 marks)

11. Dichotomy (**Desirable to know**)
12. Contributory negligence (**Must know**)
13. Types of Incision in Post Mortem Examination (**Desirable to know**)
14. Suspended animation (**Must know**)
15. Sternal index (**Desirable To Know**)
16. Peeping tom (**may know**)
17. Precipitate labour (**may know**)
18. Quod (**may know**)
19. NarcoAnalysis (**Desirable to know**)
20. Carboluria (**Must know**)

### **Multiple Choice Questions**

#### PART A

**Use OMR Coding sheets for answering** Marks: 20 X 1 = (20 MARKS)

1. The ideal site to measure the temperature of dead body is (**MUST KNOW**)  
A. Mouth  
B. Nose  
C. Axilla  
D. Rectum
2. The earliest sign of decomposition is (**MUST KNOW**)  
A. Putrid purging  
B. Greenish blue hue over abdomen  
C. Skin slippage  
D. Marbling
3. Increase of body temperature after death occurs in the following conditions except (**MUST KNOW**)  
A. Strychnine poisoning  
B. Pontine haemorrhage  
C. Heat stroke  
D. Starvation
4. The best body fluid for chemical estimation of time since death is (**DESIRABLE TO KNOW**)  
A. C.S.F  
B. Serous fluid  
C. Pericardial fluid  
D. Vitreous humor
5. Leading questions are allowed in (**MUST KNOW**)  
A. Chief examination  
B. Cross examination  
C. Re examination  
D. Court questioning

6. The most reliable of bone of human skeleton to determine sex is **(MUST KNOW)**
- |             |           |
|-------------|-----------|
| A. Skull    | B. Pelvis |
| C. Mandible | D. Femur  |
7. "XXY" pattern of sex chromosome is seen in **(May know)**
- |                      |                           |
|----------------------|---------------------------|
| A. Hermaphrodites    | B. Pseudo hermaphrodites  |
| C. Turner's syndrome | D. Klinefelter's syndrome |
8. Brush burn is a type of **(MUST KNOW)**
- |                      |                      |
|----------------------|----------------------|
| A. Mechanical injury | B. Chemical injury   |
| C. Thermal injury    | D. Electrical injury |
9. Black gun powder is composed of all the following except **(DESIRABLE TO KNOW)**
- |                    |                      |
|--------------------|----------------------|
| A. Sulphur         | B. Potassium nitrate |
| C. Nitro cellulose | D. Charcoal          |
10. Surest sign of antemortem drowning is **(MUST KNOW)**
- |                      |                         |
|----------------------|-------------------------|
| A. Cutis anserina    | B. Pink forth over nose |
| C. Washer women skin | D. Water in stomach     |
11. Split lacerations are usually seen over except **(MUST KNOW)**
- |         |              |
|---------|--------------|
| A. Chin | B. Fore head |
| C. Shin | D. Buttock   |
12. The green colour of a healing contusion is due to **(MAY KNOW)**
- |                |                 |
|----------------|-----------------|
| A. Haemoglobin | B. Haemosiderin |
| C. Biliverdin  | D. Bilirubin    |
13. Lucid interval is more commonly seen in **(MUST KNOW)**
- |                              |                              |
|------------------------------|------------------------------|
| A. Epidural haemorrhage      | B. Sub dural haemorrhage     |
| C. Sub arachnoid haemorrhage | D. Intracerebral haemorrhage |
14. "Kleptomania" is a type of **(MAY KNOW)**
- |             |                  |
|-------------|------------------|
| A. Delusion | B. Hallucination |
| C. Illusion | D. Impulse       |
15. Incessant sexual desire in a male is **(MAY KNOW)**
- |               |                  |
|---------------|------------------|
| A. Priapism   | B. Satyriasis    |
| C. Anorgasmia | D. Sadomasochism |
16. One of the following plant poison is an ideal cattle poison **(MAY KNOW)**
- |                      |                       |
|----------------------|-----------------------|
| A. Nerium odorum     | B. Calatropis procera |
| C. Abrus precatorius | D. Cerbra thevetia    |

17. "Burtonian line" is classically seen in chronic poisoning with **(MAY KNOW)**  
A. Arsenic  
B. Lead  
C. Mercury  
D. Copper
18. Age estimation by Gustafson's method is done more reliably with **(MUST KNOW)**  
A. Attrition  
B. Secondary dentin  
C. Root transparency  
D. Root resorption
19. The tear in one of the following sites of hymen is an absolute proof of coitus **(MUST KNOW)**  
A. 12 o'clock position  
B. 2 o'clock position  
C. 9 o'clock position  
D. 7 o'clock position
20. The surest sign of death is **(MUST KNOW)**  
A. Absence of corneal reflex  
B. Absence of breathing  
C. Discoloration of right iliac fossa  
D. Absence of heart beat

## **PRACTICAL SCHEME OF EXAMINATIONS**

Total = 60 marks

### **Part – I**

20 marks each. Only one exercise for one student (on lot basis)

1. Skeletal remains examination – Biological profile for each bone
2. Age estimation from dentition
3. Age determination from ossification
4. Injury examination – accident register and wound certificate
5. Drunkenness – examination and issuance of certificate
6. Sexual offence – examination of victim / accused

### **Part – II**

(10+5+5 = 20 marks)

1. Foetal examination
2. Death certificate
3. Viscera packing

### **Part – III**

(Spotters 10 x 2 = 20 marks)

Toxicology - 5 (1Plant, 1Animal, 1Seed, 1Chemical, 1Wet Specimen)  
Traumatology - 2 (1Weapon, 1 Wet specimen)  
Pathology - 1 Wet specimen  
Identification - 1 Specimen  
Either a photo or slide for microscopy - 1



## Marks Distribution in Forensic Medicine

Theory – Total 100 marks

Section –A

MCQ (20) -----→ 20 marks

Section – B

Two essay questions (10 marks each) -----→ 20 marks

Section – C

Five short essays (4 marks each) -----→ 20 marks

Section – D

Ten short notes (2 marks each) -----→ 20 marks

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80  
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50 % Minimum for pass (40 marks)

Internal Assessment – 40. 35% for eligibility to appear exam (14 marks)

Practical Examination - 60. 50 % Minimum for pass (30 marks)

Internal Assessment

(Theory 20 & practical 20) - 40

-----  
100  
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### Overall 50% required for pass

Theory (Including MCQ)	} -	80	
Practical	-	60	
Viva	-	20	
Internal Assessment	-	40	
		-----	
Total		200	50% (100 marks)
		-----	

**INTEGRATED TEACHING:**

S.No	Topic	With Departments of:
1	Wound management	Casualty, surgery, Orthopaedics
2	Management of snake bite	Casualty, Medicine, simulation lab
3	Medico legal Documentation	Medicine, Surgery, Obstetric & Gynaecology , Orthopaedics
4	Medico legal perspectives of Medical Emergencies	Casualty, Medicine, Orthopaedics
	Muscle	Anatomy, physiology, Biochemistry, Neurology
5	Heart	Anatomy, physiology, Biochemistry, Pathology, Cardiology
6	Medico legal perspectives of Drug dependence	Pharmacology
7	Medico legal perspectives of Consent in Medical Practice	Medicine
8	Bio Medical ethics	Medicine, Surgery, Obstetric & Gynaecology , Orthopaedics
9	Medico legal perspectives of treating a case of suspected Poisoning	Pharmacology, Casualty, Medicine
10	Medico legal perspectives of HIV	Microbiology, Pathology, Pharmacology
11	Medico legal perspectives of sudden cardiac death	Pathology, Medicine
12	Stroke	Anatomy, Physiology, Pathology, Medicine, Biochemistry, Radiology, Neurology.
13	Suppurative Lung Disease	Anatomy, Pathology, Medicine, Microbiology, Radiology, Pulmonary medicine, cardio thoracic
14	Applied Forensic Medicine - Tuberculosis	Pathology, Microbiology, Pharmacology, Forensic Medicine

**TEACHING SCHEDULE- THEORY CLASSES****II MBBS –Batch**

<b>S. No</b>	<b>Theory Class</b>	<b>Topic</b>
1	1-2 pm	Introduction –Forensic Medicine
2	1-2 pm	Introduction to legal procedure at an inquest,
3	1-2 pm	Legal procedure - Criminal courts and their powers and procedures
4	1-2 pm	Medical evidence, Types of witness
5	1-2 pm	Examination of a medical witness in the court, Conduct and duties of doctor in the witness box
6	1-2 pm	Mock Trial
7	1-2 pm	Procedures of examination of the body at the scene of crime, criminal trial.
8	1-2 pm	Medical law and Ethics-functions of medical councils, code of medical ethics, infamous conduct
9	1-2 pm	Rights and duties of medical practitioners, physician's responsibility in criminal matters
11	1-2 pm	Professional negligence
16	1-2 pm	Vicarious liability, Medical records, Products liability, Medical indemnity, insurance
17	1-2 pm	Euthanasia, consent in Medical practice, medical experimentation. Malingering. Consumer protection Act & Consumer courts.
18	1-2 pm	S E M N A R – Batch I
19	1-2 pm	S E M N A R – Batch II
20	1-2 pm	Identification of the living
21	1-2 pm	Identification –Introduction
22	1-2 pm	Identification of the living – remaining
23	1-2 pm	Medico legal Autopsy. Aims & Objectives _Rules for autopsies
24	1-2 pm	Autopsy of a dead body of decomposed and mutilated bodies ; Preservation of viscera for chemical analysis, Artefact
26	1-2 pm	Skeletal remains, Exhumation, Death from starvation
27	1-2 pm	Thanatology –Introduction
28	1-2 pm	Death -modes of death, causes of death, sudden death
29	1-2 pm	Postmortem changes – Medico legal aspects of death – Immediate, early signs of death –Part I

31	1-2 pm	Postmortem changes – Medico legal aspects of death – Late signs of death –Part II
34	1-2 pm	Changes following death with special reference to time since death
35	1-2 pm	Mechanical Injuries –Introduction
36	1-2 pm	Mechanical Injuries II – Abrasion , Contusion
37	1-2 pm	Mechanical Injuries III – Laceration, Incised & stab wound
38	1-2 pm	Medico legal aspects of wound & Sections dealing with Injuries
39	1-2 pm	Traffic accidents ,Regional injuries
40	1-2 pm	Ballistics
	1-2 pm	Thermal injuries, electricity and lightning.
41	1-2 pm	Mechanical asphyxia- Introduction, Classification
42	1-2 pm	Death due to mechanical asphyxia- Hanging, strangulation
43	1-2 pm	Death due to mechanical asphyxia- suffocation, smothering, Traumatic Asphyxia, Café coronary & others.
46	1-2 pm	Death due to mechanical asphyxia- Drowning
47	1-2 pm	Deaths due to Mechanical Asphyxia – Autopsy Video Demonstration
48	1-2 pm	Impotence, sterility, Artificial insemination, surrogacy
49	1-2 pm	Types of Hymen, Medico legal aspects of - Virginit
50	1-2 pm	Pregnancy - signs & its Medico legal Importance
51	1-2 pm	Disputed Paternity, legitimacy.Signs of Recent Delivery in living & dead – MLI
52	1-2 pm	Sexual Jurisprudence –Sexual Offences – Introduction, Unnatural offences, sexual perversions.
53	1-2 pm	Abortion, MTP act
56	1-2 pm	Infanticide- Introduction –Live birth, stillbirth, dead born
57	1-2 pm	Forensic Psychiatry
58	1-2 pm	Forensic Toxicology –Introduction
59	1-2 pm	Forensic Toxicology – General Considerations
60	1-2 pm	Forensic Toxicology – Corrosives
61	1-2 pm	Forensic Toxicology – Irritants
62	1-2 pm	Forensic Toxicology – Agricultural Poison-OPC
63	1-2 pm	R E V I S I O N - Forensic Toxicology
64	1-2 pm	R E V I S I O N – Forensic Medicine –PART I
65	1-2 pm	R E V I S I O N - Forensic Medicine –PART II

**TEACHING SCHEDULE**  
**II MBBS - PRACTICAL CLASSES**

S. No	Time	Topic
1.	2- 4 pm	Introduction
2.	2- 4 pm	Introduction
3.	2- 4 pm	Examination of Skeletal remains
4.	2- 4 pm	Medico legal Autopsy. Aims & Objectives _Rules for autopsies
5.	2- 4 pm	Medico legal Autopsy
6.	2- 4 pm	Examination of a medical witness in the court, Conduct and duties of doctor in the witness box
7.	2- 4 pm	Examination of Skeletal remains
8.	2- 4 pm	Mock trial
9.	2- 4 pm	Identification of the living – Radiological Examination
10.	2- 4 pm	Identification of the living – Ossification centers
11.	2- 4 pm	Examination of Skeletal remains
12.	2- 4 pm	Identification of the dead- Dentition
13.	2- 4 pm	Identification of the dead- Dentition
14.	2- 4 pm	Identification of the living – Radiological Examination
15.	2- 4 pm	Autopsy of a dead body of decomposed and mutilated bodies
16.	2- 4 pm	MUSEUM SPECIMENS
17.	2- 4 pm	Autopsy
18.	2- 4 pm	Examination of wound- Accident Register, wound Certificate
19.	2- 4 pm	Examination of wound- Accident Register, wound Certificate
20.	2- 4 pm	Examination of wound- Accident Register, wound Certificate
21.	2- 4 pm	Medico legal aspects of wound & Sections dealing with Injuries
22.	2- 4 pm	Mechanical asphyxia- Hanging, strangulation
23.	2- 4 pm	Mechanical asphyxia- drowning
24.	2- 4 pm	Death due to mechanical asphyxia- Hanging, strangulation, suffocation, drowning etc.
25.	2- 4 pm	Photographs
26.	2- 4 pm	Examination of Victims of Sexual Offences – Rape
27.	2- 4 pm	Examination of Accused of Sexual Offences – Rape
28.	2- 4 pm	Spotters & Specimens – Injuries, Ballistics
29.	2- 4 pm	Photographs , Spotters & Specimens – Asphyxia
30.	2- 4 pm	R E V I S I O N

31.	2- 4 pm	P R A C T I C A L T E S T – Long Cases I, II, III, IV, V
32.	2- 4 pm	Foetal Examination
33.	2- 4 pm	Infanticide: Signs of Live birth- Live birth, stillbirth, dead born- Maceration
34.	2- 4 pm	Spotters & Specimen of Pathological & Forensic Significance
35.	2- 4 pm	Spotters - Weapons
36.	2- 4 pm	Spotters - Weapons
37.	2- 4 pm	Trace Evidences – Examination of Blood stains, Hair, Seminal stains etc.,
38.	2- 4 pm	Diatom , Artefacts – Microscopic , Video session
39.	2- 4 pm	Death Certificate
40.	2- 4 pm	Toxicology – Introduction , Medico legal Classification
41.	2- 4 pm	Toxicology – Plant Irritants - ricinus, croton, Abrus ergot, semicarpus,calotropis
42.	2- 4 pm	VISCERA PACKING -Preservation of viscera for chemical analysis
43.	2- 4 pm	Toxicology –Animal Irritants - cantharides, Snakes, scorpions, Bees & Wasp
44.	2- 4 pm	Toxicology – Metals & Non Metals
45.	2- 4 pm	Toxicology – Neurotoxics
46.	2- 4 pm	Toxicology – Somniferous poison
47.	2- 4 pm	Toxicology – CNS Depressants
48.	2- 4 pm	Toxicology – CNS Stimulants
49.	2- 4 pm	Toxicology – Cardiac poison - Digitalis, Oleander, quinine, aconite, Hydrocyanic acid
50.	2- 4 pm	Toxicology – Asphyxiants - CO, CO <sub>2</sub> , H <sub>2</sub> S. Drug Dependence
51.	2- 4 pm	Toxicology- Medico legal aspects, classification, Routes of administration, mode of action and Disposal in the body,diagnosis of poisoning in the living and dead, duties of doctor in poisoning cases
52.	2- 4 pm	R E V I S I O N
53.	2- 4 pm	R E V I S I O N
54.	2 – 4 pm	R E V I S I O N
55.	2 – 4 pm	M O C K P R A C T I C A L E X A M
56.	2 – 4 pm	M O D E L P R A C T I C A L E X A M

## **RECOMMENDED BOOKS**

- Narayan Reddy.K.S, The essential of Forensic Medicine and toxicology , 25<sup>th</sup> Edition, Published by Suganadevi ,Hyderabed, 2006
- Apurba Nandy, Principles of Forensic Medicine and Toxicology, 3<sup>rd</sup> Edition, Published by New Central Book Agency, 2010
- Parikh .C.K, Parik's Text book of Medical Jurisprudence and Toxicology,6<sup>th</sup> Edition, CBS Publisher Bangalore, 2008
- Guharaj P.V, Forensic Medicine 2<sup>nd</sup> Edition, Orient Longman
- C.A.Franklin, Modi's Medical Jurisprudence and Toxicology, Published by Tripathi Private Limited, Bombay
- Parikh C.K. Medico Legal Post Mortem in India, Published by Medical Publication.
- Forensic Medicine, Keith Simpson, Bernard Knight, ELBS
- Textbook of Forensic Medicine, V.V.Pillay, 16<sup>th</sup> Edition, Paras Publication, 2011
- Medical Jurisprudence & Toxicology, Lyon's, 11<sup>th</sup> Edition ,Delmer Thomas Learning,2007
- Textbook of Forensic Medicine and Toxicology, R.N.Karmakar, 3<sup>rd</sup> Edition , Academic Publications, 2010

## **JOURNALS FOR REFERENCE**

Journal of Medicine science and Law

American Journal of Forensic Medicine and Pathology published by Lippincott Williams & Wilkins

South Indian Medico Legal Association

International Journal of Legal Medicine

*Knowledge is power  
- Hobbes*

**SRM UNIVERSITY**  
**FACULTY OF MEDICINE**  
**BACHELOR OF MEDICINE AND BACHELOR OF SURGERY**  
**DISTRIBUTION OF MARKS WITH PASSING MINIMUM**

<b>II - PROFESSIONAL YEAR (Para-Clinical Subjects)</b>				
Subject code	Subject title	Evaluation parameter	Passing minimum	Maximum Marks
MBS15201 (paper-I)	Pharmacology	Written (2 Papers)	80	160
		Written including oral	95	190
		Practical	25	50
MBS15202 (paper-II)		Internal Assessment (Theory-30; Practical-30)	21	60
		overall	150	300
MBS15203 (paper-I)	Microbiology	Written (2 Papers)	80	160
		Written including oral	95	190
		Practical	25	50
MBS15204 (paper-II)		Internal Assessment (Theory-30; Practical-30)	21	60
		overall	150	300
MBS15205 (paper-I)	Pathology	Written (2 Papers)	80	160
		Written including oral	95	190
		Practical	25	50
MBS15206 (paper-II)		Internal Assessment (Theory-30;Practical-30)	21	60
		overall	150	300
MBS15207	Forensic Medicine	Written (1 Paper)	40	80
		Written including oral	50	100
		Practical	30	60
		Internal Assessment (Theory-20; Practical-20)	14	40
		overall	100	200



Marks qualifying for pass 50% in Theory  
50% in Theory including Viva-Voce

50% in Practicals

35% in Internal Assessment

50% in Total Aggregate

*Knowledge advances by steps, and not by leaps*  
- Lord Macaulay

**PREFINAL YEAR - MBBS  
COMMUNITY MEDICINE  
CURRICULUM**

**Goals**

Goal of undergraduate teaching / training in Community Medicine is directed towards achievement of "Better Health for All". Aim of undergraduate training is to prepare the students to become Primary Care Physicians competent to handle commonly occurring health problems in the community

**Objectives**

At the end of the course, the learner shall be:

1. Aware of the physical, social, psychological, economic, and environmental health determinants of health and disease
2. Able to think epidemiologically, diagnose totally, treat comprehensively and be able to function as community and first contact physician
3. Able to apply the clinical skills to recognize and manage common health problems including their physical, emotional and social aspects at the individual, family and community levels and deal with public health emergencies
4. Able to identify, prioritize and manage the health problems of the community after making community diagnosis
5. Able to perform as an effective leader of health team at primary care level

**Quantification**

- Must Know (60%)
- May Know (30%)
- Desirable to Know (10%)

## **COMMUNITY MEDICINE PAPER-I**

### **1. MAN & MEDICINE: CONCEPTS OF HEALTH AND DISEASE**

#### **Must Know**

- Introduction to Community Medicine, Medicine in antiquity, Evolution of Community Medicine.
- Definition, dimensions and determinants of health, Holistic concepts of health including concept of spiritual health.
- Characteristics of agent, host & environmental factors in health and disease and the multi factorial aetiology of disease
- Understanding the natural history of disease and application of interventions at various levels of prevention
- Introduction to various health indicators
- Health profile of India

#### **May Know**

- Appreciation of health as a relative concept
- International classification of diseases

### **2. PRINCIPLES OF EPIDEMIOLOGY AND EPIDEMIOLOGICAL METHODS\_**

#### **Must know**

- Epidemiology: definition, concepts, uses and its role in health and disease.
- Use of basic epidemiological tools to make a community diagnosis of the health situation, in orders to formulate appropriate intervention measures.
- Definition of the terms used in describing disease transmission and control.

- Modes of transmission and measures for prevention and control of communicable and non-communicable diseases
- General principles of prevention and control of communicable, non-communicable diseases and other health conditions of public health importance.
- Definition, calculation and interpretation of morbidity and mortality indicators
- Epidemiological study designs.
- Concept of association, causation and biases.
- Investigation of an epidemic of communicable disease and to understand the principals of control measures.
- Need, uses and evaluation of screening tests

#### May know

- Principal sources of epidemiological data.

#### Desirable to know

- Application of computers in epidemiology

### 3. EPIDEMIOLOGY, PREVENTION & CONTROL OF COMMUNICABLE DISEASES

#### Must Know

- For the following infectious diseases listed **Respiratory Infections** ; Small pox, Mumps, Chickenpox, Measles, Acute respiratory infections ,Rubella,Influenza Diphtheria,Whooping cough, Tuberculosis, Meningococcal meningitis, SARS**Intestinal Infections** ; Poliomyelitis, Viral Hepatitis, Cholera, Acute Diarrhoeal diseases, Typhoid fever, Food Poisoning, Amoebiasis, Ascariasis,Hookworm infection, Dracunculiasis. **Zoonoses**; Rabies, Yellow fever, Japanese encephalitis, KFD,Brucellosis,Leptospirosis,Human salmonellosis, Plague, Scrub typhus,Murine typhus, Rickettsial Zoonoses ,Ticktyphus, Taeniasis,Q

fever, Hydatid disease, Leishmaniasis. **Arthropod-borne Infections**, Dengue syndrome, Malaria, Lymphatic filariasis. **Surface Infections**, Trachoma, Tetanus, Leprosy, STD, AIDS. Emerging and Re-emerging infectious diseases. Hospital Acquired Infections. Illnesses that are currently in the news – for example: an epidemic of Ebola....

The student must know the following:

- Burden
- Agent-host-environment interactions with respect to the disease (Epidemiology)
- Diagnostic definitions and methods
- Clinical Management & Application of levels of prevention
- Programme pertaining to that illness

### **May know**

For all infectious diseases listed mentioned above, it would be nice if the student also know the Following:

- Burden: at different levels i.e. Global, National, State and Local statistics
- History of the Disease and any other special significance of the disease

## **4. EPIDEMIOLOGY OF CHRONIC NON COMMUNICABLE DISEASES AND CONDITIONS**

### **Must know**

For all following chronic non-infectious diseases Cardiovascular diseases, Coronary Heart disease,

Hypertension, Stroke, Rheumatic heart disease, Cancer, Obesity

Diabetes, Blindness, Accidents and Injuries the student must know the following:

- Burden
- Risk factors for the illness (Epidemiology) or the web of causation
- Diagnostic definitions and methods
- Clinical Management & Application of levels of prevention
- Programme pertaining to that illness

### **May know**

For all non infectious diseases listed mentioned above , it would be nice if the student also knew the following:

- Burden: at different levels i.e. Global, National, State and Local statistics
- History of the Disease and any other special significance of the disease
- Special studies pertaining to NCDs – for example: Framingham heart study or Doll and Hills study etc

## **5. SOCIAL SCIENCES AND HEALTH**

### **Must Know**

- Medical sociology, Clinico-socio-cultural and demographic evaluation of the individual, family and Community.
- Role of family in health and disease
- Doctor-patient relationship
- Principles of social Anthropology as applicable to Health Sociology
- Influence of social & cultural factors in Health & disease
- Impact of urbanization on health and disease

### **May Know**

- Assessment of barriers to good health and health seeking behaviour.
- Socio-cultural factors related to health and disease in the context of urban and rural societies

### **Desirable to Know**

- Social psychology, Community behaviour and community relationship, Hospital Sociology

## 6. ENVIRONMENT AND HEALTH

### Must Know

- Water: Concepts of safe and wholesome water, sanitary sources of water, water related diseases, water purification processes, water quality standards
- Physical and chemical standards of drinking water quality and tests for assessing bacteriological quality of water
- Health hazards of air, noise, radiation pollution. Concepts of solid waste, human excreta and sewage disposal
- Awareness of standards of housing and the effect of housing on health.
- Role of vectors in the causation of diseases
- Identification, classification and life cycle of vectors
- Individual control measures and principles and application of Integrated vector control methods

### May Know

- Concepts of water conservation and rainwater harvesting
- Mode of action, application cycle of commonly used insecticides and rodenticides.

## 7. NUTRITION & HEALTH

### Must Know

- Common sources of various nutrients and special nutritional requirements according to age, sex & activity
- Nutritional assessment of individual, families and the community by using appropriate methods
- Plan & recommend a suitable diet for the individuals and families as per local availability & economic status
- Common nutrition related health disorders (PEM, VAD, IDD etc) and their control and management.

- Food fortification, additives, adulteration, and food hygiene
- Social and cultural factors in nutrition and health
- Important National Nutritional Programmes.

### **May Know**

- Nutritional surveillance, education and rehabilitation.

### **Desirable to Know**

- National Nutrition policy
- Various laboratory techniques

## **8. GENETICS AND HEALTH**

### **Must Know**

- Chromosomal disorders, multifactorial disorders, preventive and social measures in genetics.

### **May Know**

- Population genetics

### **Desirable to know**

- Advances in molecular genetics

## **9. MENTAL HEALTH**

### **Must Know**

- Classification of mental illness, preventive measures in mental health.
- Alcoholism and drug addiction

## **10. HEALTH INFORMATION BASIC MEDICAL STATISTICS**

### **Must Know**

- Collection, classification, analysis, interpretation and presentation of statistical data,
- Sources of vital statistics like census, SRS, NFHS, NSSO etc.



- Application of statistical methods in various study designs.
- Common sampling techniques
- Simple statistical methods, frequency distribution, measures of central tendency and dispersion.

### **May Know**

- Applying tests of significance in various study designs.

### **Desirable to Know**

- Data entry and data cleaning methods
- Use of statistical tables

## **COMMUNITY MEDICINE: PAPER II**

### **11. DEMOGRAPHY AND FAMILY PLANNING**

#### **Must Know**

- Concepts of Demography, Demographic cycle, Vital statistics.
- Definition, calculation and interpretation of demographic indices like birth rate, death rate, fertility rates, etc
- Population control measures
- Various family planning methods, their advantages and shortcomings
- Medical Termination of Pregnancy and Act (MTP Act)

#### **May Know**

- Population explosion, population dynamics of India
- National Population Policy

#### **Desirable to Know**

- Declining sex ratio and its social implication

## 12. MATERNAL AND CHILD HEALTH

### **Must Know**

- Current status of Reproductive and Child Health.
- Screening of high risk groups and common health problems.
- Reproductive child health (RCH) components, including child survival and safe motherhood, Universal Immunization Programme, Integrated Child
- Development Services Scheme (ICDS), Integrated Management of Neonatal and Childhood Illness(IMNCI) and other existing Programmes
- Organization, implementation and evaluation of reproductive and child health program components.
- Adolescent health
- Handicapped child.
- Organizations, technical and operational aspects of the National Family Welfare Programme.
- Geriatric Medicine.
- School Health.

### **May Know**

- Local customs and practices during pregnancy, childbirth and lactation, child feeding practices.
- Gender issues and Women empowerment.

### **Desirable to know**

- Local customs and practices during pregnancy, child birth and lactation.

### **13. OCCUPATIONAL HEALTH**

#### **Must Know**

- Introduction of Occupational Health, occupational environment
- Specific occupational health hazards, their risk factors and its preventive measures
- Concepts of ergonomics
- Employees state insurance scheme
- Factories Act

#### **May Know**

- Various other legislations related to occupational health

#### **Desirable to Know**

- Diagnostic criteria of various occupational diseases

### **14. HEALTH PROMOTION & HEALTH EDUCATION**

#### **Must Know**

- Understand the concepts of Health promotion and Education, IEC, Behavioural change communication
- Principles & methods of health promotion and education.
- Barriers to effective communication and methods to overcome them.
- Various methods of health education with their advantages and limitations.

#### **May Know**

- Organizing health promotion and education activities at individual, family and community settings

#### **Desirable to Know**

- Evaluation of health promotion and education programme.

### **13. HEALTH CARE SYSTEM IN INDIA**

#### **Must Know**

- Concepts of Primary Health Care and Comprehensive Health Care.
- Health care Delivery System in India and infrastructure at peripheral, primary, secondary and tertiary care level
- Organization of health services in urban area.

#### **May Know**

- Job responsibilities of different category of workers in health system
- Overview of administration at village, block, district, state and central level in India.

#### **Desirable to Know**

- Voluntary Health agencies working in India.

### **13. HEALTH PLANNING, MANAGEMENT AND ADMINISTRATION**

#### **Must Know**

- Concepts of Planning, Planning cycle.
- Components of planning a health activity
- National Rural Health Mission (NRHM)
- Bhore Committee

#### **May Know**

- Management & Public Health Administration
- Classification and understanding of various Qualitative and Quantitative Health Management techniques.
- National Health Policy
- Role of Planning Commission and five year plans in development of health sector in India
- Contributions of various other health committees

### **Desirable to Know**

- Concepts of Health Economics in health planning and management.
- Concepts, scope and methods of Health Audit.

### **14. DISASTER MANAGEMENT**

#### **Must Know**

- Principles of disaster preparedness and application of these in disaster management

### **15. BIO-MEDICAL WASTE AND ITS DISPOSAL**

#### **Must Know**

- Classification/ Category, sources, health hazards and treatment of Bio-Medical Waste.

Application of these principles in different setting of healthcare delivery system

### **16. PUBLIC HEALTH LEGISLATIONS**

#### **Must Know**

- (a) Birth and Death registration act, PFA act, MTP act, CPA, Child labour act, prenatal diagnostic act, Human organ transplantation act.

### **Desirable to Know**

- Other public health legislations.

### **18. NATIONAL HEALTH PROGRAMS**

#### **Must Know**

- RNTCP
- National Vector borne disease control programme.
- Integrated Disease Surveillance Project (IDSP)
- National leprosy control programme.
- National AIDS control programme.

- Reproductive and Child Health.

### **May Know**

- National Iodine deficiency disorder control programme.
- National Cancer Control Programme.
- National Programme for the Control of Blindness
- Health related Millennium Development Goals.

## **20. ESSENTIAL MEDICINES AND COUNTERFEIT MEDICINES**

### **Must Know**

- The concept of essential medicines and the essential drugs list

### **Desirable to Know**

- The problem of counterfeit drugs

## **21. INTERNATIONAL HEALTH**

### **Must Know**

- WHO, UNICEF, FAO, RED CROSS
- International Health Regulation (IHR)

## **SKILLS PART – I**

### **GENERAL SKILLS**

#### **Must Know**

1. Conduction of a clinico-social evaluation of the individual in relation to social, economic and cultural aspects; educational and residential background; attitude to health, disease and to health services; the individual's family and community.
2. Recognise common health problems of the community.
3. Apply elementary principles of epidemiology in carrying out simple epidemiological studies in the community.
4. Carry out health education effectively for the community

#### **May Know**

1. Assist in management of common health problems of the community.
2. Work as a team member in rendering health care

## **PART – II**

### **SKILLS IN RELATION TO SPECIFIC TOPICS**

#### **1. COMMUNICATION**

##### **Must Know**

- The student should be able to communicate effectively with family members at home.
- Patients at clinics or at home.

##### **May Know**

- Carry out health education for individuals, family or a group

##### **Desirable to Know**

- Communicate effectively with peers at scientific forums.

## **2. TEAM ACTIVITY**

### **May Know**

- Work as a member of the health team in planning and carrying out field work like school health.

## **ENVIRONMENTAL SANITATION**

### **Must Know**

- Chlorination of water; estimate the chlorine demand of water.
- Estimate the residual chlorine of water.

### **May Know**

- Collect water samples for microbiological evaluation.

## **COMMUNICABLE AND NON-COMMUNICABLE DISEASES**

### **Must Know**

- Eliciting clinico-social history and examination of the patient diagnosis and treatment. (It is already a part of general skills).
- Fixing, staining and examining smears – peripheral blood smear for malaria and filariasis, sputum for AFB; slit skin smears for leprosy; Hb estimation; urine and stool examination. (This is more relevant under Microbiology & Clinical pathology).
- Assessing the severity and / or classifying dehydration in diarrhoea, upper respiratory tract infection, dog bite, leprosy, tuberculosis.
- Adequate and appropriate treatment and follow-up of leprosy, tuberculosis, malaria, filariasis, rabies, upper respiratory tract infections, diarrhoea and dehydration. 5) Advice on the prevention and prophylaxis of common diseases like tuberculosis, HIV/AIDS vaccine preventable diseases, tetanus, malaria, filariasis, rabies, cholera, typhoid, intestinal parasites.



### **May Know**

- Take necessary steps in / disease outbreak / epidemics / natural disasters – investigation of epidemic, food poisoning; notification; organizing medical care following disasters.

## **MATERNAL AND CHILD HEALTH**

### **Must Know**

- Antenatal – examination of the mother; application of the risk approach in antenatal care.
- Intranatal – conducting a normal delivery; early recognition of danger in intranatal period; referral of cases requiring special care.
- Postnatal – assessment of the mother and new born, advice on appropriate family planning method; promotion of breast feeding; advice on weaning.
- Assessment of growth and development of the child – use of the ‘road to health’ card; recording important anthropometric assessments of the child; giving immunization to the child; identifying high risk infants.

## **STATISTICS**

### **Must Know**

- Application of sampling techniques.
- Apply appropriate tests of significance to make a correct inference.
- Simple analysis and presentation of data.

## **NUTRITION**

### **Must Know**

- Community survey and clinical diagnosis of nutritional deficiencies : - Vitamin A deficiency
- Diagnosis Malnutrition.
- Plan and recommend a suitable diet for the individuals and families bearing in mind local availability of foods, economic status

### **May Know**

- Conducting a diet survey.
- Community survey for Iodine deficiency.

## **OCCUPATIONAL HEALTH**

### **May Know**

Medical examination of workers.

### **Desirable to Know**

- Assessment of a work site.
- Recommendation in improving work sites.

## **HEALTH CARE OF THE COMMUNITY**

### **May Know**

- Ensuring community participation in health care.
- Arranging intersectoral coordination where necessary.
- Working in liaison with other agencies involved in health care in various National Health Programmes.

## **HEALTH MANAGEMENT**

### **Must Know**

- Be an effective team member.

### **May Know**

- Guide and train workers.
- Supervision of workers and programmes.

## **FAMILY PLANNING**

- Advice on appropriate methods

## **MANAGERIAL**

- Organise antenatal and under-five clinic

UNIVERSITY EXAMINATION

**THEORY EXAMINATION**

**Paper I and II, each 3 hours and marks 120**

Paper I

- Man and Medicine: towards health for all
- Concept of health and disease
- Principles of epidemiology and epidemiological methods
- Screening for diseases
- Epidemiology of communicable diseases
- Epidemiology of non- communicable diseases
- Social science and medicine
- Environment and health
- Nutrition and health
- Genetics and health
- Mental health
- Health information and basic medical statistics

Paper II

- Demography and family planning
- Preventive obstetrics, paediatrics and geriatrics
- Occupational health
- Health education and communication
- Health care system in India
- Health planning and management
- Health care of the community
- Disaster management
- Hospital waste management
- Public health legislation
- National health programmes
- Essential medicines and counterfeit medicines
- International health

PRACTICALS EXAMINATION

**(60 marks)**

**Clinico-social case study**

**(One case) (30 marks) (60 min)**

Basic clinical presentation and discussion of diagnosis, treatment and management of common communicable or non-communicable diseases/conditions with emphasis on social and community aspects

**Problem on Epidemiology and Biostatistics (One) (20 marks) (30 min)**

Based on situational analysis from communicable or non-communicable diseases, MCH & FP including demography, Environmental health including Entomology and Occupational Health

**Spotters**

**(Five) (10 marks) (20 min)**

Identification and description of relevant public health aspects of the spotters /specimen by the student. Spotters would be from areas of Nutrition, Environmental health including Entomology & Occupational health, MCH & FP; Microbiology including parasites; vaccines, sera and other immunobiologicals.

**Viva-Voce**

**(20 marks) (30 min)**

Students will be examined by all the examiners about student's comprehension, analytical approach, expression and interpretation of data. Student shall also be given case reports, charts or spotters for interpretation

### DISTRIBUTION OF MARKS

	Section	Time	Marks
1	Theory-Paper I	3 Hours	<b>120 marks</b>
	1) MCQ [20 x 1 mark]	20 minutes	20 marks
	2) Essay [2 x 20 marks]		40 marks
	3) Short Answer [10 x 6 marks]		60 marks
2	Theory – Paper II	3 Hours	<b>120 marks</b>
	1) MCQ [20 x 1 mark]	20 minutes	20 marks
	2) Essay [2 x 20 marks]		40 marks
	3) Short Answer [10 x 6 marks]		60 marks
3	Practical/ Clinical	4 Hours	<b>60 marks</b>
	a) Clinico social case Exam [1 case]		30 marks
	b) Epidemiology & Stat Problem [2 no.]		20 marks
	c) Spotters [5x2]		10 marks
4	Viva voice	2 Hours	<b>20 marks</b>
5	Internal Assessment		<b>80 marks</b>
	a) Theory		40 marks
	b) Practical		40 marks
<b>GRAND TOTAL</b>			<b>400 MARKS</b>

#### Internal Assessment – Marks

Internal Assessment	Total :80 Marks
a) Theory [written test] 5 tests	40 marks
b) Practical	
Clinico Social case / Exercise /Spotter	30 marks
Record book	10 marks

\*Minimum of 35% marks from Internal Assessment Test is required to appear for university Examination

#### Minimum Marks Required for PASS

1	Theory	50 %	[120/ 240]
2	Theory Both paper combined & VIVA	50 %	[130/260]
3	Practical	50 %	[30/ 60]
	<b>Total Pass Marks</b>	50 %	[200/ 400] theory + Practical + Viva + Internal Assessment

**UNIVERSITY EXAMINATION PATTERN**  
**MBBS DEGREE EXAMINATION**  
**PRE FINAL YEAR MBBS**  
**COMMUNITY MEDICINE PAPER I & II**

**Time: 3 Hrs**

**Total Marks: 120**

**PART - A (20 marks)**

**Multiple choices Question (1-20)**

**20x1=20 Marks**

(Must know) 14

(May know) 6

**PART - B (50 marks)**

**I. Essay Question**

**1x20=20 Marks**

1. (Must know)

**II. Write Short notes on:**

**5x6 = 30 Marks**

1. (Must Know)
2. (Must Know)
3. (May Know)
4. (May know)
5. (Desirable to know)

**PART - C (50 marks)**

**I. ESSAY Question**

**1x20=20 Marks**

1. (Must Know)

**II. Write short notes on**

**5x6=30 Marks**

1. (Must Know)
2. (May Know)
3. (May Know)
4. (May Know)
5. (Desirable to know)

**MODEL QUESTION PAPER**  
**M.B.B.S DEGREE EXAMINATION**  
**PRE FINAL YEAR MBBS**  
**MBS15301 – COMMUNITY MEDICINE – PAPER I**

Time: Three hours

Max. Marks: 120

Part A – Twenty minutes

Part A – 20 marks

Part B & Part C – Two hours forty minutes

Part B & Part C – 100 marks

Use **OMR coding sheets** for answering **Part – A**  
Use **separate Answer Books** for **Part – B and Part – C**

**Part – A:** MCQ – 20 questions

(1x 20 = 20 marks)

**PART – B (50Marks)**

**I. Essay Questions** (1 x 20 = 20Marks)

1. Describe the epidemiology, prevention and control of dengue fever in India. **(must know)**

**II. Write Short Notes** (5 x 6 = 30 Marks)

1. Determinants of health **(must know)**
2. Measurements of morbidity **(must know)**
3. Doctor patient relationship **(May know)**
4. National nutrition policy **(desirable know)**
5. International classification of diseases **(may know)**

**PART – C (50Marks)**

**I. Essay Questions** (1 x 20 = 20Marks)

1. Describe common nutrition related health disorders (PEM, VAD, IDD etc) and their prevention and control in India. **(must know)**

**II. Write Short Notes** (5 x 6 = 30 Marks)

1. Oral rehydration therapy **(must know)**
2. Rodenticides **(may know)**
3. Population genetics **(may know)**
4. Standard Normal curve **(may know)**
5. Hospital sociology **(desirable to know)**

**PART – A (20 minutes)**

**Multiple Choice Questions**

**(20 x 1 Marks = 20 Marks)**

Choose the appropriate answer and shade the corresponding box in the OMR sheet

- Epidemiological triad consists of the following except. **(Must know)**  
A Agent  
B Host  
C Disease  
D Environment.
- Which of the following is transmitted through Faeco – oral route? **(Must know)**  
A Leprosy  
B Polio  
C Diphtheria  
D Yellow fever
- Duration of treatment in Pauci – bacillary leprosy is **(Must know)**  
A 6 months  
B 9 months  
C 1 year  
D 2 year
- Herd immunity is not seen in **(Must know)**  
A Pertusis  
B Diphtheria  
C Polio  
D Tetanus
- Intermediate host in malaria is **(Must know)**  
A Anopheles  
B Man  
C Culex  
D None
- Control measures in Modified plan of operation under National malaria Eradication programme is based on **(Must know)**  
A Annual blood examination rate.  
B Annual parasite index.  
C Infant parasite rate.  
D Spleen rate.
- Japanese encephalitis is transmitted by **(Must know)**  
A Anopheles  
B Aedes  
C Culex  
D Mansonia
- Daily requirement of iodine for an adult is **(Must know)**  
A 50 microgram  
B 100 microgram  
C 150 microgram  
D 200 microgram
- The first indicator of protein energy malnutrition **(Must know)**  
A Weight for age  
B Weight for height  
C Height for age  
D Mid arm circumference



10. The amount of residual chlorine after a contact period one hour is **(Must know)**  
A 0.2mg /L B 0.5 mg /L  
C 1 mg /L D 1.5 mg /L
11. Cluster testing is used in ----- **(Must know)**  
A Tuberculosis B Malaria  
C Sexually transmitted disease. D Polio
12. The following articles can be sterilized using autoclave except (**Must know**)  
A Syringes B Sharp instruments  
C Culture media D Gloves
13. For effective protection against radiation the thickness of lead apron should be **(Must know)**  
A 0.01mm B 0.1mm  
C 0.05mm D 0.5mm
14. Single most sensitive tool for evaluating the iron status is measurement of **(Must know)**  
A Haemoglobin concentration B Serum iron concentration  
C Serum transferrin saturation D Serum ferritin concentration
15. All of the following are major mental disorder except **(May know)**  
A Schizophrenia B Maniac depressive psychosis  
C Paranoid D Neurosis
16. Cyclo- propagative as method of biological transmission is seen in **(May know)**  
Dengue fever B Plague  
Malaria D Filaria
17. Vaccine vial monitor is used in **(May know)**  
A Rabies vaccine B DPT vaccine  
C Polio vaccine D BCG vaccine
18. Abate is commonly used in the control of **(May know)**  
A Anopheles stephensi B Anopheles culicifacies  
C Anopheles sudaicus D Anopheles minimus

19. The first antigen to be detected in the serum of Hepatitis B patient is **(May to know)**
- |   |        |   |        |
|---|--------|---|--------|
| A | HBs Ag | B | HBc Ag |
| C | HBe Ag | D | None   |
20. Repeated use of which of the following substance leads to physical dependence **(May to know)**
- |   |              |   |         |
|---|--------------|---|---------|
| A | Cannabis     | B | LSD     |
| C | Barbiturates | D | Cocaine |

**MODEL QUESTION PAPER**  
**M.B.B.S DEGREE EXAMINATION**  
**PRE FINAL YEAR MBBS**  
**MBS15302 – COMMUNITY MEDICINE – PAPER II**

Time: Three hours

Max. Marks: 120

Part A – Twenty minutes

Part A – 20 marks

Part B & Part C – Two hours forty minutes

Part B & Part C – 100 marks

Use **OMR coding sheets** for answering **Part – A**  
Use **separate Answer Books** for **Part – B and Part – C**

**Part – A:** MCQ – 20 questions

(1 x 20 = 20 marks)

**PART – B (50 Marks)**

**I. Essay Questions** (1 x 20 = 20Marks)

1. Define perinatal mortality rate (PMR) and describe the causes and steps to be taken to reduce PMR in India **(must know)**

**II. Write Short Notes** (5 x 6 = 30 Marks)

1. Principles of primary health care **(must know)**
2. Psychosocial problems of elderly **(must know)**
3. Barriers of effective communication **(may know)**
4. Job responsibilities of Multipurpose health worker female **(may know)**
5. Medical audit **(desirable know)**

**PART – C (50 Marks)**

**III. Essay Questions** (1 x 20 = 20Marks)

1. Classify and enumerate the different types of pneumoconiosis and the control measures **(must know)**

**IV. Write Short Notes** (5 x 6 = 30 Marks)

1. Universal immunization programme **(must know)**
2. Health related millennium development goals **(may know)**
3. District blindness control society **(may know)**
4. National health policy **(may know)**
5. Voluntary health agencies in India **(desirable to know)**

**PART – A (20 minutes)**

**Multiple Choice Questions**

**(20 x 1 Marks = 20 Marks)**

Choose the appropriate answer and shade the corresponding box in the OMR sheet

1. The most sensitive indicator of family planning achievement is **(Must know)**  
A Crude birth rate                      B Age specific fertility rate  
C General fertility rate                 D General marital fertility rate
  
  2. The most common cause of maternal mortality in India is **(Must know)**  
A Antenatal haemorrhage            B Eclampsia  
C Postnatal haemorrhage             D Puerperal sepsis
  
  3. Fitting the job to the worker refers to **(Must know)**  
A Economics                            B Emporiatrics  
C Ergonomics                          D Ecology
  
  4. Size of the respirable dust particles that are responsible for Pneumoconiosis is **(Must know)**  
A Less than 5 microns                 B Less than 10 microns  
C Less than 50 microns                D Less than 100 microns
  
  5. Series of speeches on a selected subjects is followed in **(Must know)**  
A Seminar                                B Symposium  
C Conference                             D Panel discussion
  
  6. Control measures in Modified plan of operation under National malaria Eradication programme is based on **(Must know)**  
A Annual blood examination rate.    B Annual parasite index.  
C Infant parasite rate.                 D Spleen rate.
  
  7. Health survey & planning committee is also known as **(Must know)**  
A Bhore committee                    B Mudaliar committee  
C Chadha committee                 D Kartar singh committee
  
  8. Premature infant is one which is born **(Must know)**  
A Before 40 weeks                     B Before 38 weeks  
C Between 28- 37 weeks              D Between 28- 42 weeks
  
  9. DOTS plus strategy is for the treatment of **(Must know)**  
A HIV with TB                          B Malaria with TB  
C MDR TB                                D Leprosy with TB
  
  10. In triage system which of the following colour code is used for ambulatory patients **(Must know)**  
A Red                                      B Black  
C Yellow                                  D Green
-

11. Under biomedical waste management sharp waste should be segregated in **(Must know)**  
 A Blue colour bin or bag                      B Yellow colour bin or bag  
 C Red colour bin or bag                      D Black colour bin or bag
12. The following articles can be sterilized using autoclave except **(Must know)**  
 A Syringes                                      B Sharp instruments  
 C Culture media                              D Gloves
13. Subcentre is staffed by one **(Must know)**  
 A ASHA    B Health worker female  
 C Aganwadi worker                      D Health guide
14. All are true about Propaganda except **(Must know)**  
 A It appeals to emotion                      B Knowledge is spoon fed and passively received  
 C Process is behavior centered              D Stimulates primitive desires
15. Management method based on behavioural sciences include all except **(May know)**  
 A Management by Objectives              B Organization al design  
 C Information systems                      D Network analysis
16. Socratic method of communication is **(May know )**  
 A One way communication                  B Two way communication  
 C Formal communication                  D Informal communication
17. Ideal desk recommended for school child is **(May know)**  
 A Plus desk                                      B Minus desk  
 C Zero desk                                      D Horizontal desk
18. Who is the central figure in child guidance clinic **(May know)**  
 A Paediatrician                              B Psychiatrist  
 C Social worker                              D Public health nurse
19. Head quarters of FAO is **(May know)**  
 A New York                                      B Rome  
 C Geneva    D Madrid
20. World Health Day is celebrated on **( May know)**  
 A January 30<sup>th</sup>                              B April 7<sup>th</sup>  
 C July 1<sup>st</sup>    D October 24<sup>th</sup>

## BOOKS RECOMMENDED

1. Park's Text Book for preventive and Social Medicine, Edited by K. Park, 23<sup>rd</sup> Edition. Banarsidas Bharat 2015

## REFERENCE BOOKS

2. Oxford text book of Public Health (3 volumes), Edited by Walter W. Holland, Roger Detels & George Knox, 5<sup>th</sup> Edition, 2011.
3. Maxcy-Rosenau Public Health and Preventive Medicine Edited by John M.Last, 15<sup>th</sup> Edition 2008.
4. Preventive Medicine for the Doctor in his Community: An epidemiological Approach. Edited by Hugh Rodman Level and E. Gurney Clark, 3<sup>rd</sup> Edition, 1986.
5. Methods in Biostatistics for Medical Students and Research Workers, by Mahajan BK, 7<sup>th</sup> Edition, 2010.
6. Bradford Hill's Principles of medical Statistics, by Bradford Hill, 12<sup>th</sup> Edition, 1991.
7. Short Text book of Priv&Social Medicine, by G.N.Prabhakar, 2<sup>nd</sup> Edition. 2010.
8. Research Methods in Community Medicine Resarch program evaluation Survey Epidemiological, by Abramson, 6<sup>th</sup> Edition, 2008.
9. Mother & Child care, by V.K.Singh, 1<sup>st</sup> Edition, 2003.
10. Modern Nutrition in Health & Disease, by Maurice E . Shils, 10<sup>th</sup> Edition, 2005.
11. Text book for Health Worker, by A.M.Chalkey, 2<sup>nd</sup> Edition, 2004.
12. Community Medicine-Practical manual, by Kameswara Rao, 1<sup>st</sup> Edition, 2004

## JOURNALS FOR REFERENCE

- Indian Journal of Community Medicine
- Indian Journal of Preventive & Social Medicine WHO
- Bulletin
- International Journal Epidemiology American
- Journal of Public health American Journal of
- Epidemiology

*I was bold in pursuit of knowledge, never fearing to follow truth and reason to whatever results they led*

- Thomas Jefferson

# OPHTHALMOLOGY CURRICULAM

## Goals

The aim of teaching undergraduate Students in Ophthalmology is to prepare them to function efficiently and have adequate knowledge of Ophthalmology in accordance with the institutional goals.

## Objectives

### Knowledge

At the end of training in the subject of ophthalmology the student shall be able to :

#### Identify the abnormal conditions of the eye.

- ✓ Diagnose various eye diseases which are most prevalent in the country.
- ✓ Manage various eye conditions like conjunctivitis, stye, Chalazion and foreign body.
- ✓ Recognize and give medical treatment of anterior segment disease.
- ✓ Identify the national objectives and be an active participant in the national programme for prevention and control blindness.
- ✓ Recognize the ophthalmic manifestations of systemic diseases.

### Skills

At the end of the course the students shall be able to:

- a. Determine visual acuity.
- b. Determine field of vision.
- c. Test colour vision.
- d. Take Conjunctival swab.
- e. Use of Ophthalmoscope.
- f. Examine anterior segment of eye.
- g. Remove extraocular foreign body.
- h. Perform Epilation of cilia –CRR I
- i. Incise and drain lid abscess – CRR I
- j. Distant direct Ophthalmoscopy for diagnoses of cataract.
- k. Syringing of the Naso Lacrimal Duct – CRR I
- l. Attend eye camps- CRR I
- m. Intraocular pressure Evaluation

## **HIGHLIGHTS**

The curriculum has been designed as per MCI Advice. Care has been taken to emphasize clinically oriented teaching of Ophthalmology. The obsolete practical exercises have been eliminated and newer teaching methodologies like problem Based learning have been incorporated. An effort has also been made to give more emphasis to the interpretive aspects than technical aspects.

MCI has allocated approximately 100 hours for teaching ophthalmology over a period of two semesters. 10 weeks of 3 hours clinical posting daily spread over 3 semesters which are meant for OP demonstration, Ward Clinics theatre procedure demonstration and Dark room practices. These recommendations have been taken into consideration while assessment in as per MCI recommendation.

## **CURRICULAM:**

The Theory Component would comprise of 100 hrs of didactic teaching which will be vertically integrated as far as possible. It was also decided that the basic medical sciences will be emphasized along with integration of other clinical subjects.

The Clinical posting will comprise 120 hrs of OP, ward and theatre. It was decided to eliminate obsolete clinical practices and include current clinical practices.

The teaching will include seminars, assignments and problem based learning. (PBL)

As part of learning exercise and to promote self study, Problem based learning (PBL) is to be introduced. These will involve small group discussions and will be part of internal assessment. These will be conducted in three sessions of 2 hrs each.



## **SYLLABUS**

At the end of training the students should be able to do have a better understanding & clinical knowledge in the field of Ophthalmology

- a) MUST KNOW 60 %
- b) MAY KNOW 30%
- c) DESIRABLE TO KNOW 10%

### **MUST KNOW**

Knowledge

At the end of training in ht subject of ophthalmology the student shall able to

1. IDENTIFY THE ABNORMAL CONDITIONS OF THE EYE
  - Diagnoses various eye disease which are most prevalent in the country
  - Manage various eye conditions like conjunctivitis , stye, Chalazion and foreign body.
  - Identify the national objectives and be an active participant in the National Programme for prevention and control of blindness.
2. AETIOLOGY , CLINICAL FEATURES AND TREATMENT OF
  - Corneal ulcer – bacterial , Fungal , viral – HSV, adenovirus
  - Keratomalacia
3. BASIC PRINCIPLES OF
  - Eye donation - contraindications, method of enucleation. Eye bank
4. AETIPATHOGENESIS / COMPLICATION OF
  - Ptosis
5. CATARACT
  - Aetiology
  - Clinical features
  - Diagnosis
6. UVEITIS
  - Aetiology
  - Clinical features and
7. GLAUCOMA
  - Aetiology
  - Clinical features and
  - Treatment if various forms of glaucoma

## 8. PROPTOSIS

- Clinical Feature
- Management of orbital disease, common causes of proptosis

## 9. OCULAR MANIFESTATION OF SYSTEMIC DISEASES INCLUDING

- Diabetes
- Hypertension
- Tuberculosis

## 10. VITREOUS DISEASES

Principles of treatment of

- Endophthalmitis

## 11. DIFFERENTIATE SENILE CATARACT AND OPEN ANGLE GLAUCOMA

### **MAY KNOW**

#### 1) KNOWLEDGE

- Recognize and give medical treatment of anterior segment disease.
- Recognize the ophthalmic manifestations of systemic diseases

#### 2) Skills

At the end of the course the students shall be able to

- Determine visual acuity
- Determine field of vision
- Test colour vision
- Use of ophthalmoscope
- Examine anterior segment of eye
- Remove extraocular foreign body
- Incise and drain lid abscess – CRR1
- Distant direct Ophthalmoscopy for diagnoses of cataract
- Syringing of the Naso Lacrimal Duct – CRR1
- Attend eye camps- CRR1

#### 3) AETIOLOGY , CLINICAL FEATURES AND TREATMENT OF

- Conjunctival infections
- Pterygium
- Xerosis

- Trachoma
  - Scleral inflammations
  - Corneal inflammation
- 4) BASICS PRINCIPLES OF
    - Keratoplasty
  - 5) AETIOPATHOGENESIS / COMPLICATIONS OF
    - Ectropion
    - Entropion
    - Symblepharon
    - Lid Inflammations
  - 6) PRESBYOPIA
    - Clinical Features
    - Treatment of various – refractive errors, Presbyopia
  - 7) OPTIC NEURITIS AND PAPPILLOEDEMA
    - Clinical features and management of optic – nerve disorders
    - Differentiation of Papilledema , optic neuritis
  - 8) OCULAR MANIFESTATION OF SYSTEMIC DISEASES INCLUDING
    - Leprosy
    - Pregnancy – induced hypertension
    - Thyroid
  - 9) VITREOUS DISEASES
    - Principles of treatment of
    - Hemorrhage / degeneration
  - 10) INTRA OCULAR TUMORS
    - Retinoblastoma
  - 11) RECENT ADVANCES IN OPHTHALMOLOGY
    - Types and scope of lasers
    - Intraocular lens implantation etc- (a) Phaco, (b) SICS
    - Refractive surgeries – basics.
  - 12) Anatomy and Physiology the particular part of the eye will be discussed wherever classes are taken about the clinical diseases of that particular part.

## **DESIRABLE TO KNOW**

### 1. SKILLS

- Take Conjunctival swab
- Perform Epilation of cilia – CRR1

### 2. BASIC PRINCIPLE OF

- Corneal Blindness

### 3. OCULAR MANIFESTATION OF SYSTEMIC DISEASES INCLUDING

- Anemia
- Aids
- Bleeding disorders

### 4. VITREOUS DISEASES

- Principle of treatment of
- Liquefaction

### 5. INTRA OCULAR TUMERS

- Melanoma

## OPHTHALMOLOGY

### UNIVERSITY EXAMINATION IN THEORY

#### EVALUATION

1. There will be four examinations (two internal and two external) for ophthalmology of third MBBS part I. The internal Head of Department would co ordinate for practical / oral examinations.
2. The oral examination will be conducted by all the four examiners. Each one examining the candidates in one of the topics prescribed. The topics to be examined by each examiner are to be changed among them every day.
3. The marks awarded by the examiners should be exchanged between themselves and the total marks obtained by each candidate, in practical and oral examinations must be finalized immediately after the examination everyday and handed over to the chairman after the examinations are over for the day by the internal Head of Department.
4. In all the Subjects of II MBBS part I the No of candidates examined per day shall not normally exceed 30.

**M.B.B.S. DEGREE EXAMINATION  
PRE FINAL YEAR MBBS  
OPHTHALMOLOGY**

**Time: 3 hrs**

**Max Marks: 80**

**Answer all questions  
Illustrate the answer with suitable diagrams**

**PART - A**

**I. Multiple Choice questions (20x1=20 marks) (1-20)**

Must Know - (15)

May Know - (5)

**PART - B**

**I. Essay Questions (1x10=10 marks)**

1. (Must Know)

**II Write short notes on: (4x5=20 marks)**

1. (Must Know)

2. (May Know)

3. (May Know)

4. (Desirable to know)

**PART - C**

**I. Essay Questions (1x10=10 marks)**

1. (Must Know)

**II Write short notes on: (4x5=20 marks)**

1. (Must Know)

2. (May Know)

3. (May Know)

4. (Desirable to know)

**MODEL QUESTION PAPER**  
**M.B.B.S. DEGREE EXAMINATION**  
**PRE FINAL YEAR MBBS**  
**MBS15303 - OPHTHALMOLOGY**

Time: Three hours

Max. Marks: 80

Part A – Twenty minutes

Part A – 20 marks

Part B & Part C – Two hours forty minutes

Part B & Part C – 60 marks

Use **OMR coding sheets** for answering **Part – A**  
Use **separate Answer Books** for **Part – B and Part – C**

**Part – A: MCQ – 20 questions**

**(20x 01 = 20 marks)**

**PART – B**

**I. Essay question**

**(1 X 10 = 10 Marks)**

1. Define cataract. Explain in detail about the investigations required and the treatment for senile cataract. **(MUST KNOW)**

**II. Write short notes on:**

**(4 X 5 = 20 Marks)**

1. Keratic precipitates **(MUST KNOW)**
2. Dalen fuch's nodule **(MAY KNOW)**
3. Diabetic Retinopathy **(MAY KNOW)**
4. Astigmatism **(DESIRABLE TO KNOW)**

**PART -C**

**I. Essay question**

**(1 X 10 = 10Marks)**

1. Define glaucoma. Enumerate the types of glaucoma. Discuss in detail about the signs, symptoms, investigations and management of acute congestive glaucoma **(MUST KNOW)**

**II. Write short notes on:**

**(4 X 5 = 20 Marks)**

1. Episcleritis **(MUST KNOW)**
2. Phlyctenular conjunctivitis **(MAY KNOW)**
3. Spring catarrh **(MAY KNOW)**
4. Sub Conjunctival Haemorrhage **(DESIRABLE TO KNOW)**

## PART – A

### MCQ's (20 X 1 = 20 Marks)

1. Innermost layer of cornea is **(MUST KNOW)**  
(a) Epithelium (c) Bowman's Membrane  
(b) Endothelium (d) Descemets Membrane
2. Corneal Opacity is **(MAY KNOW)**  
(a) Pingueuella (c) Macula  
(b) All of the above (d) None of the above
3. Tonometry measures **(MUST KNOW)**  
(a) Thickness of cornea (c) Intraocular Pressure  
(b) Tear film thickness (d) Patency of nasolacrimal duct
4. Hypopyon is **(MUST KNOW)**  
(a) Pus in anterior chamber (c) Blood in anterior chamber  
(b) Cells in anterior chamber (d) None of the above
5. Myopia is corrected using **(MUST KNOW)**  
(a) Convex lens (c) cylindrical lens  
(b) Concave lens (d) plans lens
6. Color vision is tested using **(MAY KNOW)**  
(a) Snellen's chart (c) Ichihara's chart  
(b) Pin hole (d) none of the above
7. Aphakia refers to **(MUST KNOW)**  
(a) Absence of lens (c) Presence of lens  
(b) False lens (d) None of the above
8. Pachymetry measures **(MAY KNOW)**  
(a) Pus in anterior chamber (c) thickness of cornea  
(b) Thickness of retina (d) None of the above
9. Hyphaema is **(MUST KNOW)**  
(a) Pus in anterior chamber (c) Blood in anterior chamber  
(b) Cells in anterior chamber (d) None of the above
10. Limbus means **(MAY KNOW)**  
(a) Junction of cornea and sclera  
(b) Anterior chamber and posterior chamber  
(c) Junction of conjunctiva and cornea  
(d) Iris and cornea



11. Keratometer measures **(MUST KNOW)**  
(a) Thickness of cornea (c) Curvature of cornea  
(b) Diameter of cornea (d) Intra ocular pressure
12. Cobble stone appearance of conjunctiva is seen in **(MAY KNOW)**  
(a) Bacterial Conjunctivitis (c) Vernal Conjunctivitis  
(b) Fungal Keratitis (d) Viral Conjunctivitis
13. Astigmatism is corrected using **(MAY KNOW)**  
(a) Convex lens (Plane) (c) Plane concave lens  
(b) Cylindrical lens (d) placido's disc
14. Bitot's spots is seen in **(MUST KNOW)**  
(a) Vitamin E deficiency (c) Vitamin A Deficiency  
(b) Vitamin C deficiency (d) Vitamin D Deficiency
15. Blepharitis is **(MUST KNOW)**  
(a) Inflammation of lid margin (c) inflammation of cornea  
(b) Inward turning of lid margin (d) outward turning of lid margin
16. Rubeosis iridis is **(May Know)**  
(a) New vessels in the disc (c) new vessels in the iris  
(b) Iris atrophy (d) new vessels in the angle
17. Chalazion is **(MAY KNOW)**  
(a) Inflammation of meibomian gland  
(b) Inflammation of zeiss gland  
(c) Inflammation of naso lacrimal duct  
(d) Inflammation of lid
18. Cherry red spot is seen in **(May Know)**  
(a) Central retinal vein occlusion (c) central retinal artery occlusion  
(b) Conjunctivitis (d) Keratitis
19. Chemosis is **(MAY KNOW)**  
(a) Edema of lids (c) edema of cornea  
(b) Edema of conjunctiva (d) inflammation of cornea
20. Ptosis is **(MUST KNOW)**  
(a) Drooping of upper eye lid (c) congestion of conjunctiva  
(b) Edema of conjunctiva (d) edema of cornea

## **BOOKS RECOMMENDED**

- Parson's Diseases of eye , by Ramanjit Sihota, 22<sup>nd</sup> Edition, Elsevier, 2015
- Basics Ophthalmology, by Renu Jogi, 4<sup>th</sup> Edition, Jaypee, 2008
- Textbook of diseases of the eye, by Anand Rao, 3<sup>rd</sup> Edition, All India Publishers, 1999.

## **REFERENCE BOOKS**

- Clinical Ophthalmology, by Jack. J.Kanski, 7<sup>th</sup> Edition, Elsevier, 2011
- Ophthalmology, by Yanoff , Duker, 4<sup>th</sup> Edition, Mosby, 2013

## **JOURNALS FOR REFERENCE**

- Indian Journal of ophthalmology
- British Journal of Ophthalmology.

*“Optimism is the faith that leads to achievement. Nothing can be done without hope and confidence”. “The highest result of education is tolerance”*

*- Helen Keller*

# OTORHINOLARYNGOLOGY (E.N.T) CURRICULUM

## Goals

The aim of teaching undergraduate students in Otorhinolaryngology is to prepare them to have adequate knowledge of Otorhinolaryngology in accordance with the institutional goals.

## Objectives

### Knowledge

At the end of the course, the student will be able to:

- a) Diagnose and manage the common ENT diseases and emergencies.
- b) Adopt the rational use of commonly used drugs, keeping in mind their adverse reactions.
- c) Suggest common investigative procedures and interpret their results.
- d) Advise treatment for the hearing handicapped person and deaf.
- e) Prevent the infective diseases like CSOM and Rhinosporodiosis.

### Skills

At the end of the course the students shall be able to:

1. Be able to use auroscope, nasal speculum, tongue depressor, tuning fork and head mirror otoscope.
2. Conduct CPR (Cardiopulmonary resuscitation) and first aid in newborns, children and adults including endotracheal intubation.
3. Maintain airway (endotracheal intubation / tracheostomy/cricothyroidostomy). Cricothyroidectomy.
4. Perform syringing of ear.
5. Do nasal packing for epistaxis.
6. Perform removal of foreign bodies in ENT.

### HIGHLIGHTS:

The curriculum has been designed as per MCI advice. Care has been taken to emphasize clinically oriented teaching of practice of Otorhinolaryngology. The obsolete practical exercises have been eliminated and newer teaching methodologies like Problem Based Learning have been incorporated. An effort has also been made to give more emphasis to the interpretive aspects than technical aspects.

MCI has allocated approximately 70 hours for teaching Otorhinolaryngology and over 8 weeks of 3 hours clinical posting daily spread over 2 semesters which is meant for OP demonstration, Ward clinics, Theatre procedures demonstration

including Diagnostic Nasal Endoscopy and techniques of audiological evaluation for Hard of Hearing patients and Electro nystagmography for patients with vertigo. These recommendations have been taken into consideration while designing the curriculum. The allocation of marks for summative examination and internal assessment is as per MCI recommendations.

## **CURRICULUM:**

The theory component would comprise of 70 hrs of didactic teaching which will be vertically integrated as far as possible. It was also decided that the basic medical sciences will be emphasized along with integration of other clinical subjects.

The clinical posting will comprise 120 hrs of OP, Ward and Theatre. It was decided to eliminate obsolete clinical practices and include current clinical practices.

The teaching will include seminars, assignments and problem based learning. (PBL)

As part of learning exercise and to promote self-study, problem based learning (PBL) is to be introduced. These will involve small group discussions and will be part of internal assessment. These will be conducted in three sessions of 2 hrs each.

## **SYLLABUS**

At the end of training the students should be able to do have a better understanding & clinical knowledge in the field of O&G.

- a) Must Know (60%)
- b) May Know (30%)
- c) Desirable to Know (10%)

## **EAR**

### **Must Know**

- Surgical anatomy of external, middle and inner ear.
- Physiology of hearing
- Physiology of balance / vestibular function.
- Examination of ear, referred pain
- Tuning fork test, Audiometry – PTA (Pure Tone Audiogram), impedance.
- Hearing assessment & Deaf mutism
- Deafness: Types of causes.
- Diseases of external ear: Pre auricular sinus, cerumen, otitis externa, perichondritis, foreign body, Malignant otitis externa.

- Disease of middle ear – AOM, ASOM, SOM, CSOM – safe & unsafe.
- Antibiotic therapy, bacterial flora.
- Facial nerve, Bells palsy.
- Complications of CSOM.
- Otosclerosis - clinical features and management.
- Meniere` s disease - clinical features and management.
- Surgical management of CSOM.

### **May Know:**

- Surgical management of otosclerosis.
- Audiological evaluation of deaf mute.
- Cochlear implantation. OAE (Oto Acoustic Emission), BERA(Brainstem Evoked Audiometry).
- Congenital malformation of pinna, osteoma, exostosis.
- Vestibular schwannoma, tinnitus.
- Malignancy of ear

### **Desired to know:**

- Brainstem implant
- Surgery for vertigo.
- Vestibular neuritis, auditory neuropathy.
- Keratosis obturans, External Auditory Canal Cholesteatoma.
- Tuberculosis of temporal bone.
- Hearing aids, BAHA (Bone Anchored Hearing Aid), middle ear implant.
- Retrocochlear hearing disorder.
- Petrous apex lesions.

## **NOSE AND PARANASAL SINUSES**

### **Must Know:**

- Surgical anatomy with physiology of nose and paranasal sinuses.
- Symptoms of nasal disease.
- Methods of examination of nose & PNS.
- Disease of nasal septum, deviation of septum and principle of management, septal polyp
- Epistaxis.
- Foreign bodies in nose.
- CSF rhinorrhoea.
- Inflammatory disease of PNS. Acute and chronic sinusitis.
- Inflammation of nose: Furunculosis, vestibulitis.

- Atrophic rhinitis, rhinosporidiosis, rhinoscleroma.
- Nasal septal perforations.
- Endoscopic sinus surgery.

**May Know:**

- Occupational rhinitis.
- Fungal rhinosinusitis.
- Complications of rhinosinusitis.
- Nasal fractures.
- Abnormalities of smell.

**Desirable to know:**

- Conditions of external nose.
- Facial bone fractures.
- Benign and malignant tumors of nose & PNS.

## LARYNX

**Must know**

- Anatomy of larynx
- Functions of larynx.
- Inflammatory lesions of larynx.
- Stridor-causes, investigations and management.
- Vocal cord palsy.
- Lesions of vocal cord.
- Benign and Malignant lesions of larynx.
- Foreign Body larynx
- Tracheostomy

**May Know:**

- Voice and Speech production
- Disorders of voice
- Laryngeal stenosis
- Fracture Larynx
- Tuberculosis Larynx
- Anatomy of tracheobronchial tree.

**Desirable:**

- Speech therapy and phonosurgery
- Obstructive sleep Apnoea

## PHARYNX

### Must know

- Anatomy of pharynx.
- Examination of nasopharynx, oropharynx, laryngopharynx.
- Adenoiditis, Acute & Chronic pharyngitis, Tonsillitis
- Quinsy, retropharyngeal / parapharyngeal abscess.
- Tonsillectomy – indication, contraindication.
- Foreign body throat
- Juvenile Nasopharyngeal Angiofibroma
- Leukoplakia, erythroplakia, submucous fibrosis.

### May Know:

- Obstructive sleep apnea – presentation investigation treatment – surgical.
- Surgical management of malignancy.
- Robotic surgery, LASER, Radio Frequency Ablation, coblation.

### Desirable to Know:

- Malignancy of nasopharynx, oropharynx, hypopharynx.

## **UNIVERSITY EXAMINATION PATTERN**

### **OTORHINOLARYNGOLOGY**

#### **UNIVERSITY EXAMINATIONS IN THEORY AND PRACTICAL**

1. There will be four Examiners (Two Internal and two external) for Otorhinolaryngology of Third MBBS part I. The Internal Head of Department would co-ordinate for practical/oral Examinations.
2. The oral examinations will be conducted by all the four examiners, each one examining the candidates in one of the topics prescribed. The topics to be examined by each examiner are to change among them every day.
3. The marks awarded by the examiners should be exchanged between themselves and the total marks obtained by each candidate, in practical and oral examinations must be finalized immediately after the examination every day and handed over to the Chairman after the examinations are over for the day by the Internal Head of Department.
4. In all the subjects of III MBBS part I the No. of candidates examined per day shall not normally exceed 30.



**M.B.B.S. DEGREE EXAMINATION  
PRE FINAL YEAR MBBS  
ENT (OTORHINOLARYNGOLOGY)**

**Time: 3 hrs**

**Max Marks: 80**

**Answer all questions  
Illustrate the answer with suitable diagrams**

**PART - A**

**I. Multiple Choice questions (20x1=20 marks) (1-20)**

Must Know - (15)

May Know - (5)

**PART - B**

**I. Essay Questions (1x10=10 marks)**

1. (Must Know)

**II Write short notes on: (4x5=20 marks)**

1. (Must Know)

2. (May Know)

3. (May Know)

4. (Desirable to know)

**PART - C**

**I. Essay Questions (1x10=10 marks)**

1. (Must Know)

**II Write short notes on: (4x5=20 marks)**

1. (Must Know)

2. (May Know)

3. (May Know)

4. (Desirable to know)

**MODEL QUESTION PAPER**  
**M.B.B.S DEGREE EXAMINATION**  
**PRE FINAL YEAR MBBS**  
**MBS15304A - OTORHINOLARYNGOLOGY (ENT)**

Time: Three hours Max. Marks: 80  
Part A – Twenty minutes Part A – 20 marks  
Part B & Part C – Two hours forty minutes Part B & Part C – 60 marks

Use **OMR coding sheets** for answering **Part – A**  
Use **separate Answer Books** for **Part – B and Part – C**

**Part – A: MCQ – 20 questions** **(20x 01 = 20 marks)**

**PART – B (30 Marks)**

**I. Essay question: (1x10 = 10 marks)**

1. Discuss the etiology, pathology, clinical features and management of tubo tympanic type of chronic suppurative otitis media (CSOM). **MUST KNOW**

**II. Write Short notes: (4 x5 = 20 marks).**

1. Quinsy **MUST KNOW**
2. TB Larynx **MAY KNOW**
3. Rhino scleroma. **MAY KNOW**
4. Spasmodic Dysphonia **DESIRABLE TO KNOW**

**PART – C (30 Marks)**

**I. Essay question: (1 x 10 = 10 marks)**

1. Classify important conditions causing dysphagia. How do you investigate a case of dysphagia? **MUST KNOW**

**II. Write Short notes: (4 x 5 = 20 marks)**

1. Differential diagnosis of membranous tonsillitis **MUST KNOW**
2. Rhinolalia clausa **MAY KNOW**
3. OAE **MAY KNOW**
4. Le Fort fracture **DESIRABLE TO KNOW**

**Multiple choice questions**

**PART - A**

**Choose the appropriate answer:**

**(20 x 1 = 20)**

1. Ramsay hunt syndrome is herpes virus infection of **MUST KNOW**  
(a) Scarpa's ganglion                      (b) Geniculate ganglion.  
(c) Sphenopalatine ganglion              (d) Stellate ganglion.
  
2. Picket fence type of fever is seen in **MUST KNOW**  
(a) Otitic hydrocephalus                      (b) Lateral sinus thrombosis.  
(c) Temporal lobe brain abscess              (d) Cerebellar abscess
  
3. All are features of Meniere's disease EXCEPT **MUST KNOW**  
(a) Fluctuating hearing loss  
(b) Vertigo is produced in certain head positions.  
(c) Sense of fullness in the ear              (d) Severe tinnitus
  
4. Which of the following is true about cholesteatoma? **MUST KNOW**  
(a) A benign tumor but potentially malignant (b) Contains cholesterol.  
(c) Metastasis of lymphnodes              (d) Erodes surrounding bones.
  
5. Where is the pus collection in quinsy? **MUST KNOW**  
(a) Crypta magna space                      (b) Peritonsillar space.  
(c) Parapharyngeal space                      (d) Retropharyngeal space.
  
6. Type of epithelium lining the vocal cord **MUST KNOW**  
(a) Pseudostratified ciliated columnar      (b) Transitional  
(c) Non keratinizing stratified squamous (d) Glandular
  
7. The artery of epistaxis is **MUST KNOW**  
(a) Anterior ethmoidal artery              (b) Posterior ethmoidal artery  
(c) Sphenopalatine artery                      (d) Superior labial artery
  
8. Precancerous lesions of larynx is **MUST KNOW**  
(a) Laryngeal keratosis                      (b) Contact ulcer  
(c) Laryngitis sicca                              (d) Scleroma
  
9. Esophagus begins at the level of **MUST KNOW**  
(a) C5    (b) C6  
(c) C7    (d) C4

10. All are indications for tonsillectomy **EXCEPT MUST KNOW**
- (a) Acute tonsillitis
  - (b) Styloid excision
  - (c) Recurrent tonsillitis
  - (d) Benign tumour of tonsil
11. Ear ache following tonsillectomy is due to **MUST KNOW**
- (a) Infection
  - (b) IX nerve
  - (c) X nerve
  - (d) Eustachian tube injury
12. Hoarseness is an early symptom in **MUST KNOW**
- (a) Supraglottic growth
  - (b) Glottic growth
  - (c) Subglottic growth
  - (d) All of the above
13. Audiogram of noise induced hearing loss shows: **MAY KNOW**
- (a) "U" shaped curve
  - (b) Sloping down right.
  - (c) Dip in 4 kHz
  - (d) Dip 2 kHz
14. Korner's septum **MAY KNOW**
- (a) Divides outer squamous cells from deeper petrosal cells.
  - (b) Separates VI nerve from petrous apex air cells.
  - (c) Separate perisinus air cells from sigmoid venous sinus.
  - (d) Separated facial nerve from perifacial air cells.
15. Type of voice seen in juvenile nasopharyngeal angiofibroma: **MAY KNOW**
- (a) Rhinolalia clausa
  - (b) Rhinolalia aperta.
  - (c) Hot potato voice
  - (d) Staccato voice
16. Idiopathic degeneration of ganglion cells of Auerbach's plexus results in **MAY KNOW**
- (a) P.V. syndrome
  - (b) Zenker's diverticulum
  - (c) Post cricoids malignancy
  - (d) Achalasia cardia
17. Nasal polyps are associate with all **EXCEPT MAY KNOW**
- (a) Aspirin
  - (b) Cystic fibrosis
  - (c) Asthma
  - (d) Hay fever
18. Repair of tympanic membrane is **MUST KNOW**
- (a) Tympanoplasty
  - (b) Myringoplasty
  - (c) Septoplasty
  - (d) Stepedotomy

19. Recurrent laryngeal nerve supplies all except **MUST KNOW**
- |                              |                           |
|------------------------------|---------------------------|
| (a) Posterior cricoarytenoid | (b) Cricothyroid          |
| (c) Lateral cricoarytenoid   | (d) Transverse arytenoids |
20. Otosclerosis treated medically by **MUST KNOW**
- |              |              |
|--------------|--------------|
| (a) Flouride | (b) Chloride |
| (c) Bromide  | (d) Iodide   |

### **BOOKS RECOMMENDED**

1. A short practice of Otorhinolaryngology by K.K. Ramalingam, 4<sup>th</sup> Edition, Publisher by AITBS, 2014.
2. Textbook of Ear, Nose, Throat by Tuli, 2<sup>nd</sup> Edition, Jaypee 2013.
3. Diseases of ENT by Maqbool, 12<sup>th</sup> Edition, Jaypee 2013.
4. ENT Diseases by Logan Turner. 11<sup>th</sup> Edition, 2015

### **REFERENCE BOOKS**

1. Otorhinolaryngology, by Scott & Brown, 7<sup>th</sup> Edition, Hedder Arnold, 2008.

### **JOURNAL FOR REFERENCE**

- Journal of Otorhinolaryngology (Indian Journal) Laryngoscope (Foreign)

*Think of yourself as on the threshold of unparalleled success.  
A whole clear, glorious life lies before you. Achieve! Achieve!*  
- Andrew Carnegie

**SRM UNIVERSITY**  
**FACULTY OF MEDICINE**  
**BACHELOR OF MEDICINE AND BACHELOR OF SURGERY**  
**DISTRIBUTION OF MARKS WITH PASSING MINIMUM**

<b>III- PROFESSIONAL YEAR – Part 1</b>				
<b>(Clinical Subjects)</b>				
Subject code	Subject title	Evaluation parameter	Passing minimum	Maximum Marks
MBS15301 (paper-I)	Community Medicine	Written (2 Papers)	120	240
		Written including oral	130	260
		Practical	30	60
MBS15302 (paper-II)		Internal Assessment (Theory-40; Practical-40)	28	80
		overall	200	400
MBS15303	Ophthalmology	Written (1 Paper)	40	80
		Written including oral	50	100
		Practical	30	60
		Internal Assessment (Theory-20;Practical-20)	14	40
		overall	100	200
MBS15304	Oto-Rhino- Laryngology	Written (1 Paper)	40	80
		Written including oral	50	100
		Practical	30	60
		Internal Assessment (Theory-20; Practical-20)	14	40
		overall	100	200

Marks qualifying for pass 50% in Theory  
50% in Theory including Viva-Voce  
50% in Practicals  
35% in Internal Assessment  
50% in Total Aggregate

# FINAL M.B.B.S GENERAL MEDICINE CURRICULUM

## Goals

The aim of teaching undergraduate students in General Medicine is to prepare them to have adequate knowledge in the subject, covering both theoretical and practical knowledge, in accordance with the institutional goals.

## Objectives

### Knowledge

At the end of clinical posting, an undergraduate should have the following knowledge / skill. He /she should be able to perform the following: -

Be able to evaluate each patient as a person in society and not merely as a collection of organ systems.

Have developed an interest in cure for all types of patients.

Recognize differences between normal and abnormal behavior.

Be able to discern the hopes and fears of patients which inevitably underlie the symptom complexes and know how to handle these emotions, both in the patient and in others.

Possess sound knowledge of common diseases, their clinical manifestation and natural history.

Elicit a good clinical history and physical findings, elucidate the clinical problems based on these and discuss the differential diagnosis.

Requisition of relevant laboratory tests and perform common side lab procedures.

Be familiar with common imaging techniques, their advantages, disadvantages and indications; be aware of radiation hazards and measures to protect there from.

Outline the principles of management of various diseases, including the medical and surgical procedures available.

Describe the mode of action of commonly used drugs, their doses, side effects, toxicity, indications, contraindication and drug interactions.

Have an open attitude to the newer developments in medicine to keep abreast of new knowledge.

Diagnosis and provide competent initial care to medical emergencies.

Refer medical problems to secondary and tertiary care at appropriate times.

Recognize the problems arising in patients of AIDS.

Have an understanding of the art of medicine involving communication with patients, demonstration of empathy, reassurance, patient education and an understanding of the patient's socio-economic circumstances in relation to management.

Learn to be adaptable to new ideas and new situations where resources may be limited.

Possess knowledge of and perform certain procedures.

Understand the ethical and legal implications of one's medical diseases.

### **Skills**

At the end of the course the students shall be able to:

1. Obtain a proper relevant history and perform a humane and thorough clinical examination including internal examinations (per – rectal and per vaginal) and examinations of all organs / systems in adults.
2. Arrive at a logical working diagnosis after clinical examination.
3. Plan and institute a line of treatment which is need based, cost effective and appropriate for common ailments taking into consideration  
Patient  
Disease  
Socio-economic status
4. Assess and manage fluid / electrolyte and acid – base imbalance.
5. Interpret abnormal biochemical laboratory values of common diseases.
6. Interpret serological tests such as VDRL, ASLO, Widal, HIV, Rheumatoid factor, Hepatitis and TORCH infections.
7. Write a complete case record with all necessary details.
8. Write a proper discharge summary with all relevant information.
9. Write a proper referral note to secondary or tertiary centers or to other physicians with all necessary details.
10. Assess the need for and issue proper medical certificates patients for various purposes.
11. Adopt universal precautions for self protection against HIV and hepatitis and counsel patients.



12. Record and interpret an ECG and be able to identify common abnormalities like myocardial infarction and arrhythmias.
13. Start i.v. line and infusion.
14. Give intradermal / SC / IM / IV injections ,
15. Pass a nasogastric tube
16. Pass a stomach tube and do stomach wash Administer enemas
17. Do Pleural / peritoneal tap Aspirate liver abscess
18. Administer O2 by mask, catheter and O2 tent and be able to handle O2 cylinder.
19. Manage acute anaphylactic shock
20. Manage diarrhoeas / dysenteries; Assess dehydration; prepare and Administer oral dehydration therapy (ORT)
21. Manage emergencies of drowning
22. Manage common poisoning
23. Manage acute pulmonary oedema and left ventricular failure
24. Manage acute severe bronchial asthma.
25. Manage hyperpyrexia

## HIGHLIGHTS

The curriculum has been designed as per MCI recommendations. Graduate Medical Curriculum is oriented towards training students to under take the responsibility of a General Practitioner who is capable of looking after the preventive, promotive, curative and rehabilitative aspects of Medical care.

This has to be further intensified by providing exposure to field practice areas and training during the internship period. Curriculum objectives often refer to areas of scientific knowledge, they are best taught in a setting of clinical relevance with hands on experience for the students to assimilate the knowledge and make it a part of their own working skills.

The graduate Medical Education in clinical subjects should be based primarily on coaching in the ward and in outpatient and emergency departments in small groups, preferably not more than ten students so that a teacher can give personal attention to each student.

Proper records of the work should be maintained, which will form the basis for the students internal assessment. Every attempt must be made to avoid compartmentalization of disciplines and to achieve both horizontal and vertical integration throughout the MBBS course. Students to be encouraged to participate in group discussion and seminar. Group discussion should not have more than 20 students. Faculty members should avail modern educational technology while teaching the students.

MCI has allocated approximately 300 hours (phase) for teaching General Medicine – for theory classes including didactic lectures, demonstration and the seminars in addition to clinical postings. The clinical lectures held from 4<sup>th</sup> semester onwards. The clinical postings to be started from 3<sup>rd</sup> semester onwards. The clinical postings shall be 3 hours daily during the forenoon.

At the beginning of the clinical course i.e. on entry into phase II whole batch shall be given introductory course in clinical methods for 2 wks. Subsequently in each of the 7 semesters (half year) of the 3 ½ years. Clinical course (i.e. semester 3,4& 5 in II MBBS, 6 & 7 in III MBBS part II) the students shall be posted in small batches by rotation. These recommendations have been taken into consideration while designing the curriculum.

### **EXAMINATION PATTERN & BREAK UP OF MARKS**

The assessment will be of two forms. One is the Internal / continuous assessment. A minimum of four written examinations shall be conducted in each subject during an academic year and the average marks of the three best performances shall be taken into consideration for the award of internal assessment marks. Assignments completed by candidates as home work or vacation work may also be considered.

Regular Practical / Clinical examinations shall be conducted in each subject during an academic year and the average marks shall be taken into consideration for the award of internal assessment marks. Marks awarded for maintenance of records should be included in the internal assessment of practical / clinical performance.

A failed candidate in any subject should be provided an opportunity to improve his / her internal assessment marks by conducting a minimum of two examinations each in theory and practical separately and the average be considered for improvement.

The internal assessment marks awarded both in written and clinical separately should be submitted to the University endorsed by the Head of the institution at least fifteen days prior to the commencement of the theory examinations.

A candidate should obtain a Minimum of 35% of marks in internal assessment in a subject to be permitted to appear for the University Examination in that subject. For this purpose the combined marks of theory and clinical Internal Assessment shall be considered.

### **ATTENDANCE REQUIRED FOR ADMISSION TO EXAMINATION**

- A. No candidate shall be permitted to any one of the parts of IIIrd MBBS examination unless he / she has attended the course in the subject for the prescribed period.

- B. A candidate is required to put in a minimum of 75% attendance in both theory & Practical /; Clinical classes separately before admission to the examination & should be certified and forwarded by HOD of the Department at least 15 days prior to the commencement of theory examination.

### **RECORD NOTE BOOK**

Every student must maintain a record of the practical/Clinical work assigned to him/her in the record note Books. These shall be submitted periodically to the respective professors. At the end of the course the practical/clinical case record note books shall be submitted to the heads of the departments who shall evaluate and include the marks in the internal Assessment. Records need not be submitted at the University Practical Examination.

In respect of failed candidates the marks awarded for records at the first attempt may be carried over to the next examinations attempt. If a candidate desires he/she may be permitted to improve on the performance by submissions of fresh record note books.

### **INTEGRATION**

Each of the clinical department shall provide integrated teachings, calling on pre-clinical, para-clinical & other clinical departments to join in exposing the students to the full range of disciplines relevant to each clinical area of study. Problem oriented approach shall be emphasized.

## GENERAL MEDICINE

### Departmental Objectives :-

At the end of the clinical postings in General Medicine, the medical student should :

1. be able to evaluate each patient as a person in society and not merely as a collection of organ systems.
2. have developed an interest in and care for all types of patients.
3. recognise differences between normal and abnormal behaviour.
4. be able to discern the hopes and fears of patients which inevitably underlie the symptom complexes and know how to handle the emotions, both in the patient and in others.
5. possess sound knowledge of common diseases their clinical manifestations and natural history.
6. Elicit a good clinical history and physical findings, elucidate the clinical problems based on these and discuss the differential diagnosis.
7. Requisition relevant laboratory tests and perform common bedside laboratory procedures.
8. Be familiar with common imaging techniques, their advantages, disadvantages and indications; be aware of radiation hazards and measures to protect them from.
9. Be familiar with Universal precaution methods, biomedical waste disposal to have a self protection.
10. outline the principles of management of various diseases, including the medical and surgical procedures available.
11. describe the mode of action of commonly used drugs, their doses, side effects, toxicity, indications, contraindications and drug interaction.
12. Have an open attitude to the newer developments in medicine to keep abreast of new knowledge
13. diagnose and provide competent initial care to medical emergencies.
14. Refer medical problems to secondary and tertiary care at appropriate times.
15. recognize the problems arising in patients of AIDS.
16. Have an understanding of the art of medicine involving communication with patients, demonstration of empathy, reassurance, patient education and an understanding of the patient's socio-economic circumstances in relation to management.
17. learn to be adaptable to new ideas and new situations where resources may be limited.
18. possess knowledge to perform certain procedures.
19. Understand the ethical and legal implications of one's medical decisions.

## **COURSE CONTENTS**

### **I. CLINICAL METHODS IN THE PRACTICE OF MEDICINE**

#### **MUST KNOW :**

1. Clinical approach to the patient : The art of medicine, doctor-patient Relationship, communication skills, doctor's responsibilities and bedside Manners.
2. Clinical approach to disease and care of patient; Diagnostic possibilities based on interpretation of history, physical findings and laboratory investigations and principles of rational management.

### **II. COMMON SYMPTOMS OF DISEASE**

#### **MUST KNOW :**

1. Pain : Pathophysiology, clinical types, assessment and management.
2. Fever : Pathophysiology of heat regulation, its disturbances clinical types, clinical assessment and management.
3. Cough, expectoration and haemoptysis.
4. Dyspnoea, tachypnoea, and cyanosis.
5. Common urinary symptoms including dysuria, oliguria, nocturia, polyuria, incontinence and enuresis.
6. Oedema and anasarca.
7. Shock and cardiovascular collapse.
8. Cardiac murmurs, functional and organic, and Palpitation.
9. Anorexia, nausea and vomiting.
10. Constipation and diarrhoea.
11. Haematemesis, malena and haematochezia.
12. Jaundice and hepatomegaly.
13. Abdominal swelling and ascites.
14. Weight loss and weight gain.
15. Fainting, syncope and seizures, headache, dizziness and vertigo.
16. Paralysis, movement disorders and disorders of gait.
17. Coma and other disturbances of consciousness.
18. Pallor and bleeding.
19. Enlargement of lymph nodes and spleen.
20. Joint pains and pain in the extremities and back.
21. Sleep rhythm, stages and disorders.

### **III. NUTRITION/ EXPOSURE TO PHYSICAL AND CHEMICAL AGENTS**

#### **MUST KNOW :**

- 1) Nutrition in clinical medicine and dietary management :
  - i. Nutritional requirements.
  - ii. Protein calorie malnutrition in adults.
  - iii. Obesity.
  - iv. Vitamin deficiency and excess.
- 2) Fluid and electrolyte balance; acidosis and alkalosis in particular relevance to vomiting, diarrhoea, uraemia and diabetic ketoacidosis.
- 3) Poisonings: Phenobarbitone, organophosphorous compounds, sedative / hypnotic and others common in the locality.
- 4) Acute and chronic effects of alcohol and their management and deaddiction
- 5) Venoms, stings, insect bites: Poisonous snakes, insects and scorpions.
- 6) Disturbances of temperature: Heat stroke, heat exhaustion and cold exposure.
- 7) Drowning, electrocution and radiation hazards.

### **IV. INFECTIONS**

#### **MUST KNOW :**

- 1) Approach to infectious diseases – diagnostic and therapeutic principles.
- 2) General principles of rational use of antibiotics and other chemotherapy against the following:
  1. Common gram positive infections.
  2. Common gram negative infections and anaerobic infections.
  3. Enteric fever.
  4. Cholera, gastroenteritis, food poisoning and dysentery.
  5. Influenza and other common viral respiratory infections.
  6. Rabies.
  7. Tetanus.
  8. Herpes simplex and herpes zoster.
  9. Amoebiasis and worm infestations.
  10. Malaria, filariasis.
  11. Common exanthemata.
  12. HIV infection and infections in the immunocompromised conditions.
  13. Common sexually transmitted diseases.
  14. Common fungal infections.

15. Viral encephalitis.
16. Tuberculosis.
17. Leprosy.
18. Brucellosis.
19. Leptospirosis.
20. Hepatitis A,B,C,D

### **MAY KNOW :**

- 1) Leishmaniasis.
- 2) Infectious mononucleosis.

## **V. HAEMATOLOGY**

### **MUST KNOW :**

- 1) Definition,prevalence,aetiologicalfactor,pathophysiology,pathology,recognition, investigations andprinciples of treatment of :
  - i) Anaemias:Irondeficiency,megaloblastic and common haemolytic anaemias (thalassemia,sicklecell and acquired haemolytic).
  - ii) Common bleeding disorders (thrombocytopenia andhaemophilia).
  - iii) Agranulocytosis and aplastic anaemia.
- 2) Leukaemias.
- 3) Lymphomas.
- 4) Bloodgroupandtransfusion:Majorbloodgroupsystemsandhistocompatibilitycomplex,conceptsoftransfusionandcomponenttherapy;indicationsfortransfusiontherapy,precautionstobetakenduringBloodtransfusion,hazardsoftransfusionandsafe handlingofblood and blood products, transfusion reaction and management.

## **VI. RESPIRATORY SYSTEM**

### **MUST KNOW :**

- 1) Physiology and diagnostic methods:Sputum examination, X- ray chest, pulmonary function tests and bronchoscopy.
- 2) Upper respiratory infections.
- 3) Pneumonias.
- 4) Bronchiectasis and lung abscess.
- 5) Bronchial asthma and tropical eosinophilia.
- 6) Chronic obstructive airway disease and cor pulmonale.
- 7) Acute and chronic respiratory failure.
- 8) Diseases of pleura : pleural effusion, empyema, pneumothora
- 9) Pulmonary tuberculosis.
- 10) Neoplasms of lung.
- 11) Common occupational lung diseases.
- 12) Pulmonary embolism.

**MAY KNOW:**

- 1) Fungal diseases

**VII. CARDIOVASCULAR SYSTEM**

**MUST KNOW :**

- i. Physiology & Clinical symptomatology, E.C.G., X-ray chest and
1. ECHO with reference to common cardiovascular diseases.
- ii. Coronary artery disease.
- iii. Rheumatic fever and rheumatic heart disease.
- iv. Infective endocarditis.
- v. Hypertension and hypertensive heart disease.
- vi. Acute and chronic heart failure.
- vii. Common congenital heart diseases in adolescents and adults : ASD, VSD, PDA, TOF and Coarctation of Aorta.
- viii. Common cardiac arrhythmias and managements.
- ix. Acute and chronic pericarditis, pericardial effusion and cardiac tamponade.

**MAY KNOW :**

- 1) Common aortic diseases; peripheral vascular disease; arterial and venous.
- 2) Cardiomyopathy
- 3) Atherosclerosis

**DESIRABLE TO KNOW:**

- 1) Cardiac devices like pacemaker, intraaortic balloon, cardiac catheterisation

**VIII. GASTROINTESTINAL TRACT**

**MUST KNOW :**

- 1) Stool examination.
- 2) Acid peptic disease.
- 3) Malabsorption syndrome.
- 4) Acute and chronic hepatitis.
- 5) Cirrhosis of liver.
- 6) Abdominal tuberculosis.
- 7) Pancreatitis.
- 8) esophageal motility disorders

**MAY KNOW :**

- 1) Inflammatory bowel disease and irritable bowel syndrome.
- 2) Endoscopy and radiology in reference to common gastrointestinal diseases.
- 3) Non cirrhotic portal fibrosis

**DESIRABLE TO KNOW:**

- 1) Storage disorders



## **IX. EMERGENCY MEDICINE**

### **MUST KNOW :**

- 2) Cardiopulmonary resuscitation.
- 3) Acute pulmonary oedema.
- 4) Hypertensive emergencies.
- 5) Diabetic ketoacidosis and hypoglycaemia.
- 6) Status epilepticus.
- 7) Acute severe bronchial asthma.
- 8) Shock.
- 9) Acute myocardial infarction.
- 10) Upper GI bleed and hepatic coma.
- 11) Diagnosis and management of comatose patient.
- 12) Management of poisoning and envenomation
- 13) BLS and ACLS
- 14) Sepsis management
- 15) Anaphylactic reactions and management
- 16) Tracheostomy

### **MAY KNOW :**

- 1) Arrhythmia management and pacing
- 2) Disseminated intravascular coagulation
- 3) Brainstem death

### **DESIRABLE TO KNOW:**

- 1) Outcome of intensive care scoring systems

## **X.NERVOUS SYSTEM**

### **MUST KNOW :**

- 1) Cerebrovascular diseases.
- 2) Meningitis : Viral, bacterial and tuberculosis.
- 3) Peripheral neuropathy.
- 4) Epilepsy.
- 5) Extrapyramidal diseases.
- 6) Common compressive and noncompressive spinal cord syndromes.
- 7) Motor system disease.
- 8) Myasthenia gravis.
- 9) Common myopathies in India.
- 10) Degenerative, nutritional and metabolic diseases of the nervous system.
- 11) Coma
- 12) Headache

- 13) Symptoms and signs of Increased intracranial tension including fundus examination and management
- 14) Demyelinating diseases

**MAY KNOW :**

- 1) Neuroimaging
- 2) Sleep disorders
- 3) Transverse Myelitis

**DESIRABLE TO KNOW:**

- 1) Paraneoplastic neurological disease
- 2) Hydrocephalous
- 3) Bladder, bowel and sexual disturbance

**XI. URINARY SYSTEM**

**MUST KNOW :**

- 1) Acute kidney injury
- 2) Chronic renal failure.
- 3) Glomerulonephritis and nephrotic syndrome.
- 4) Urinary tract infections / pyelonephritis.
- 5) Tubulointerstitial diseases and toxic nephropathies.

**MAY KNOW :**

- 1) Renal replacement therapy
- 2) Peritoneal dialysis
- 3) Hemodialysis

**DESIRABLE TO KNOW:**

- 1) Drugs and kidney
- 2) Pregnancy and renal diseases

**XII. CONNECTIVE TISSUE DISORDERS**

**RHEUMATOLOGY AND BONE DISEASE**

**MUST KNOW :**

- 1) Rheumatoid arthritis.
- 2) Degenerative joint disease including cervical spondylosis.
- 3) Systemic lupus erythematosus, systemic sclerosis and other collagenvascular diseases.

**MAY KNOW :**

- 1) Gout.
- 2) Ankylosing spondylitis
- 3) Psoriatic arthritis
- 4) Reactive arthritis

### **DESIRABLE TO KNOW**

- 1) Polymyositis
- 2) Dermatomyositis
- 3) Poly arteritis nodosa
- 4) Carpal tunnel syndrome

### **XIII. ENDOCRINES**

#### **MUST KNOW :**

- 1) Diabetes mellitus.
- 2) Hypo and hyperthyroidism; iodine deficiency disorders.
- 3) Cushing's syndrome and Addison's disease; Hyperalosteronism.
- 4) Pituitary disorders : Gigantism, Acromegaly and Sheehan's syndrome.
- 5) Calcium and phosphorus metabolism: Parathyroid and metabolic bone disease.

#### **MAY KNOW :**

- 1) Approach to infertility
- 2) Diabetic insipidus
- 3) Amenorrhoea
- 4) male hypogonadism
- 5) infertility
- 6) Gynaecomastia
- 7) Polycystic ovarian syndrome

#### **DESIRABLE TO KNOW:**

- 1) Turner's syndrome
- 2) Klinefelter's syndrome

### **XIV. GERIATRICS**

#### **MAY KNOW :**

- 1) Presentation of diseases in the elderly; Identification of common Diseases – falls, dizziness, delirium, urinary incontinence
- 2) Diet for the aged; Management of Nutritional disorders.
- 3) Acute medical problems: infections, dehydration, acute confusional states.
- 4) Osteoporosis; Degenerative joint diseases; effects of immobility – prevention of contracture and bedsores.
- 5) Neurological disturbances – management & rehabilitation.

**DESIRABLE TO KNOW:** Comprehensive geriatric assessment

### **XV. DERMATOLOGY**

#### **MUST KNOW :**

- 1) Diseases caused by nutritional and environmental factors.
- 2) Infective disorders: Pyodermas, Common Viral and Fungal infections.
- 3) Infestations: Scabies, Pediculosis.

- 4) Allergic disorders: Urticaria, Atopic dermatitis, and contact dermatitis.
- 5) Common drug reactions and eruptions: Erythema multiforme, Toxic epidermal necrolysis and Exfoliative dermatitis.
- 6) Dermatitis and Eczema.
- 7) Alopecia and Hirsutism.
- 8) Sebaceous glands: Structure and Function; Acne, Seborrhoeic dermatitis, Other diseases; Pityriasis capitis.
- 9) Sweat glands: Structure, Function and Diseases; Miliaria, Hyperhidrosis.
- 10) Leprosy: Classification, Pathology, Clinical features, Diagnosis, Reactions, Management, Deformities and Control Programme.
- 11) Psoriasis.
- 12) Lichen Planus.
- 13) Sexually Transmitted Diseases : Genital ulcerative diseases, Genital discharge diseases.
- 14) Dermatological therapy.

**MAY KNOW :**

Vesiculobullous Diseases: Pemphigus, Pemphigoid and Dermatitis herpetiformis.

**DESIRABLE TO KNOW :**

Melanocyte, Pigment metabolism and disorders of pigmentation; Ichthyosis.

**XVI. PSYCHIATRY**

**MUST KNOW :**

- 1) Classification of the different types of psychoses; differences between psychoses and neuroses; difference between functional and organic psychoses.
- 2) Clinical features, diagnosis and management of: Schizophrenia; Bipolar mood disorder and depression; Anxiety disorders and hysteria; Dementia; Alcoholism ; Substance abuse.
- 3) Clinical recognition and initial therapy of psychiatric emergencies.
- 4) Principles of psychiatric counseling and deaddiction

**MAY KNOW :**

- 1) Eliciting a detailed psychiatric history and conducting a mental status
- 2) examination; defining, eliciting and interpreting psychopathological symptoms and signs.
- 3) Concepts underlying normal and abnormal human behaviour; principles of learning, memory, personality and intelligence; psychopathology (behavioural sciences).
- 4) Psychogeriatrics.

**DESIRABLE TO KNOW :**

- 1) Historical aspects of the diagnosis and treatment of mental illness; concept of mental health Vs mental illness; classificatory system currently in use in psychiatry.

- 2) Clinical features, diagnosis and management of psychiatric disorders of childhood and adolescence.
- 3) Personality disorders.

## **XVII. RADIODIAGNOSIS**

### **MUST KNOW :**

1. Respiratory system: Diagnosis of common conditions like tuberculosis, consolidation, pleural effusion, pneumothorax, lung abscess, collapse, bronchogenic carcinoma and mediastinal masses; Differential diagnosis of mediastinal masses; indications for bronchography, tomography and CT scans.
2. Cardiovascular system : Normal topography of heart, cardiomegaly; Common rheumatic heart diseases and pericardial effusion.
3. Gastrointestinal system : Diagnosis of acute abdominal conditions like intestinal obstruction and perforation; Indications and contraindications for Barium studies; Differential diagnosis of calcification and stones on plain X- ray; Diagnosis of gastric ulcer/ cancer stomach/oesophageal cancer on Barium studies.
4. Skeletal System: Diagnosis of common fractures, caries spine, osteomyelitis, nutritional deficiencies like rickets, common bone tumours and diseases of joints, flurosis
5. Excretory System : Identification of renal calculi; Contrast studies.

### **SKILLS**

1. Obtain a proper relevant history and perform a humane and thorough clinical examination including internal examinations (per-rectal and per vaginal) and examination of all organs / systems in adults.
2. Arrive at a logical working diagnosis after clinical examination.
3. Order appropriate investigations keeping in mind their need, relevance and cost effectiveness.
4. Plan and institute a line of treatment which is need based, cost effective and appropriate for common ailments taking into consideration :-
  - a. Patient,
  - b. disease evidence
  - c. Socio-economic status,
  - d. Institutional / Governmental guidelines.
5. Recognizes situations which call for urgent or early treatment at secondary and tertiary centers and make a prompt referral of such patients after giving first aid or emergency treatment.
6. Assess and manage fluid / electrolyte and acid-base imbalance.
7. Interpret abnormal biochemical laboratory values of common diseases.
8. Interpret skiagrams of common diseases.
9. Identify irrational prescriptions and explain their irrationality.

10. Interpret serological testssuchasVDRL,ASLO,Widal,HIV,Rheumatoidfactor, Hepatitis andTORCH infections.
11. Demonstrate empathy and humane approach towards patients, relatives and attendants.
12. Demonstrate interpersonal and communications skills befitting a physician in order to discuss the illness and its outcome with patient and family.
13. Write a complete case record with all necessary details.
14. Write a proper discharge summary with all relevant information.
15. Write a proper referral note to secondary or tertiary centres or to other physicians with all necessary details with provisional diagnosis.
16. Assess the need for and issue proper medical certificate to patients for various purposes.
17. Adopt universal precautions for self protection against HIV and hepatitis and counsel patients.
18. Perform skin sensitivity tests for drugs and serum. Record and interpret an ECG and be able to identify common abnormalities like myocardial infarction and arrhythmias.
19. Start i.v. line and infusion.
20. Do venous cutdown.
21. Give intradermal / SC / IM / IV injections.
22. Insert and manage a C.V.P. line.
23. Conduct CPR (Cardiopulmonary resuscitation) and first aid in newborns, children and adults including endotracheal intubation, ACLS.
24. Pass a nasogastric tube.
25. Pass a stomach tube and do stomach wash.
26. Administer enemas.
27. Do lumbar puncture.
28. Do pleural / peritoneal tap.
29. Aspirate liver abscess
30. Catheterise bladder in both males and females.
31. Relieve tension pneumothorax by inserting a needle.
32. Administer O<sub>2</sub> by mask, catheter and O<sub>2</sub> tent and be able to handle O<sub>2</sub> Cylinder, suction and ventilatory support
33. Insert flatus tube.
34. Provide first aid to patients with peripheral vascular failure and shock.
35. Manage acute anaphylactic shock.
36. Manage diarrhoeas / dysenteries; Assess dehydration; prepare and administer oral rehydration therapy (ORT).
37. Manage emergencies of drowning.
38. Manage common poisoning.
39. Manage acute pulmonary oedema and left ventricular failure.
40. Manage acute severe bronchial asthma.
41. Do emergency management of epilepsy and status epilepticus
42. Do emergency management of comatose patients regarding airway, positioning, prevention of aspiration and injuries.
43. Manage hyperpyrexia.
44. Perform skin scrapings and do a KOH preparation for fungus infections.

45. Prepare slit skin and nasal smear for lepra bacilli.
46. Do staining for STD Cases.
47. Do psychiatric evaluation and recognize common psychiatric illnesses.
48. Use of questionnaires in psychology.
49. Use of intelligence tests.
50. More emphasis on HIV.
51. Emphasis on Tropical Medicine.
52. Emphasis on National Programme like Malaria, RNTCP, DOTs, & ART etc.,
53. Bone marrow aspiration

## EVALUATION

**INTERNAL ASSESSMENT:** 120 marks

Theory	–	60 marks
Clinical	–	50 marks
Record	–	10 marks

Total Internal assessment 120 marks  
-----

Should get 35% (42/120) to qualify for the University exam.

### **PATTERN OF EXAMINATIONS:**

#### **THEORY:**

Two papers of three hours duration 120 marks each.

#### **Paper I – General Medicine**

1. Aging
2. Critical care
3. Poisoning
4. Oncology palliative care and pain
5. Clinical Biochemistry and Metabolism
6. Kidney and Urinary Track
7. Cardio Vascular Disease
8. Endocrine Disease
9. Diabetics
10. Alimentary track and Pancreatic Diseases
11. Liver and Biliary track Diseases
12. Blood Diseases
13. Rheumatology and Bone Diseases

#### **Paper II – General Medicine (Including Psychiatry, Dermatology S.T.D., Tuberculosis & Chest Diseases)**

1. Neurology and Stroke
2. Medical Psychiatry
3. Skin
4. Sexually Transmitted infection
5. HIV and AIDS
6. Respiratory Diseases
7. Principles of Infectious Disease
8. Infectious Diseases



- 9. Environmental and Nutritional Factor and Disease
- 10. Genetics
- 11. Immunology

**PATTERN FOR PAPER – I**

Long Essays	- 02x20	=40marks
Short Essays	- 10x06	=60marks
MCQ's	- 20x01	=20marks
		-----
Total		=120marks
		-----

**PATTERN FOR PAPER – II**

Long Essays	- 02x20	=40marks
Short Essays	- 10x06	=60marks
MCQ's	- 20x01	=20marks
		-----
Total		=120marks
		-----

Paper I & Paper II		=240marks
Theory Internal Assessment		= 60marks
		-----
Total		=300marks

Should get 50% (150/300) in theory Exam  
 Four Examiners for clinical exam (Minimum 50% must be external)  
 - 2 Internal examiner and 2 External examiner

Clinical Examinations 300marks		
Long case – 1	=	100marks
Short case -1	=	40marks
Spotter – 3x20	=	60marks
		-----
Total		200marks
Viva	=	40marks
Clinical Internal Assessment	=	50marks
Record	=	10marks
		-----
		300marks

Marks Qualifying for a pass  
 50% in theory written (mandatory) - 150/300  
 50% in University Clinical (mandatory) - 150/300

35% in Internal Assessment  
Theory & Clinical & Record = 42/120  
Total 50% aggregate = 300/600

**UNIVERSITY EXAMINATION PATTERN**  
**MBBS DEGREE EXAMINATION**  
**FINAL YEAR MBBS**  
**GENERAL MEDICINE PAPER I & II**

**Time: 3 Hrs**

**Total Marks: 120**

**PART - A (20 marks)**

**Multiple choices Question (1-20)**

**20x1=20 Marks**

Must know 14  
May know 6

**PART - B (50 marks)**

**I. Essay Question**

**1x20=20 Marks**

1. (Must know)

**II. Write Short notes**

**5x6 = 30 Marks**

1. (Must Know)
2. (Must Know)
3. (May Know)
4. (May know)
5. (Desirable to know)

**PART - C (50 marks)**

**III. ESSAY Question**

**1x20=20 Marks**

1. (Must Know)

**IV. Write short notes**

**5x6=30 Marks**

1. (Must Know)
2. (May Know)
3. (May Know)
4. (May Know)
5. (Desirable to know)

**Model Question Paper**  
**MBBS Degree examination**  
**Final year MBBS**  
**Paper I – MBS15401 General Medicine**

**Time: Three hours**  
**Two hours and Forty minutes**  
**For Part-B & Part-C**

**Max.Marks:120**  
**Part-A: 20marks**  
**Part-B & Part-C: 100marks**

**Use OMR coding sheet for answering Part – A**  
**Use separate Answer Books for Part-B & Part –C**

**PART - B (50 marks)**

**I. Essay Question:** **1X20=20 marks**

1. Discuss the etiology clinical features, investigation and management of infective endocarditis. **(Must know)**

**II. Write short notes on:** **5X6= 30 marks**

1. Ulcerative colitis **(May know)**
2. Leptospirosis **(Desirable to know)**
3. Cardiac enzymes **(Must know)**
4. Migraine **(May know)**
5. Hemophilia **(Must know)**

**PART - C (50 marks)**

**III. ESSAY QUESTION** **1X20= 20 marks**

1. Discuss in detail the causes, clinical features and management of pneumonia. **(Must know)**

**IV. Write short notes on:** **5X6= 30 marks**

1. Tumor lysis syndrome **(Desirable to know)**
2. Acute renal failure **(Must know)**
3. Heat stroke **(May know)**
4. Copper sulphate poisoning **(May know)**
5. Vitamins B 1 deficiency **(May know)**

## PART - A

### Multiple choice questions

20 X 1 = 20 Marks

1. Pulsus paradoxus occurs in all of the following except **(Must know)**  
a. cardiac tamponade                      c. Superior vena obstruction  
b. severe airway obstruction              d. Hypertrophic cardiomyopathy
2. All are signs of severe aortic regurgitation except **(Must know)**  
a. low volume pulse                      c. capillary pulsation in nail beds  
b. fourth heart sound                      d. pistol shot femoral pulsation
3. All are contraindications of thrombolysis except **(Must know)**  
a. Active internal bleeding              c. Traumatic resuscitation  
b. Previous intracranial hemorrhage    d. controlled hypertension
4. Stages of Chronic kidney disease is defined by **(Must know)**  
a. GFR    c. Urine output  
b. Blood Urea level                      d. Blood pressure
5. Nephrotic syndrome is characterised by all except **(May know)**  
a. Proteinuria > 3.5g/day                  c. hypercholesterolemia  
b. hematuria                                  d. hypoalbuminemia
6. All are renal causes of Acute kidney injury except **(Must know)**  
a. Glomerulonephritis                      c. Urinary calculi  
b. Acute tubular necrosis                  d. Interstitial nephritis
7. All are causes of Macrocytosis except **(May know)**  
a. Vitamin B 12 deficiency                  c. Hypothyroidism  
b. Liver Disease                              d. Thalassemia
8. All are causes of pancytopenia except **(Must know)**  
a. Aplastic anaemia                          c. Iron deficiency anaemia  
b. Lymphoma                                  d. Megaloblastic anaemia
9. All are features suggestive of hemolysis except **(Must know)**  
a. Increased reticulocytes                  c. Decreased Haptoglobin  
b. Decreased LDH                              d. Increased indirect Bilirubin
10. Which among the following inhibit satiety? **(May know)**  
a. Glucagon like peptide 1                  c. Leptin  
b. Peptide YY                                  d. Ghrelin

11. All of the following are neurological consequences of vitamin b12 deficiency except **(Must know)**
- |                             |                  |
|-----------------------------|------------------|
| a. Peripheral neuropathy    | c. stroke        |
| b. Spinal cord degeneration | d. optic atrophy |
12. All are features of Niacin Deficiency except **(May know)**
- |               |              |
|---------------|--------------|
| a. Dermatitis | c. Diarrhoea |
| b. Dyspepsia  | d. Dementia  |
13. The Daily requirement of potassium is **(Must know)**
- |                    |                    |
|--------------------|--------------------|
| a. 1.0-1.5 mmol/kg | c. 3.0-4.0 mmol/kg |
| b. 2.0-3.0 mmol/kg | d. 2.5-3.5 mmol/kg |
14. All are causes of Hypervolemic hyponatremia except **(May know)**
- |                               |                       |
|-------------------------------|-----------------------|
| a. Congestive cardiac failure | c. Nephrotic syndrome |
| b. Cirrhosis                  | d. Diuretic therapy   |
15. Which among the following is an example of High anion gap Metabolic acidosis? **(Must know)**
- |                           |                        |
|---------------------------|------------------------|
| a. Diarrhoea              | c. Lactic acidosis     |
| b. Renal tubular acidosis | d. Small bowel fistula |
16. Which among following causes Vesicular rashes? **(Must know)**
- |                |               |
|----------------|---------------|
| a. Dengue      | c. Leptospira |
| b. Chicken pox | d. Measles    |
17. All are true about leptospirosis except **(Must know)**
- |   |                   |
|---|-------------------|
| a. Most frequent host is dog                        | c. ARDS can occur |
| b. Aseptic meningitis can occur                     |                   |
| d. microscopic agglutination test is test of choice |                   |
18. Which among the following are not used in chemoprophylaxis of malaria? **(Must know)**
- |                |                |
|----------------|----------------|
| a. Mefloquine  | c. Doxycycline |
| b. Chloroquine | d. Artesunate  |
19. Weber syndrome is characterised by all except **(May know)**
- |                                  |  |
|----------------------------------|--|
| a. Ipsilateral third nerve palsy | c. Contralateral UMN 7 <sup>th</sup> palsy |
| b. Horner syndrome               | d. Contralateral hemiplegia                |
20. All are characteristics of parkinsonian tremors except **(Must know)**
- |                           |                           |
|---------------------------|---------------------------|
| a. Unilateral             | c. low frequency (3-4 hz) |
| b. Occurs during activity | d. pill rolling type      |

**Model Question Paper**  
**M.B.B.S Degree Examination**  
**Final Year MBBS**  
**Paper II - MBS15402 General Medicine**  
**(Including Psychiatry, Dermatology STD, Tuberculosis and Chest Disease )**

**Time: Three hours**  
**Two hours and Forty minutes**  
**For Part-B & Part-C**

**Max.Marks:120**  
**Part-A: 20marks**  
**Part-B & Part-C: 100marks**

**Use OMR coding sheet for answering Part – A**  
**Use separate Answer Books for Part-B & Part –C**

**PART - B (50 Marks)**

**I. Essay Question:** **1X20= 20 marks**

1. Etiology, clinical features, diagnosis, complications and management of portal hypertension. **(Must know)**

**II. Write short notes on:** **5X6=30 marks**

1. Management of scorpion sting **(Must know)**
2. Atrial fibrillation **(Must know)**
3. Pediculosis **(Desirable to know)**
4. Tetany **(May know)**
5. Gout **(May know)**

**PART - C (50 marks)**

**III. Essay Question** **1X20= 20 marks**

1. What are the causes of thrombocytopenia? Discuss the clinical features and management of dengue fever. **(Must know)**

**IV. Write short notes on:** **5X6= 30 marks**

1. Clinical features and management of sjogren's syndrome **(May know)**
2. Miliary tuberculosis **(desirable to know)**
3. Drug abuse **(Must know)**
4. Management of Parkinsonism **(May know)**
5. Gonococcal infections **(May know)**

## PART - A

### I .Multiple choice question

20 X 1 = 20 Marks

1. An elderly male was operated for fracture neck of femur and since day of surgery patient is irritable, emotional blunting and avoidance of situation which evoke memories of trauma diagnosis is **(Must know)**
    - a. Panic disorder
    - b. Somatoform disorder
    - c. Post- traumatic stress disorder
    - d. OCD
  
  2. 20 years female brought to emergency room hyperventilating with fear of serious illness and no evidence of underlying organic cause and likely diagnosis is **(Must know)**
    - a. Depression
    - b. Delusion
    - c. Panic disorder
    - d. Hallucination
  
  3. Mother of a pre – university college goer brought her daughter with complaints of significant weight loss and avoidance of high calorie foods. Probable diagnosis is **(Must know)**
    - a. Cyber bullying
    - b. Factitious disorder
    - c. Anorexia nervosa
    - d. Bulimia nervosa
  
  4. Desire to void is there when bladder is **(Must know)**
    - a. 100%
    - b. 80%
    - c. 60%
    - d. 75%
  
  5. Molluscum contagiosm is caused by **(Must know)**
    - a. Pox virus
    - b. Bacteria
    - c. Fungus
    - d. Both a & b
  
  6. Prazosin is used in **(May know)**
    - a. Dog bite
    - b. Monkey bite
    - c. Snake envenomation
    - d. Scorpion sting
-

7. Risk factor for breast cancer includes **(Must know)**
- Alcohol
  - Hormone replacement therapy
  - ionizing radiation exposure
  - All of the above
8. Tumour in Zollinger – Ellison syndrome secretes **(Must know)**
- Pepsin
  - Chymotrypsin
  - Gastrin
  - Niacin
9. Beau's lines in nails are **(May know)**
- Transverse lines
  - Vertical lines
  - Lunar shaped lines
  - None of the above
10. Priapism occurs in **(May know)**
- Erectile dysfunction
  - Black widow spider bite
  - Hanging
  - Both b & c
11. Quantifying proteinuria in urine samples with clinician impression of glomerular diseases, then the report reads. **(May know)**
- Nil
  - 100 mg
  - > 300 mg
  - > 250 to 300 mg
12. Bence Jones proteinuria occurs in following conditions except **(May know)**
- Amyloidosis
  - Multiple myeloma
  - B cell disorders
  - Rhabdomyolysis
13. Generalised excessive growth of vellus hair in females is **(Must know)**
- Hypertrichosis
  - Virilisation
  - Hirsutism
  - Masochism



14. Turner syndromes karyotype **(Must know)**
- 45 XX
  - 45XO
  - 43XY
  - 42XXx
15. Following are symptoms of COPD except **(Must know)**
- Menstrual irregularity
  - Androgen excess
  - Hyperesis
  - Ovarian cyst.
16. Anxious mother with complaints of his son doing poor at studies with tall stature, gynecomastia, and firm tests. Likely to be a case of **(Must know)**
- Kluchitsky syndrome
  - Munchasans syndrome
  - Turner syndrome
  - Klinefelter syndrome
17. Achalasia is characterized by **(Must know)**
- Hypotonic lower oesophageal sphincter
  - Actively propagated esophageal contraction
  - Excessive release of nitric acid by inhibitory neurons in lower esophageal sphincter
  - Hypertonic lower oesophageal sphincter
18. Tropical sprue occurs mainly in **(Must know)**
- Greenland
  - Indonesia
  - Antarctica
  - Canada
19. Following are cutaneous manifestation of cancer except **(May know)**
- Mole
  - Acanthosis nigricans
  - Pruritis
  - Vitiligo
20. A circumscribed flat area of altered colour in skin is **(Must know)**
- Papule
  - Rash
  - Macule
  - Wheal

## **BOOKS RECOMMENDED**

### **CLINICAL METHODS**

- Hutchinson's clinical methods, 23<sup>rd</sup> Edition, Michael Glyn/William Drake Sounders publications, 2012.
- Macleoid's clinical examination, 13<sup>th</sup> Edition, Churchill Livingston, 2013.

### **MEDICINE TEXT**

- Davidson's principles of practice of medicine, 22<sup>nd</sup> Edition, Churchill Livingston, 2014.
- Clinical Medicine, by Kumar and Clark, 8<sup>th</sup> Edition, Sounders publications, 2012.

### **REFERENCE BOOKS**

- Harrison's principles of Internal Medicine, 19<sup>th</sup> Edition. Dennis kasper, McGraw hill publications, 2015.

### **JORUNALS FOR REFERENCE**

- British Medical Journal. Lancet.

*"Knowledge has to be improved, challenged, and increased constantly, or it vanishes*

- *Peter Drucker*

## GENERAL SURGERY CURRICULUM

### Goals

The aim of teaching undergraduate students in General Surgery is to prepare them to have adequate knowledge of General Surgery in accordance with the institutional goals.

### Objectives

#### 1. Knowledge

At the end of training the undergraduate student should be able to: -

- a) Diagnose and appropriately treat common surgical ailments;
- b) Identify situation calling for urgent or early surgical intervention and refer at the optimum time to the appropriate centres;
- c) Requisition and interpret basic relevant investigations;
- d) Provide adequate pre and post – operative and follow – up care of surgical patients;
- e) Counsel and guide patients and relatives regarding need, implications and problems of surgery in the individual patient;
- f) Develop adequate and right attitude in dealing with surgical problems of patients;
- g) Provide emergency resuscitative measures in acute surgical situations including trauma.
- h) Organise and conduct relief measures in situations of mass casualties.
- i) Effectively participate in the National Health Programmes especially the Family Welfare Programme.
- j) Discharge effectively medico-legal and ethical responsibilities.
- k) Perform simple routine surgical procedures.

#### 2. Skills

At the end of the course the students shall be able to:

1. Obtain a proper relevant history and perform a humane and thorough clinical examination including internal examinations (per-rectal and per – vaginal)
2. And examinations of all organs/ systems in adults and children.
3. Arrive at a logical working diagnosis after clinical examination.
4. Order appropriate investigations keeping in mind their relevance (need based)and cost effectiveness.
5. Plan and institute a line of treatment which is need based, cost effective and appropriate for common ailments taking into consideration:
  - a) Patient;
  - b) Disease;
  - c) Socio – economic status;
  - d) Institutional/governmental guidelines.
6. Recognize situations which call for urgent or early treatment at secondary and tertiary centres and make a prompt referral of such patients after

- giving first aid or emergency treatment.
7. Demonstrate empathy and humane approach towards patients, relatives and attendants.
  8. Develop a proper attitude towards patients, colleagues and other staff.
  9. Demonstrate interpersonal and communication skills befitting a surgeon in order to discuss the illness and its outcome with patient and family.
  10. Establish rapport and talk to patients, relatives and community regarding all aspects of medical care and disease.
  11. Write a complete case record with all necessary details.
  12. Write a proper discharge summary with all relevant information.
  13. Write a proper referral note to secondary or tertiary centres or to other surgeons with all necessary details.
  14. Assess the need for an issue proper medical certificates to patients for various purposes.
  15. Maintain an ethical behavior in all aspects of medical practice.
  16. Appreciate patients' right to privacy.
  17. Obtain informed consent for any examination/procedure.
  18. Be able to do surface marking of common superficial arteries, veins, nerves and viscera.
  19. Access and manage fluid/ electrolyte and acid base imbalance.
  20. Adopt universal precautions for self protection against HIV and hepatitis and counsel patients.
  21. Start i.v. line and infusion in adults, children and neonates.
  22. Do venous cutdown.
  23. Give intradermal / SC/ IM/IV injection.
  24. Insert and manage a C.V.P line.
  25. Conduct CPR (Cardiopulmonary resuscitation) and first aid in newborns, children and adults including endotracheal intubation.
  26. Pass a nasogastric tube.
  27. Pass a stomach tube and do stomach wash.
  28. Perform vasectomy.
  29. Perform circumcision.
  30. Perform reduction of paraphimosis.
  31. Do Proctoscopy.
  32. Do injection and banding of piles  
Incise and drain superficial Abscesses; do dressing.
  33. Manage superficial wounds and do suturing of superficial wounds & wound toilet.
  34. Remove small cutaneous/ subcutaneous swelling  
Control external haemorrhage.
  35. Catheterise bladder in both males and females.
  36. Perform nerve blocks like infiltration, digital, pudendal, paracervical and fieldblock.
  37. Relieve tension pneumothorax by inserting a needle. Insert flatus tube.
  38. Provide first aid to patients with peripheral vascular failure and shock.
  39. Assess degree of burns and administer emergency management
-

## **SYLLABUS**

### **GENERAL SURGERY INCLUDING ORTHOPAEDICS PRINCIPLES**

#### **MUST KNOW**

1. Metabolic response to injury
2. Shock and Blood transfusion
3. Wounds, Tissue Repair and Scars
4. Basic Surgical Skills and anastomoses
5. Surgical Infection
6. Surgery in the Tropics
7. Patient Safety

#### **MAY KNOW**

1. Principles of Laparoscopic and Robotic Surgery
2. Principles of Paediatric Surgery
3. Principles of Oncology
4. Surgical Ethics and Law

#### **DESIRABLE TO KNOW**

1. Surgical Audit and Clinical Research

### **INVESTIGATION AND DIAGNOSIS**

#### **MUST KNOW**

1. Diagnostic Imaging
2. Gastro Intestinal Endoscopy

#### **MAY KNOW**

1. Tissue Diagnosis

### **PERIOPERATIVE CARE**

#### **MUST KNOW**

1. Pre Operative Preparation
2. Anaesthesia and Pain Relief
3. Nutrition and Fluid Therapy
4. Post Operative Care

#### **MAY KNOW**

1. Care in the operating room
2. Day case surgery

#### **DESIRABLE TO KNOW**

1. Perioperative management of the high risk surgical patient

## **TRAUMA**

### **MUST KNOW**

1. Assessment and Management of Trauma
2. Maxillofacial Trauma
3. Torso Trauma
4. Extremity Trauma
5. Burns
6. Emergency Neuro Surgery

### **MAY KNOW**

1. Introduction to Trauma
2. Neck and Spine
3. Plastic and Reconstructive Surgery

### **DESIRABLE TO KNOW**

1. Disaster Surgery

## **ELECTIVE ORTHOPAEDICS**

### **MUST KNOW**

1. The Spine
2. Upper Limb- Pathology, Assessment and Management
3. Hip and Knee
4. Foot and ankle
5. Musculoskeletal Tumors
6. Infection of the Bone and Joints

### **MAY KNOW**

1. History taking and clinical examination in musculoskeletal disease
2. Paediatric Orthopaedics

### **DESIRABLE TO KNOW**

1. Sports Medicine and Sports Injury

## **SKIN AND SUBCUTANEOUS TISSUE**

### **MUST KNOW**

1. Skin and Subcutaneous tissue

## **HEAD AND NECK**

### **MUST KNOW**

1. Cleft lip and palate: Development abnormalities of the face, mouth and Jaws
2. Pharynx, Larynx and Neck
3. Oropharyngeal cancer
4. Disorders of the salivary gland

### **MAY KNOW**

1. Nose and Sinus
2. The Ear
3. Elective Neuro Surgery

### **DESIRABLE TO KNOW**

1. Eye and Orbit

## **BREAST AND ENDOCRINE**

### **MUST KNOW**

1. The Thyroid and Para Thyroid glands
2. The Breast

### **MAY KNOW**

1. The Adrenal Glands and other abdominal endocrine disorders

## **CARDIOTHORACIC**

### **MAY KNOW**

1. Cardiac Surgery
2. The Thorax

## **VASCULAR**

### **MUST KNOW**

1. Arterial Disorders
2. Venous Disorders

### **MAY KNOW**

1. Lymphatic Disorders

## **ABDOMINAL**

### **MUST KNOW**

1. Abdominal Wall, Hernia and Umbilicus
2. The Peritoneum, Omentum, Mesentery and Retroperitoneal Sp
3. Oesophagus
4. Stomach and Duodenum
5. The Gall Bladder and Bile Duct
6. The Pancreas
7. Small and Large Intestine
8. Intestinal Obstruction
9. The Vermiform Appendix
10. The Rectum
11. The Anus and Anal Canal

### **MAY KNOW**

1. History and Examination of Abdomen
2. Spleen
3. The Liver

### **DESIRABLE TO KNOW**

1. Bariatric Surgery

## **GENITO URINARY**

### **MUST KNOW**

1. Urinary Symptoms and Investigations
2. The Kidneys and Ureters
3. The Prostate and seminal Vesicles
4. Testis and Scrotum

### **MAY KNOW**

1. Urinary bladder
2. Urethra and Penis

### **DESIRABLE TO KNOW**

1. Gynecology

## **TRANSPLANTATION**

### **DESIRABLE TO KNOW**

1. Transplantation



## **(B) RADIOTHERAPY**

### **COURSE CONTENTS:**

#### **MUST KNOW**

1. Physical principal of radiotherapy.
2. Principles of cancer chemotherapy.
3. Prevention of cancer.
4. Early diagnosis of cancer.
5. Principles of nuclear medicine.
6. Common radiation reactions and management

#### **MAY KNOW**

1. Radio-responsiveness of various tumours.
2. Radiotherapy in some of the commonly seen cancers.
3. Chemotherapy in certain cancers like childhood tumours, leukemia and lymphomas.

#### **DESIRABLE TO KNOW**

1. Radio-isotopes in diagnosis and therapy.

## **(C) ANAESTHESIOLOGY**

### **COURSE CONTENTS:**

#### **MUST KNOW**

1. Anatomy of upper airway: sites of respiratory obstruction and management of airway in an unconscious patient.
2. Infiltration anaesthesia.
3. Digital Block.
4. Management of complication of regional anaesthesia.
5. The Principles of administration of general anaesthetics.

#### **MAY KNOW**

1. The Pharmacology of local anesthetics, their use and how to perform simple nerve blocks.
2. Ankle block.
3. Various methods of oxygen therapy and its indications

#### **DESIRABLE TO KNOW**

1. Pudendal and Paracervical blocks.

## UNIVERSITY EXAMINATION PATTERN

### THEORY

Paper – I & II each Three hours and marks 240

#### Paper I – General Surgery and Allied Specialties

1. Principles of Surgery
2. Investigation and diagnosis
3. Perioperative care
4. Trauma
5. Skin and subcutaneous tissue
6. Head and Neck
7. Breast and Endocrine

#### Paper II – General Surgery including Orthopedics

1. Cardiothoracic
2. Vascular
3. Abdominal
4. Genitourinary
5. Transplantation  
&  
1. Orthopedics

#### PAPER – 1

<b>PART A</b>	MCQ		20 marks
<b>PART B</b>	1 Essay		20 marks
	5 Short notes	each 6 marks	30 marks
<b>PART C</b>	1 Essay		20 marks
	5 Short notes	each 6 marks	30 marks

#### PAPER – II

<b>PART A</b>	MCQ		20 marks
<b>PART B</b>	1 Essay		20 marks
	5 Short notes	each 6 marks	30 marks
<b>PART C</b>	1 Essay		20 marks
	5 Short notes	each 6 marks	30 marks

Note: Total Marks: 240

Must obtain 50 % for a pass

**MBBS DEGREE EXAMINATION  
FINAL YEAR MBBS  
GENERAL SURGERY PAPER I & II**

**Time: 3 Hrs**

**Total Marks: 120**

**PART - A (20 marks)**

**Multiple choices Question (1-20)                      20x1=20 Marks**

    Must know              14

    May know              6

**PART - B (50 marks)**

**I. Essay Question    1x20=20 Marks**

    1. (Must know)

**II. Write Short notes on:                                      5x6 = 30 Marks**

1. (Must Know)
2. (Must Know)
3. (May Know)
4. (May know)
5. (Desirable to know)

**PART - C (50 marks)**

**I. ESSAY Question    1x20=20 Marks**

    1. (Must Know)

**II. Write short notes on                                      5x6=30 Marks**

1. (Must Know)
2. (May Know)
3. (May Know)
4. (May Know)
5. (Desirable to know)

**Model Question Paper**  
**MBBS Degree examination**  
**Final Year MBBS**  
**Paper I – MBS15403 General Surgery and Allied Specialties**

Time: Three hours  
Two hours and Forty minutes  
For Part – B & Part – C

Max. Marks: 120  
Part-A: 20 marks  
Part-B & Part-C: 100 marks

Use OMR coding sheet for answering Part – A  
Use separate Answer Books for Part – B & Part - C

Illustrate the answer with suitable diagrams  
Answer ALL Questions

**PART – B (50 Marks)**

**I. Essay Questions** **(1 x 20 = 20 marks)**

1. Discuss the etiology, clinical features, staging and management of carcinoma of Stomach **(Must Know)**

**II. Write short notes on:** **(5 x 6 = 30 marks)**

1. Graft rejection **(Desirable to Know)**
2. Flail Chest **(May Know)**
3. Complications of Blood Transfusion **(Must Know)**
4. Hypospadias **(May Know)**
5. Pseudocyst of Pancreas **(Must Know)**

**PART – C (50 Marks)**

**I. Essay Questions** **(1 x 20 = 20 marks)**

1. Discuss the clinical features, diagnosis and management of acute pancreatitis. **(Must Know)**

**II. Write short notes on:** **(5 x 6 = 30 marks)**

1. Trucut Biopsy **(May Know)**
2. Surgical Audit **(Desirable to Know)**
3. Complications of Splenectomy **(May Know)**
4. Lucid interval **(May Know)**
5. Acute Appendicitis **(Must Know)**

**PART – A (20 x 1 = 20)**

**Choose the appropriate answer:**

1. Insuflated gas in Laparoscopic surgery is **(May Know)**  
a. Oxygen                      b. Carbon Monoxide      c. Methane      d. Carbon dioxide
2. Brachytherapy is type of **(May know)**  
a. Angiography                      b. Radiotherapy  
c. Immunotherapy                      d. Chemotherapy
3. Benign neoplasm arising from enamel forming cells **(May know)**  
a. Osteoma                      b. Ameloblastoma  
c. Osteoclastoma                      d. Giant cell granuloma
4. Common cause for constipation in children is **(May know)**  
a. Anal fissure                      b. Hirschsprung's disease  
c. Neuropathic bowel                      d. Hard stools
5. Organs not involved in multiple endocrine neoplasia is **(May know)**  
a. Thyroid                      b. Testis                      c. Mucousmembrane      d. adrenal
6. Weber- Ferguson incision is used in **(May know)**  
a. Maxillectomy                      b. Mandibulectomy  
c. Parotidectomy                      d. Radical neck dissection
7. The Glasgow coma score 3-8 is **(Must know)**  
a. Mild head injury                      b. severe head injury  
c. Moderate head injury                      d. Minor head injury
8. Blunt trauma to the abdomen most commonly injuries **(Must know)**  
a. Liver                      b. Kidney                      c. Spleen                      d. Pancreas
9. An acute increase in intracranial pressure is characterized by **(Must know)**  
a. Respiratory irregularities                      b. Decreased blood pressure  
c. Tachycardia                      d. Papilloedema
10. A 3 year old child with congenital cyanosis is most probably suffering from **(Must know)**  
a. Tricuspid atresia                      b. Ventricular septal defect  
c. Tetralogy of fallot                      d. Patent ductus arteriosus

11. Marjolin's ulcer may develop in **(Must know)**
  - a. Ionizing radiation
  - b. long standing venous ulcer
  - c. Exposure to sun light
  - d. fissure in ano
12. Incidence of calculi in submandibular salivary gland **(Must know)**
  - a. 80%
  - b. 50%
  - c. 30%
  - d. 10%
13. The nerve preserved in modified radical neck dissection **(Must know)**
  - a. Facial nerve
  - b. Nerve to serratus anterior
  - c. Spinal accessory nerve
  - d. Lingual nerve
14. The diagnosis of acute appendicitis is most difficult in **(Must know)**
  - a. persons above 60 years
  - b. pregnant women
  - c. Infants
  - d. Women aged 18 – 35 years
15. The simplest formula used for fluid replacement in burns patient is **(Must know)**
  - a. Sutherland formula
  - b. Parkland formula
  - c. Curreri formula
  - d. Muir and Barclay formula
16. Predominant pyogenic organism causing tissue necrosis is **(Must know)**
  - a. Streptococcus
  - b. Actinomyces
  - c. Staphylococcus aureus
  - d. Mycobacterium
17. Severe form of stomatitis due to infective gangrene is **(Must know)**
  - a. Cancrum oris
  - b. Ulcerative gingivitis
  - c. Thrush
  - d. Monilial stomatitis
18. The most common type of malignant melanoma **(Must know)**
  - a. Nodular melanoma
  - b. Lentigo maligna melanoma
  - c. Acral lentiginous melanoma
  - d. superficial spreading melanoma
19. Thrombophlebitis of the superficial veins of breast and anterior chest wall is **(Must know)**
  - a. Bacterial mastitis
  - b. Mondor's disease
  - c. Periductal mastitis
  - d. Mastitis of infants
20. Compensatory mechanisms during acute haemorrhage include **(Must know)**
  - a. Decreased cerebral and coronary blood flow
  - b. Early morning hypoglycemia
  - c. Renal and Splanchnic Vasodilatation
  - d. Increased respiratory rate

**Model Question Paper**  
**MBBS Degree examination**  
**Final Year MBBS**  
**Paper II – MBS15404 General Surgery including Orthopedics**

Time: Three hours  
Two hours and Forty minutes  
For Part – B & Part – C

Max. Marks: 120  
Part-A: 20 marks  
Part-B & Part-C: 100 marks

Use OMR coding sheet for answering Part – A  
Use separate Answer Books for Part – B & Part - C

Illustrate the answer with suitable diagrams  
Answer ALL Questions

**PART – B (50 Marks)**

**I. Essay Questions** **(1x 20 = 20 marks)**

1. Define: Shock. What are the types of shock? Discuss the pathophysiology, diagnosis and treatment of haemorrhagic of hypovolemic shock. **(Must know)**

**II. Write short notes on:** **(5 x 6 = 30 marks)**

1. Seminoma Testis **(Must know)**
2. ERCP **(May Know)**
3. GCS **(May Know)**
4. Tension pneumothorax **(Desirable to Know)**
5. Gall stones **(Must know)**

**PART – C (50 Marks)**

**I. Essay Questions** **(1x20 = 20 marks)**

1. Discuss about the mechanism of injury, diagnosis, classification, treatment and complications of Supracondylar fracture of the humerus. **(Must Know)**

**II. Write short notes on:** **(5 x 6 = 30 marks)**

1. Osteoclastoma **(May Know)**
2. Chronic Osteomyelitis **(Must know)**
3. Arthroscopy **(May Know)**
4. Club Foot **(Desirable to Know)**
5. Frozen Shoulder **(May know)**

**PART – A (20 x 1 = 20)**

**Choose the appropriate answer:**

1. Vascular inflow occlusion of liver is achieved by **(May know)**
    - a. Pringle manoeuvre
    - b. Chovanec manoeuvre
    - c. Putverdan manoeuvre
    - d. Taxis manoeuvre
  
  2. TIPS involves creation of shunt between **(May know)**
    - a. Portal vein and inferior vena cava
    - b. Portal vein and hepatic vein
    - c. Hepatic vein and inferior vena cava
    - d. Portal vein and hepatic artery
  
  3. Meckel's diverticulum is a derivative of **(May know)**
    - a. Allantois
    - b. Vitellointestinal duct
    - c. Ventral mesorchium
    - d. Ductus arteriosus
  
  4. Wrist drop is seen in paralysis of **(May know)**
    - a. Radial nerve
    - b. Ulnar nerve
    - c. Median nerve
    - d. Axillary nerve
  
  5. The common sites for a fracture in osteoporosis are **(May know)**
    - a. Neck of femur
    - b. Dorsolumbar spine
    - c. Head of humerus
    - d. All of the above
  
  6. The most common cause of allograft rejection **(May know)**
    - a. HLA antigen
    - b. ABO Blood group antigen
    - c. Anti B antibody
    - d. Anti A antibody
  
  7. Precancerous lesion of gall bladder is **(Must know)**
    - a. Porcelain gallbladder
    - b. Mirizzi syndrome
    - c. Cholesterosis
    - d. Obstructive jaundice
  
  8. Whipple's trial is seen in **(Must know)**
    - a. Insulinoma
    - b. Pheochromocytoma
    - c. Gastrinoma
    - d. Syphilis
  
  9. The procedure of choice for elective removal of CBD stones in most patients is **(Must know)**
    - a. Open choledocholithotomy
    - b. Endoscopic choledocholithotomy
    - c. Laparoscopic choledocholithotomy
    - d. Percutaneous choledocholithotomy
  
  10. Which of the following is not included in Ranson's criteria for acute pancreatitis? **(Must know)**
    - a. Age > 55 years
    - b. Blood glucose > 200 mg %
    - c. WBC count > 1600/mm<sup>3</sup>
    - d. Serum calcium > 8 mg%
-



11. Barrett's esophagus is diagnosed by **(Must know)**  
a. Squamous metaplasia                      b. Intestinal metaplasia  
c. Squamous dysplasia                      d. none of the above
12. Adenocarcinoma of esophagus develops in **(Must know)**  
a. longstanding achalasia                      b. Barrett's esophagus  
c. Corrosive stricture                      d. Alcohol abuse
13. The most common site for Benign gastric ulcer is **(Must know)**  
a. Upper third of lesser curvature  
b. Greater curvature  
c. Pyloric antrum  
d. Lesser curvature near incisura angularis
14. The artery involved in duodenal ulcer bleeding **(Must know)**  
a. Splenic artery                      b. Left gastric artery  
c. Gastroduodenal artery                      d. Superior mesenteric artery
15. Duodenal blowout is **(Must know)**  
a. Production of nitrosamines                      b. Iatrogenic during endoscopy  
c. Complication of partial gastrectomy                      d. Trauma of duodenum
16. H.pylori infection causes carcinoma by which mechanism **(Must know)**  
a. Production of nitrosamines                      b. Gastric Metaplasia  
c. Increased acid secretion                      d. Causing mutation
17. Strawberry gallbladder is seen in **(Must know)**  
a. Gangrene of gallbladder                      b. Carcinoma of gallbladder  
c. Cholesterosis                      d. Acalculous cholecystitis
18. Monteggia fracture is **(Must know)**  
a. Fracture of lower (1/3) of ulna  
b. Fracture of upper third of ulna with dislocation of radial head  
c. Fracture of upper third of fibula with dislocation  
d. Fracture of lower (1/3) of ulna with dislocation of radial head
19. Following complication can occur after fracture neck of femur **(Must know)**  
a. Avascular necrosis of head of femur                      b. Non union  
c. Late osteoarthritis                      d. Mal union
20. The Tendon / muscle mostly involved rotator cuff injuries of shoulder is **(Must know)**  
a. Supraspinatus                      b. Infraspinatus  
c. Subscapularis                      d. Deltoid

## **ADDENDA (Suggested further questions)**

1. CT Scan
2. MRI Scan
3. Duplex Doppler studies
4. USG- abdomen/thyroid/breast
5. IVU
6. Laparoscopic Surgery
7. Robotic Surgery
8. Stem Cell therapy
9. MRCP

## **BOOKS RECOMMENDED FOR SURGERY**

1. Short Practice of Surgery, by Bailey & Love, 26<sup>th</sup> Edition, publisher by Arnold, 2013.
2. A manual of Clinical Surgery by Doss -8<sup>th</sup> Edition, Doss publication 2008.
3. Clinical methods in Surgery by Hamilton Bailey. Clinical Hamilton Bailey.

## **BOOKS RECOMMENDED FOR ORTHOPAEDICS**

1. Orthopaedics Traumatology, by Mayilvahanan Natarajan, 7<sup>th</sup> Edition, Lippincott, 2011.
2. ADAMS Outline of Orthopaedics, by David L.Hamblen, 14<sup>th</sup> Edition, Churchill Livingstone, 2010.
3. Outline of Fractures by Crawford Adams, 11<sup>th</sup> Edition, Churchill Livingstone, 1999.

## **REFERENCE BOOKS**

1. Schwartz principles of surgery – Brunicaardi 10<sup>th</sup> edition MCGraw Hill, 2014
2. Grainger & Allison's Diagnostic Radiology - A.Adam / A. Dixon. 2 volume6<sup>th</sup> Edition Elsevier, 2014.
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## JOURNALS FOR REFERENCE

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*“Great thoughts speak only to the thoughtful mind, but great actions speak to all man kind”*

- Theodore Roosevelt

## **OBSTETRICS & GYNAECOLOGY CURRICULUM**

### **Goals**

The aim of teaching undergraduate students in Obstetrics & Gynaecology is to prepare them to have adequate knowledge of Obstetrics & Gynaecology in accordance with the Institutional goals.

### **Objectives Knowledge**

At the end of training, the undergraduate student should be able to:

- a) Appreciate the socio-cultural, economic and demographic factors that influence the practice of Obstetrics and Gynaecology.
- b) Appreciate the principles of reproductive anatomy and physiology.
- c) Understand the preconception, antenatal, intra natal and post-natal factors including drugs that affect the mother and foetus.
- d) Recognise the changes and adaptation that occur in the mother during pregnancy, labour and puerperium.
- e) Impart antenatal care, detect deviations from normal pregnancy and refer risk cases appropriately.
- f) Manage normal labour, recognize the factors that may lead to complications and refer such cases appropriately.
- g) Institute primary treatment in Obstetrics and Gynaecological emergencies.
- h) Resuscitate and take adequate care of the newborn.
- i) Assist couples with infertility and those requiring contraception.
- j) Know the aetiopathology and management of menstrual abnormalities.
- k) Know about the benign and malignant tumours of the genital tract and appreciate the need for screening and prevention.
- l) Recognize the importance of infections and other diseases of the genital tract and appreciate the need for screening and prevention.
- m) Recognizes the importance of infections and other diseases of the genital tract and give appropriate treatment.
- n) Know about the displacements of genital tract and injuries.
- o) Understand the implications of medico legal and ethical issues concerning the specialty.
- p) Acquire communication, decision making and managerial skills.
- q) Acquire skills to perform Obstetrical and Gynaecological Examination and certain minor investigations and therapeutic co operative procedures.

## **Skills**

At the end of the course the students shall be able to:

Obtain proper relevant history and thorough clinical examination.

Arrive at a logical working diagnosis after examination. To order appropriate investigations.

Plan & institute line of treatment which is need based, cost effective & appropriate for common ailments taking into consideration.

To Recognize situations which call for urgent/ early treatment at secondary and tertiary centres and make a prompt referral of such patients after giving first aid or emergency treatment.

Demonstrate interpersonal & communication skill befitting a physician in order to discuss outcome with patient and family.

Determine gestational age. Maintain an ethical behavior.

Obtain informed consent for any examination / procedure.

Motivate colleagues, community and patient to participate actively in national health programmes.

To write a complete case record with all necessary details.

To write a proper discharge summary with all relevant information.

To write a proper referral note to secondary and tertiary institutions with all necessary details.

To assess the need for and issue proper medical certificate to patient for various purposes.

To organise antenatal, postnatal & well baby clinics.

To plan & manage health camps and family welfare camps.

To accept universal precaution for self protection against HIV, Hepatitis and counsel patients.

To do & examine a wet film vaginal smear for Trichomoniasis and fungal infection.

To take Pap smear.

To take a punch biopsy of cervix. To conduct normal vaginal delivery.

To do artificial rupture of membranes. To perform & suture episiotomies.

To apply outlet forceps.

To do postpartum tubectomy.

To perform MTP in I trimester and to be able to do evacuation in incomplete abortions.

To insert and remove IUCD.

To be able to diagnose & provide emergency care for ante partum & postpartum haemorrhage.

## **HIGHLIGHTS**

The curriculum has been designed as per MCI recommendations. Graduate medical curriculum is oriented towards training students to undertake the responsibility of a general practitioner who is capable of looking after the preventive, promotive, curative and rehabilitative aspects of medical care.

This has to be further intensified by providing exposure to field practice areas and training during the internship period. Curriculum objectives often refer to areas of scientific knowledge, they are best taught in a setting of clinical relevance with hands on experience for the students to assimilate the knowledge and make it a part of their own working skills.

The graduate medical education in clinical subjects should be based primarily on coaching in the wards and in outpatient and emergency departments in small groups, preferably not more than ten students so that a teacher can give personal attention to each student. Proper records of the work should be maintained, which will form the basis for the students internal assessment. Every attempt must be made to avoid compartmentalization of disciplines and to achieve both horizontal & vertical integration throughout the MBBS course. Students used to be encouraged to participate in group discussion, and seminar. Group discussion should not have more than 20 students. Faculty members should avail of modern educational technology while teaching the students.

MCI has allocated approximately 300 hours for teaching obstetrics & Gynecology- for theory classes including didactic lectures, demonstration and the seminars in addition to clinical

postings. The clinical lectures shall be held from 4<sup>th</sup> semester onwards. The clinical postings to be started from 3<sup>rd</sup> semester onwards. The clinical postings shall be 3 hours daily during the forenoon.

## **CURRICULUM**

### **GOALS**

The aim of teaching undergraduate students in obstetrics and Gynaecology is to prepare them to have adequate knowledge of Obstetrics and Gynaecology in accordance with the institutional goals.

### **OBJECTIVES**

At the end of training the students should be able to do have a better understanding & clinical knowledge in the field of O&G.

Must Know (60%), May Know (30%) and Desirable to Know (10%)

## **OBSTETRICS**

### **MUST KNOW**

1. Pelvis
  - Structure , Planes & Diameters
  - Classification of the Pelvis
2. Females Organs of Generation
  - External Genital Organs
  - Internal Genital Organs
  - Blood Supply
3. Physiology of Ovulation
  - Ovaries Follicular Development
  - Ovarian Steroidogenesis
  - Changes in Endometrium, Vagina , Cervix
  - Neurohormonal Control of ovarian function
4. Fertilization & Development of Embryo
  - Fertilization
  - Development of Embryo
  - Fetal membrane & Placenta
  - Liquor Amnii
  - Placenta
  - Fetal Circulation
5. Physiology of Pregnancy
  - Maternal Changes in Pregnancy
  - Diagnosis of Pregnancy
6. Fetus in Normal Pregnancy
  - Fetal Head
  - Diameters of Fetal Skull
  - Fetal Attitude , lie, Presentation & Position
7. Prenatal Care

- Preconception Care
  - Antenatal Care
  - 8. Antepartum Fetal Surveillance
  - 9. Physiology of Labour & Puerperium
    - Causation & Stages of Labour
    - Mechanism of Labour
    - Conduct of Normal Labour
    - Intrapartum Surveillance
  - 10. Puerperium
    - Changes during Puerperium
    - Care of the Mother
    - Physiology of Lactation
  - 11. Complication of Pregnancy
    - Hyperemesis gravidarum
    - Abortion
    - Ectopic pregnancy
  - 12. Vesicular Mole
  - 13. Anaemia in Pregnancy
    - Definition
    - Hematological Changes
    - Causes
    - Management
    - Complications
  - 14. Hypertensive Disorders of Pregnancy
    - Classification
    - Risk Factors
    - Pathogenesis
    - Pathological Changes
    - Diagnosis
    - Management
    - Eclampsia
    - Chronic HT
    - HELLP
  - 15. APH
    - Causes
    - Abruptio Placenta
    - Placenta Previa
  - 16. Preterm Labour
    - Definition
    - Pathogenesis
    - Prevention
    - Causes
    - Management
  - 17. PPROM
  - 18. IUGR
    - Definition, Causes
    - Classification
-



- Diagnosis
- Management
- 19. Prolonged Pregnancy
  - Definition
  - Etiology
  - Diagnosis
  - Management
  - Complications
- 20. Multiple Pregnancy
  - Twin ( Incidence, Types, Risk factors, Complications , Management )
- 21. Rh Isoimmunisation
  - Definition & Pathology
  - Management
- 22. Disease of CVS
  - Cardiovascular Changes
  - Heart Diseases (Types, Classification, Diagnosis, Management, Contraception, Indication for MTP)
- 23. Liver Disease in Pregnancy
  - Intrahepatic Cholestasia
  - Viral Hepatitis
- 26. TB & Pregnancy
  - Anti TB Drugs & Teratogenicity
- 25. Maternal infections during pregnancy
  - Rubella, Syphilis, HIV, Chicken pox, Toxoplasma, CMV infections
- 27. Diabetes in pregnancy
  - Definition, Classification, Complications, Risk factors, Screening, Management, Prepregnancy counseling
- 26. Diseases of the urinary system
  - Urinary tract changes
  - UTI
  - Asymptomatic bacteriuria
  - Acute pyelonephritis
  - Acute renal failure
- 27. Tumours of the uterus & adnexa
  - Fibroid complicating pregnancy
  - Ovarian Tumours complicating pregnancy
- 28. Abnormal fetal presentations
  - Occipitoposterior
  - Occipitotransverse
  - Face presentation
  - Brow presentation
  - Compound presentation
  - Transverse lie
  - Oblique lie
  - Breech presentation
  - Cord presentation/cord Prolapse
- 29. Dystocia

- Uterine action in labour
  - Partography
  - Types of uterine dysfunction
  - Hypotonic inertia
  - Hypertonic uterine activity
  - Precipitate labour
  - Cervical dystocia
  - CPD
  - Shoulder dystocia
30. Abnormalities of the reproductive tract
- Vulval haematoma
  - Cervical stenosis
  - Uterine malformation
  - Pregnancy & labour in uterine malformation
  - Management of uterine anomalies
  - Retroversion of uterus
31. Complications of 3<sup>rd</sup> stage of labour
- PPH (Definition, Types, Causes, Prevention, Management)
  - Secondary PPH
  - Retained & adherent placenta
32. Injuries to the parturient canal
- Injuries to the vulva (Vulval hematoma)
  - Perineal injuries
  - Lacerations of the cervix & vagina
  - Rupture of the uterus
33. Puerperal infection
- Definition
  - Causes
  - Puerperal fever
34. Newborn & neonatal problems
- Neonatal resuscitation
  - Assessment at birth
  - Assessment of gestational age & classification
  - Essential newborn care
  - Immunisation schedule
35. Respiratory distress
- Definition, Causes, Approach, Examination, Management
36. Neonatal sepsis
- Definition, Incidence, Diagnosis, Screening, Early onset sepsis, Late onset sepsis
37. Neonatal jaundice
- Physiological jaundice
  - Pathological jaundice (Causes, Evaluation, Complications, Investigations, Management)
  - Prolonged unconjugated hyperbilirubinemia
  - Hemolytic disease of newborn
38. Neonatal problems & management
-

- Hypoglycemia
  - Hypothermia
  - Hyperthermia
  - Retinopathy of prematurity
  - Birth trauma
39. Obstetric operations
- Forceps (Definition, Components, Classification, Types, Indications, Method, Complications, Outlet forceps)
  - Ventouse (Definition, History, Parts, Indications, Prerequisites, Contraindications, Technique, Advantages, Disadvantages)
40. Version & destructive operations
- Definition of version
  - External cephalic version
  - Internal version
  - Craniotomy
  - Cephalocentesis
  - Symphysiotomy
41. Cesarean section
- Definition, Incidence, Indications, Procedure, Types, Difficulties, Complications, Mortality & morbidity
  - Pregnancy following cesarean section
  - Peripartum hysterectomy
42. Induction of labour
- Definition, Indications, Contraindications, Risks
  - Preinduction assessment
  - Methods
  - Pharmacological techniques of induction
  - Mechanical technique
43. Miscellaneous
- Maternal mortality
  - Perinatal mortality
  - Coagulation disorders in obstetrics
44. Imaging techniques in obstetrics
- Ultrasound
  - Doppler
45. Prenatal diagnosis
- Definition
  - Indications
  - Amniocentesis
  - Chorionic villi sampling
46. Contraception
- Definition
  - Types (Natural, Barrier, IUCD, Hormonal & Permanent methods)
  - Emergency contraception
47. MTP
- I & II Trimester

## **May know**

### Pelvis

- Abnormalities of the Pelvis

### Female Organs of generation

- Innervation of female genital tract

### Fertilization & Development

- Sex determination
- Maternal Circulation

### Drugs in Pregnancy

### Anaemia

- Haemoglobinopathies
- Sickle cell anemia

### APH

- Other Causes of APH

### Multiple Pregnancy

- Higher order Multiple Pregnancy
- Twin to twin transfusion syndrome

### Rh isoimmunization

- Factor influencing Rh – isoimmunization

### Heart Disease

- Congenital cardiac disease in offspring

### Liver Disease

- Acute fatty liver in Pregnancy

### TB & Pregnancy

1. Effect of TB on Pregnancy
2. Effect of Pregnancy on TB

### Maternal Infections During Pregnancy

1. HSV Infections
2. Gonorrhoea
3. Chlamydia
4. Malaria

### Disease of the Urinary System

1. Cystitis
2. Chronic Renal Disease
3. Nephrotic Syndrome

### Tumors of the Uterus & Adxena

1. CaCx Complicating Pregnancy

### Surgical Emergencies during Pregnancy

1. Acute appendicitis

### Complications of III stage of Labour

1. Puerperal inversion of the uterus

### Puerperal Infection

1. Venous Complications In Puerperium
2. Mastitis & Breast Abscess

### 3. Cerebral Venous Thrombosis

#### Feeding of the New Born

1. Composition of Milk

#### Obstetrics Operations

1. Midcavity Forceps
2. Forceps in Occipito Posterior
3. Slipping of the Forceps

#### Destructive operations on the fetus

1. Decapitation
2. Cleidotomy
3. Evisceration

#### Imaging techniques in obstetrics

1. X-ray
2. MRI

#### Prenatal Diagnosis

1. Alpha Fetoprotein
2. Multiple Marker Screening
3. Ultra sound Screening
4. Fetal blood Sampling

#### Contraception

1. For Women with chronic Medical Conditions
2. Sheehan syndrome

### **Desirable to know**

#### **Anaemia**

Aplastic Anaemia

#### **Heart Disease**

Cardiac Surgery During Pregnancy

#### **Liver Disease**

Hepatic dysfunction in Hyperemesis

#### **Surgical emergencies during pregnancies**

Acute cholecystitis

Acute pancreatitis

#### **Abnormalities of the reproductive tract**

Abnormalities of the Vulval Outlet

Abnormalities of the Vagina

Anterior Displacement of the gravid uterus

## **Injuries to the parturient canal**

Injuries to the bony pelvis

## **Feeding of the newborn**

Recommendation for Nutritional intake

## **Neonatal Problems & their management**

Thermoregulation

## **Obstetric Operation**

Forceps in face presentation

Forceps to the aftercoming head

Forceps to the decapitated head

Kielland's Forceps

## **Prenatal Diagnosis**

Preimplantation diagnosis

# **GYNAECOLOGY**

## **Must Know**

1. Anatomy & histology of female genital tract
2. Physiology of Ovulation
3. Reproductive endocrinology of growing female child
4. Physiology of Perimenopause & menopause
5. Menopausal Symptoms
6. Postmenopausal bleeding – Causes.
7. Gynaecological Diagnosis [History, Physical examination, Pap smear, Endometrial biopsy]
8. Laparoscopy in Gynaecology.[ Indication, Techniques, Complications, Contra Indications]
9. Hysteroscopy in Gynaecology .[ Indication, Techniques , Complications , Contra Indications]
10. Imaging Modalities in Gynaecology [ HSG , Plain Radiography, USG]
11. Development of Female Genital Tract & Ovary
12. Mullerian Anomalies
13. Sexual Development & Developmental disorders
  - Principles of Sexual Development
  - Common Syndrome- Turner's syndrome, Klinefelter's syndrome
14. STD
  - Genital ulcers ( Genital Herpes, Granuloma inguinale, LGV, Chancroid, Syphilis)
  - Vaginitis ( Gonococci, Chlamydia, HIV )
  - Prevention of STD
  - Complications of STD

15. Inflammations of the Cervix & the uterus
    - Cervicitis & erosions
    - Ectropion
    - Endometritis
    - Pyometra
  16. PID
  17. TB of the genital tract
  18. Injuries of female genital tract
    - Obstetrics injuries ( Perineal injuries, Cervical injuries, Vaginal injuries)
  19. Injuries of to the intestinal tract
    - Rectovaginal fistula
  20. Diseases of Urinary System
    - Infections
    - Retention of urine
    - Incontinence of urine
  21. Infertility
    - Physiology of conception
    - Vaginismus & Dyspareunia
    - Definition, causes& treatment of male & female infertility
  22. MTP
    - I & II Trimester
  23. Contraception
    - Temporary & Permanent (Natural, Barrier, IUCD, Hormonal & male & female sterilisation)
  24. Ectopic Gestation
  25. GTD
  
  26. Disorders of Menstruation
    - Definition of Menstrual cycle irregularation
    - Amenorrhoea – primary & secondary ( Casues)
    - Polymenorrhea
    - Metrorrhagia
  27. Menorrhogia
    - AUB
    - Puberty Menorrhogia
    - Abnormal Uterine bleeding in reproductive age group
    - AUB in peri menopause & Menopause
  28. Prolapse Uterus
    - Supports of Uterus
    - Etiology
    - Clinical Features
    - Differential Diagnosis
    - Management
  29. Disease of Vagina
    - Biology of Vagina
    - Infections of Vagina
    - Inflammations of Vagina
-

- Ulcers & Neoplasms
- 30. Benign Disease of Uterus
  - Fibroid of Uterus
- 31. Endometriosis & Adenomyosis
- 32 Broad Ligament Cyst & Para Ovarian Cyst
- 33. Disorders of Ovary
  - Non Neoplastic Cyst
  - PCOS
- 34. Ovarian Tumors
- 35. Dysmenorrhoea & Premenstrual Syndrome
- 36. CIN & Carcinoma Cervix
- 37. Carcinoma Endometrium
- 38. Chorio Carcinoma of uterus
- 39. Ovarian Carcinoma
- 40. Radiation & Chemo therapy in Gynaecology
  - Radio Therapy
  - Chemo Therapy
- 41. Hormonal Therapy
  - Oestrogen
  - Progesterone
  - Androgen
  - Anti Estrogen
  - Anti Progesterone
  - Anti Androgen
  - GnRH
  - Bromocriptine
  - HCG
- 42. Pre Operative Care
- 43. Post Operative Care
- 44. Surgical Procedures
  - Dilatation & Curettage
  - Hysterectomy
  - Ovarian Cystectomy
  - Fothergill's operation
  - Pelvic Floor Repair
  - Myomectomy
  - Cervical Encirclage
  - Bartholin cyst excision / Marsupialisation



## **MAY KNOW**

1. Common Paediatric Gynaec Problems
2. Adolescent Contraception
3. Management of Menopausal Symptoms
  - Colposcopy
  - Imaging Modalities in Gynaecology (CT Scan & MRI)
  - Sexual Development & Development Disorders
- a. Intersex
  - Hirsutism
  - Injuries of Female genital tract
- b. Coital Injuries
  - Recto Vaginal Fistula
  - Disease of Urinary System
- c. Vesico Vaginal Fistula
  - Infertility
- d. ART
  - Disorders of Menstruation
- e. Management of Primary & Secondary Amenorrhoea
  - Prolapse Uterus
- f. POP- Q Classification
- g. Vault Prolapse
  - Displacement
- h. Retroversion
  - Disease of Vulva
- i. Ulcers & Infections
  - Disorders of Broad Ligament, Fallopian tube & Parametrium
- j. Tumors of Broad Ligament
  - Breast
- k. Premenstrual Mastalgia
  - Acute Pelvic Pain & Chronic Pelvic Pain
  - Vulval & Vaginal Cancer
  - Sarcoma of the Uterus
  - Hormonal Therapy
- l. SERM
- m. Pituitary Hormones
  - Surgical Procedures
- n. Conisations
- o. Sling Operations

## **DESIRABLE TO KNOW**

1. Endoscopy in Gynaecology
  - a. Salpingoscopy & Falloscopy
2. Imaging Modalities in Gynaecology
  - a. Radioneucleide Imaging
  - b. Dual Photon Densitometry
3. Vulvar STD Infections
4. STD in Adolescents
5. Injuries to the Intestinal tract
6. Displacement – Inversion
7. Diseases of the Vulva
  - a. Dystrophy
  - b. Tumors of Vulva
8. Tumors of Fallopian Tube
9. Breast
  - a. Breast Carcinoma
10. Fallopian Tube Carcinoma
11. Obesity
12. Hormonal Therapy
  - a. Growth Hormone
13. Pelvic Adhesions & its Prevention
14. Surgical Procedures
  - a. Vault Prolapse Surgeries

## UNIVERSITY EXAMINATION PATTERN

### **THEORY**

Two papers of three hours duration 80 marks each

**PAPER – I: OBSTETRICS INCLUDING SOCIAL OBSTETRICS**

**PAPER – II: GYNAECOLOGY, FAMILY WELFARE & DEMOGRAPHY**

### **PATTERN FOR PAPER – I**

Long Essays – 02x10 = 20 marks

Short Notes – 08x05 = 40 marks

MCQ's - 20x01 = 20 marks

Total -----  
80 marks

### **PATTERN FOR PAPER – II**

Long Essays – 02x10 = 20 marks

Short Notes – 08x05 = 40 marks

MCQ's - 20x01 = 20 marks

Total -----  
80 marks

**M.B.B.S. DEGREE EXAMINATION  
FINAL YEAR MBBS  
OBSTETRICS & GYNAECOLOGY PAPER -I & II**

**Time: 3 hrs**

**Max Marks: 80**

**Answer all questions  
Illustrate the answer with suitable diagrams**

**PART - A**

**I. Multiple Choice questions (20x1=20 marks) (1-20)**

Must Know - (15)

May Know - (5)

**PART - B**

**I. Essay Questions (1x10=10 marks)**

1. (Must Know)

**II Write short notes (4x5=20 marks)**

1. (Must Know)

2. (May Know)

3. (May Know)

4. (Desirable to know)

**PART - C**

**I. Essay Questions (1x10=10 marks)**

1. (Must Know)

**II Write short notes (4x5=20 marks)**

1. (Must Know)

2. (May Know)

3. (May Know)

4. (Desirable to know)

**Model Question Paper**  
**M.B.B.S. Degree Examination**  
**Final Year MBBS**

Paper I - **MBS15405 OBSTETRICS INCLUDING SOCIAL OBSTETRICS**

Time: Three hours

Max. Marks: 80

Part A – Twenty minutes

Part A – 20 marks

Part B & Part C – Two hours forty minutes

Part B & Part C – 60 marks

Use **OMR coding sheets** for answering **Part – A**  
Use **separate Answer Books** for **Part – B and Part – C**

**Part – A: MCQ – 20 questions**

**(20x01 = 20 marks)**

**PART – B**

**I. ESSAY: (10 X 1 = 10 marks)**

1. Define APH. Write the differential diagnosis & management of 24year old G2p1L1 with 32Wks of gestation with painless bleeding PV **(Must know )**

**II. SHORT NOTES: (5 X 4 = 20 marks)**

1. Malaria in Pregnancy **(May know)**
2. Cardiovascular changes during pregnancy **(Must know)**
3. Composition of Human Breast Milk **(May know)**
4. Perimplantation diagnosis **(Desirable to know)**

**PART – C**

**I. ESSAY: (10 X 1 = 10 marks)**

1. Define Caesarean section. Write about the indications of caesarean section. Discuss about the management of pregnancy after caesarean section. **(Must know)**

**II. SHORT NOTES: (5 X 4 = 20 marks)**

1. Destructive operations on the fetus **(May know)**
2. Neonatal Jaundice **(Must know)**
3. Kielland's forceps **(Desirable to know)**
4. Twin to twin transfusion syndrome **(May Know)**

**PART -A**  
**Multiple Choice questions**

**MCQs**

**20 X 01 = 20 MARKS**

1. Quickening can be felt at \_\_\_\_\_ weeks in primigranda **(Must Know)**
    - a) 14Wks
    - b) 10Wks
    - c) 16Wks
    - d) 20Wks
  2. Commonest type of vertex presentation **(Must Know)**
    - a) Left Occipito transverse
    - b) L. Occipito anterior
    - c) R. Occipito anterior
    - d) R. Occipito Posterior
  3. Deep Transverse arrest occurs in **(Must Know)**
    - a) Gynaecoid pelvis
    - b) Android Pelvis
    - c) Platypelloid pelvis
    - d) mixed pelvis
  4. Common site of implantation of tubal Ectopic pregnancy **(Must Know)**
    - a) Ampulla
    - b) Isthmus
    - c) Infundibulum
    - d) Interstitial
  5. The gold standard for diagnosis of placenta previa **(Must Know)**
    - a) Speculum Examination
    - b) USG
    - c) Bimanual Palpation
    - d) None of the above
  6. Complications of PIH include the following EXCEPT: **(Must Know)**
    - a) Eclampsia
    - b) Malpresentation
    - c) HELLP syndrome
    - d) Pulmonary edema
  7. Hegar's sign can be elicited by **(Must Know)**
    - a) 8Wks
    - b) 10Wks
    - c) 12Wks
    - d) 15Wks
  8. In rhesus isoimmunization following test are helpful Except **(Must Know)**
    - a) Rhesus genotype of husband
    - b) Direct Coombs test
    - c) Indirect Coombs test
    - d) Maternal Serum bilirubin
  9. The Complications of uterine anomalies are **(Must Know)**
    - a) Habitual abortion
    - b) Preterm Labour
    - c) Malpresentation
    - d) All of the above
  10. Post term pregnancy is defined as pregnancy beyond **(Must Know)**
    - a) EDD
    - b) 48hrs beyond EDD
    - c) 1week beyond EDD
    - d) 2weeks beyond EDD
  11. All are components of the 'Biophysical Profile' except **(Must Know)**
    - a) Fetal breathing
    - b) Fetal movements
    - c) Fetal measurements
    - d) Fetal heart rate accelerations
  12. Episiotomy is a planned perineal tear of the following degree **(Must Know)**
    - a) First
    - b) Second
    - c) Third
    - d) Fourth
-

13. Rachitic Pelvis is seen in **(May Know)**  
 a) Rickets    b) Tuberculosis  
 c) HIV    d) Hypothyroidism
14. Complication in sickle cell Anaemia is **(May Know)**  
 a) Post term Pregnancy                                b) Macrosomia  
 c) Recurrent Abortions                                d) Polyhydramios
15. Incidence of congenital cardiac disease in the off spring of females with congenital heart Diseases **(May Know)**  
 a) 1 – 2 %     b) 3 – 4 %  
 c) 5-6 %    d) 7 – 8 %
16. Drug of choice in Malaria during pregnancy **(May Know)**  
 a) Chloroquine    b) Quinine  
 c) Isoniazid    d) Pyrazinamide
17. Factors favoring uterine inversion include all of the following Except **(May Know)**  
 a) Hypertonic Uterus                                    b) Traction on the umbilical cord  
 c) Fundal implantation of the placenta            d) Improper pressure over the fundus
18. Duration of normal pureperium is **(Must Know)**  
 a) 4 weeks    b)6 weeks    c)8 weeks    d)10 weeks
19. Occipitoposterior position is most commonly seen in the following type of pelvis **(Must Know)**  
 a)gynaecoid    b)Anthropoid    c)Android    d)Platypelloid
20. All the following complications are more common in multiple pregnancy except **(Must Know)**  
 a)Spontaneous abortion                                b)Postmaturity  
 c)Congenital malformations                         d)Low birth weight babies

**Model Question Paper**  
**M.B.B.S. Degree Examination**  
**Final Year MBBS**

Paper II - **MBS15406 GYNAECOLOGY INCLUDING FAMILY WELFARE**

Time: Three hours

Max. Marks: 80

Part A – Twenty minutes

Part A – 20 marks

Part B & Part C – Two hours forty minutes

Part B & Part C – 60 marks

Use **OMR coding sheets** for answering **Part – A**  
Use **separate Answer Books** for **Part – B and Part – C**

**Part – A: MCQ – 20 questions**

**(20x 01 = 20 marks)**

**PART – B**

**I. ESSAY: (10 X 1 = 10 marks)**

1. Discuss the etiology, Pathogenesis Clinical features, staging & management of Carcinoma Cervix. **(Must Know)**

**II. SHORT NOTES: (5 X 4 = 20 marks)**

1. Dermoid cyst **(Must Know)**
2. Colposcopy **(May Know)**
3. Leiomyosarcoma **(May know)**
4. Prevention of pelvic adhesions **(Desirable to know)**

**PART – C**

**I. ESSAY: (10 X 1 = 10 marks)**

1. Define Infertility, Discuss the various causes of female infertility and management of Anovulation. **(Must Know)**

**II. SHORT NOTES: (5 X 4 = 20 marks)**

1. Supports of uterus **(Must Know)**
2. Hirsutism **(May Know)**
3. Chronic Inversion of uterus **(Desirable to Know)**
4. Vesicovaginal fistula **(May Know)**



**PART - A**  
**Multiple Choice questions**

**MCQs**

**20 X 01 = 20 MARKS**

1. The uterine artery arises from **(Must Know)**
  - a) Anterior division of internal iliac artery
  - b) External iliac artery
  - c) Abdominal aorta
  - d) Ovarian artery
2. Oligospermia is diagnosed if sperm count is less than **(Must Know)**
  - a) < 80 million
  - b) < 60 million
  - c) < 40million
  - d) < 20million
3. Symptoms of fibroid Uterus include **(Must Know)**
  - a) Menorrhagia
  - b) Abdominal lump
  - c) Infertility
  - d) All of the above
4. Treatment of pre invasive lesion of cervix include all EXCEPT **(Must Know)**
  - a) Cauterization
  - b) Laser therapy
  - c) Hysterectomy
  - d) Chemotherapy
5. Indications of Diagnostic Laparoscopy are all of the following EXCEPT **(Must Know)**
  - a) Infertility
  - b) Chronic pelvic pain
  - c) Endometriosis
  - d) Acute pelvic infection
6. Minipill is **(Must Know)**
  - a) Low dose progesterone only pill
  - b) Estrogen containing pill
  - c) Combined oral pill
  - d) Injectable contraceptive
7. Snow storm appearance is characteristic of **(Must Know)**
  - a) Hydatiform mole
  - b) Chorio carcinoma
  - c) Dysgerminoma
  - d) Missed abortion
8. Medical abortion is indicated in **(Must Know)**
  - a) < 6Wks
  - b) 6- 8 Wks
  - b) 8- 10 Wks
  - d) > 10Wks
9. Chocolate cyst of ovary occurs in **(Must Know)**
  - a) DUB
  - b) Adenomyosis
  - c) Endometriosis
  - d) PID
10. Sexually transmitted diseases are all except **(Must Know)**
  - a) Gonorrhoea
  - b) Syphilis
  - c) Hepatitis
  - d) Chlamydia

11. Vaginal PH in women during child bearing period **(Must Know)**  
a) <4 b) 4-5 c) 7 d) 8
12. Most common symptom of endometriosis **(Must Know)**  
a) Dysmenorrhoea b) Infertility  
c) Dyspareunia d) abdominal mass
13. Staging carcinoma of the vulva: Tumour is > 2cm in diameter, no nodes are involved **(May Know)**  
a) Stage I b) Stage II c) Stage III d) Stage IV
14. Previously known as Bowen's disease **(May Know)**  
a) VIN I b) VIN II c) CIN III d) CIN III
15. Cryotherapy or electrocautery is sometimes used **(May Know)**  
a) Genital Herpes b) Chlamydia  
c) Condylomata acuminata d) Syphilis
16. Toxic shock syndrome is caused by a toxin produced by **(May Know)**  
a) Staphylococcus aureus b) Lactobacillus  
c) Gardnerella d) Mycoplasma hominis
17. Chronic pelvic pain syndrome accounts for about \_% of gynaecological referrals **(May Know)**  
a) 10 b) 25 c) 40 d) 5
18. All are features of PCOS Except **(Must Know)**  
a) Polymenorrhoea b) Hirsutism  
c) Infertility d) Obesity
19. Most common type of ovarian epithelial tumour **(Must Know)**  
a) Mucinous cystadenoma b) Serous cystadenoma  
c) Endometrioid tumour d) Clear cell tumour
20. Clue cells are seen in **(Must Know)**  
a) Candidiasis b) Trichomoniasis  
c) Gonorrhoea d) Bacterial Vaginosis

## **INTEGRATED TEACHING**

- 1) Family Planning
- 2) Embryology, integrated fetal growth & development
- 3) Acute abdomen
- 4) Care of newborn
- 5) Drugs in Pregnancy
- 6) Nutrition & anemia in pregnancy
- 7) Physiological changes in pregnancy
- 8) Neonatal resuscitation problems

## **BOOKS RECOMMENDED**

1. Clinical Obstetrics by Mudaliar and Menon, 11<sup>th</sup> Edition, University Press 2011.
2. Textbook of Gynaecology, by Shaw, 16<sup>th</sup> Edition, Elsevier 2015.

## **REFERENCE BOOKS**

1. William Obstetrics by Cunningham F. Gray . 24<sup>th</sup> Edition, McGraw hill publications, 2014.
2. Recent advances in Obstetrics & Gynaecology 2 vol. William J Ledger, Jaypee 2014.
3. Operative Gynaecology by Jeline, 11<sup>th</sup> Edition, Lippincott, 2015.
4. Jeff Coates principles of Gynaecology & Infertility, 7<sup>th</sup> Edition, Jaypee 2008.
5. Obstetrics by ten teachers by Campbell Stuart, 19<sup>th</sup> Edition, Book power publication, 2011.
6. Gynaecology by ten teachers by Campbell Stuart, 18<sup>th</sup> Edition, Book power publication, 2006.
7. Practical Obstetrics problems, by IAN Donald, 7<sup>th</sup> Edition, BI Publication, 2014.
8. Textbook of Gynaecology, contraception & Demography by C.S.Dawn, 14<sup>th</sup> Edition, Dawn Books, 2003.

## **JOURNALS FOR REFERENCE**

- FOGSSI – Journal of Obstetrics & Gynaecology . British Journal of Obstetrics & Gynaecology.
- American Journal of Obstetrics & Gynaecology.

*The art and science of asking question is the source of all knowledge*

*-Thomas Berger*

## PAEDIATRICS CURRICULUM

### Goals

The aim of teaching Paediatrics to undergraduate students is to prepare them to have adequate knowledge and appropriate skills to treat Paediatric patients in accordance with the Institutional goals.

### Objectives

#### Knowledge

At the end of clinical posting, an undergraduate should have the following knowledge / skill. He /she should be able to perform the following: -

Early diagnosis of Paediatric/Neonatal diseases and give appropriate treatment.

Interpret various diagnostic tests.

Perform routine investigations and therapeutic procedures.

Counsel the parents, and relatives regarding the nature of illness and its risks.

Perform efficient cardio pulmonary resuscitation.

Identify and initiate treatment for various emergencies / Identify critical illness needing referral to tertiary centres.

Discharge Medico-legal responsibilities.

Be aware of and participate in National programmes Motivate patients for Diagnostic autopsy.

#### Skills

At the end of the course the students shall be able to:

- a. Obtain a proper relevant history and perform a humane and thorough clinical examination of all systems in children including neonates.
- b. Arrive at a logical comprehensive diagnosis after clinical examination.
- c. Order appropriate investigations keeping in mind their need, relevance and cost effectiveness.
- d. Plan and institute a line of treatment which is need based, cost effective and appropriate for common ailments taking into consideration –
  - i. Patient,
  - ii. Disease,
  - iii. Socio-economic status,
  - iv. Institutional / Governmental guidelines.

- e. Identify situations where referral to secondary or tertiary level is needed and referring promptly after first aid or emergency treatment.
- f. Show empathy and humane approach towards patient, relatives and attendants.
- g. Develop a proper professional attitude towards patient, colleagues and other staff.
- h. Maintain ethics in medical practice.
- i. Monitor growth of the child and development and diagnose the abnormal.
- j. Assess and treat fluid / electrolyte disorders and acid – base imbalance.
- k. Assess dehydration and treat diarrhoeal illness including preparation of ORS.
- l. Early detection of Nutritional disorders and treatment.
- m. Be able to write a complete case sheet.
- n. Write a proper discharge summary.
- o. Organize antenatal, postnatal, well baby and other clinics.
- p. Motivate patients and community to participate in National Health programmes.
- q. Organize and teach first aid to paramedics, with reference to pediatric age group.
- r. Adopt universal precautions against HIV.
- s. Maintain cold chain and reverse cold chain.
- t. Perform and read Mantoux test.
- u. Safe injection practices.

## **HIGHLIGHTS**

This curriculum has at its core MCI recommendations. An attempt has also been made, to incorporate newer trends in teaching methodology as well as to include recent advances in Paediatrics in the syllabus.

This holistic approach is designed so that a graduate once he acquires the Degree is able to discharge the responsibility of general practitioner in such a manner that he can give proper primary child health care.

Clinical subjects must essentially be based on bedside teaching. Therefore clinical posting in Paediatrics is oriented towards teaching in Ward, OPD and Emergency departments. The size of each group of students posted is planned to be small so that teaching takes a personal bearing.

Curriculum objective has been to impart essential clinical knowledge so that he/she becomes capable of working up and treating a child case in a logical way inculcating preventive and socioeconomic aspects also in care.

## **CURRICULUM**

A minimum of 100 hours has been allotted during the course. This is the suggested minimum. Extra hours are allowed whenever needed. The allocation of cases and marks is given separately in annexure. The lecture classes will be conducted by Professors and Assistant Professors by rotation.

## **DETAILS OF CLINICAL POSTINGS**

During the Clinical posting, students shall be taught for three hours in the forenoon from 9 Am to 12 Noon.

In clinical posting, students are trained in Wards and Out-patient departments in small groups. The emphasis during clinical teaching is adequate and thorough history taking including Nutritional history and Vaccination, proper methods of clinical examination with subsequent discussion about diagnosis and management.

Apart from clinical cases, the following are also taught / demonstrated to students.

1. Cold chain maintenance.
2. Vaccination techniques.
3. Cardio Pulmonary Resuscitation.
4. New born Resuscitation.
5. Starting IV line.
6. Universal precautions
7. Interpretation of Mantoux test.
8. Lumbar Puncture

## RECORD NOTE BOOK

Every effort is made to ensure proper Record keeping of the cases examined by the students during the clinical posting. A minimum of 10 cases examined by the students is maintained as a record containing the detailed history, clinical findings, investigations and treatment and submitted for evaluation.

## SYLLABUS

- Must Know (60%)
- May know (30%)
- Desirable o Know (10%)

### CVS

#### Must Know

1. Acyanotic HD – VSD, PDA, ASD
2. Cyanotic HD – TOF
3. Acquired – Rheumatic heart disease
4. CCF

#### May Know

1. Coarctation for Aorta
2. Infective endocarditis
3. Hypertension
4. Myocarditis
5. Arrhythmias

#### Desirable to Know

1. Cardiomyopathy
2. Pericardial effusion

### RS

#### Must Know

1. Acute Bronchiolitis
2. Pneumonia
3. Bronchial asthma
4. Pulmonary TB
5. ALTB
6. Acute epiglottitis
7. Stridor
8. Foreign body aspiration
9. Kerosene pneumonitis

#### May Know

1. Bronchiectasis
2. Pleural effusion
3. Pyopneumothorax
4. Suppurative otitis media
5. Acute adenotonsillitis

Desirable to Know

1. Cystic Fibrosis
2. Pneumomediastinum
3. Emphysema
4. Pulmonary function tests

**ABDOMEN**

Must Know

1. Acute gastroenteritis
2. Hepatitis
3. Cirrhosis & CLD
4. Intussusception
5. Acute appendicitis
6. TB abdomen
7. Diarrheal disease
8. Torsion testis / Acute scrotum

May Know

1. Constipation
2. Ascites
3. Meckel's diverticulitis
4. Hirschsprung's disease
5. Oral thrush

Desirable to Know

1. Hypertrophic pyloric stenosis
2. GERD
3. Hernias
4. Undescended testis
5. Phimosis
6. Malabsorption

**CNS**

Must Know

1. Seizures & febrile fits
2. Meningitis pyogenic / TB / Viral
3. Cerebral palsy
4. Hydrocephalus
5. Microcephaly
6. Space occupying lesion

May Know

1. Muscular dystrophy
2. Neural tube defects
3. Mental retardation



4. AFP / GBS

Desirable to Know

1. Paraplegia
2. Hemiplegia
3. Spinal Muscular atrophy
4. Neuro degenerative disorders

**RENAL**

Must Know

1. AGN
2. Nephrotic Syndrome
3. UTI
4. Posterior urethral valve
5. Hydronephrosis

May Know

1. ARF
2. Hematuria
3. Renal calculi

Desirable to Know

1. Wilm's tumour
2. Polycystic kidney
3. Renal transplant
4. CRF
5. Dialysis

**HEMATOLOGY**

Must Know

1. Iron deficiency anemia
2. Haemolytic Anemia
3. ITP
4. Coagulation disorders
5. Stem cell transplant
6. Peripheral smear

May Know

1. Transfusions
2. DIVC
3. Febrile Neutropenia

Desirable to Know

1. Myeloproliferative disorders
2. Aplastic anemia (Fanconi's anemia)

## ONCOLOGY

### Must Know

1. ALL
2. Wilm's tumor
3. Hodgkin Lymphoma
4. NHL

### May Know

1. Retinoblastoma
2. Hepatoblastoma
3. Neuroblastoma
4. Hemangioma
5. Osteosarcoma

### Desirable to Know

1. Pheochromocytoma
2. Craniopharyngioma

## INFECTION

### Must Know

1. Enteric fever
2. Malaria
3. Typhus
4. Measles
5. Chicken pox
6. Strepto, Staph, Pneumo coccus
7. H.influenza
8. Candidiasis, Tinea
9. Dengue
10. HIV
11. TB
12. Scabies
13. Ankylostomiasis
14. Amoebiasis
15. Giardiasis
16. Poliomyelitis
17. Rotavirus
18. E.coli infection

### May Know

1. Influenza viruses
2. Japanese Encephalitis
3. Mumps
4. Whooping cough
5. Campylobacter jejuni
6. Klebsiella
7. Nosocomial infection

## 8. Hepatitis

### Desirable to Know

1. MRSA
2. Leprosy
3. Aspergillosis
4. Chikungunya
5. Ebola virus

## **IMMUNIZATION**

### Must Know

1. National immunization programmes
2. Vaccines and Vaccine – Preventable diseases
3. Principles of immunization
4. Vaccine preservation and cold chain
5. Indications, contra indications, adverse reaction and complications
6. Investigations and reporting of Vaccine preventable diseases

### May Know

1. Newer vaccines – Haemophilus, Pneumococcal, Hepatitis – A
2. Meningococcal, Acellular Pertussis, Injectable Polio, Influenza vaccine
3. Varicella, Rotavirus Vaccine

## **ENDOCRINE**

### Must Know

1. Hypothyroidism
2. Goitre
3. Addison's
4. Cushing's
5. Congenital adrenal hyperplasia
6. Short stature
7. Diabetes & related problems
8. SMR

### May Know

1. Gynecomastia
2. Hyperparathyroidism
3. Hyperthyroidism
4. H deficiency

### Desirable to Know

1. Precocious puberty delayed puberty
2. Hormone therapy

## NUTRITION

### Must Know

1. Severe Acute Malnutrition
2. Anthropometry
3. Obesity
4. Vitamin and mineral deficiencies (A, D, K, Iron, Zinc, Calcium, Iodine)
5. Normal Protein & caloric values of food

### May Know

1. Other vitamin Micronutrient deficiency
2. Hyper vitaminosis
3. Net protein utilization
4. Biological value

### Desirable to Know

1. Selenium Deficiency
2. Trace element Deficiency

## NEWBORN

### Must Know

1. Definition of AGA, SGA, LGA term & Preterm, Post term
2. APGAR score
3. Resuscitation
4. Neonatal Jaundice
5. Thermo regulation
6. Neonatal sepsis
7. MAS & hyaline membrane disease
8. Breast feeding
9. Primitive neonatal reflexes
10. Imperforate anus and surgical Emergencies
11. Normal in Newborn
12. Neonatal convulsion
13. HIE
14. Caput, birth injuries
15. Infant of diabetic mother
16. Hypoglycemia
17. Diaphragmatic hernia
18. Oesophageal atresia / TEF
19. Kangaroo Mother care

### May Know

1. VKDB – vit-K deficiency of newborn
2. NEC
3. Stridor
4. PDA in newborn

5. Congenital anomalies
6. TORCH infection
7. PUV
8. Exchange transfusion

Desirable to Know

1. Ventilators
2. Warmer
3. Phototherapy
4. Surfactant Therapy
5. Cong. Hydrocele

## **GENETIC**

Must Know

1. Down syndrome
2. Gene therapy
3. Karyotyping
4. Genetic counseling

May Know

1. Turner syndrome

Desirable to Know

1. Klinefelter Syndrome

## **MUSCULO SKELETAL**

Must Know

1. Rickets
2. Osteo myelitis
3. Septic arthritis
4. Osteogenesis imperfect

May Know

1. Muscular dystrophies
2. Mucopolysaccharidosis
3. Rheumatoid arthritis

## **INTEGRATED TEACHING**

1. Diabetes in children
2. Protein energy Malnutrition
3. Tropical infections and infestations
4. Diarrheal disorders
5. Psychological and behavioral disorders in children
6. Adolescent Paediatrics
7. Common childhood and neonatal surgical problems
8. Congenital Heart Disease: Cyanotic and Acyanotic

**UNIVERSITY EXAMINATION PATTERN**  
**M.B.B.S. DEGREE EXAMINATION**  
**FINAL YEAR MBBS**  
**PAEDIATRICS**

**Time: 3 hrs**

**Max Marks: 80**

**Answer all questions**  
**Illustrate the answer with suitable diagrams**

**PART - A**

**I. Multiple Choice questions (20x1=20 marks) (1-20)**

Must Know - (15)

May Know - (5)

**PART - B**

**I. Essay Questions (1x10=10 marks)**

1. (Must Know)

**II Write short notes (4x5=20 marks)**

1. (Must Know)

2. (May Know)

3. (May Know)

4. (Desirable to know)

**PART - C**

**I. Essay Questions (1x10=10 marks)**

1. (Must Know)

**II Write short notes (4x5=20 marks)**

1. (Must Know)

2. (May Know)

3. (May Know)

4. (Desirable to know)

**Model Question Paper**  
**M.B.B.S Degree Examination**  
**Final Year MBBS**  
**MBS15407 Paediatrics**

Time: Three hours

Max. Marks: 80

Part A – Twenty minutes

Part A – 20 marks

Part B & Part C – Two hours forty minutes

Part B & Part C – 60 marks

Use **OMR coding sheets** for answering **Part – A**  
Use **separate Answer Books** for **Part – B and Part – C**

**Part – A: MCQ – 20 questions**

**(20x 01= 20 marks)**

**PART - B**

**I. Essay**

**(1x10=10)**

1. Discuss the etiology, pathogenesis, clinical features, Investigations and treatment of Rheumatic Heart Disease? **(Must Know)**

**II. Short notes**

**(4x5=20)**

1. Acute Laryngotracheo bronchitis (ALTB) **(Must Know)**
2. Infective endocarditis **(May Know)**
3. Hirschprung Disease **(May Know)**
4. Wilms Tumour **(Desirable to Know)**

**PART - C**

**I. Essay**

**(1x10=10)**

1. Define Meningitis and discuss the etiology, clinical features and management of Pyogenic Meningitis **(Must Know)**

**II. Short notes**

**(4x5=20)**

1. Urinary tract Infection in children **(Must Know)**
2. Pulmonary function test **(May Know)**
3. Hypertrophic pyloric stenosis **(May Know)**
4. Precocious Puberty **(Desirable to Know)**

**PART - A**  
**MULTIPLE CHOICE QUESTIONS**

**MCQ's**

**20x1=20**

1. Complication of preterm baby includes the following except **(Must Know)**  
a) NNEC,                      b) Jaundice,  
c) ROP,                        d) Iron overload
2. Bells Palsy is paralysis of **(Must Know)**  
a) 8<sup>th</sup> cranial nerve,      b) 2<sup>nd</sup> cranial nerve,  
c) 9<sup>th</sup> cranial nerve,      d) 7<sup>th</sup> cranial nerve
3. Treatment of severe dehydration is **(Must Know)**  
a) Mannitol,                b) Ringers lactate,  
c) Dextrose,                d) Isolyte P
4. Earliest manifestation of Vitamin A deficiency is **(Must Know)**  
a) Night blindness,      b) Loss of colour vision,  
c) Squint,                    d) Nystagmus
5. Child is dry by day by the age of **(Must Know)**  
a) 1 year,                    b) 2 years,  
c) 3 years,                    d) 5years
6. In Jones criteria, which of the following is not a major criteria **(Must Know)**  
a) Carditis,                b) Clubbing,  
c) Arthritis,                d) Erythema marginatum
7. Normal body temp in newborn is **(Must Know)**  
a) 30 – 32 C                b) 36.5 to 37.5 C  
c) 32-34 C                    d) 40 – 42 C
8. Suck – swallow breathing coordination occur by **(Must Know)**  
a) 28 week                b) 30 week  
c) 34 week                d) 32 weeks
9. Average length of newborn at birth is **(Must Know)**  
a) About 30 cm            b) 40 cm  
c) 60 cm                    d) 50 cm
10. The chromosomal constitution in turner syndrome is **(May Know)**  
a) 46 x                      b) 47 xxy  
c) 45 x                        d) trisomy 21



11. Umbilical cord usually fall by **(Must Know)**  
a) 2<sup>nd</sup> day                      b) 3<sup>rd</sup> day  
c) 7<sup>th</sup> day                        d) Immediately after birth
12. All are included in Apgar scoring except **(Must Know)**  
a) Colour                        b) Tone  
c) Heart rate                    d) Respiratory rate
13. Hyaline membrane disease in more common in **(Must Know)**  
a) Preterm                      b) Term  
c) Post term                    d) IUGR
14. Most common type of leukemia in children is **(May Know)**  
a) ALL                            b) AML  
c) CML                           d) CLL
15. Continuous murmur is seen in **(Must Know)**  
a) ASD,                        b) VSD,  
c) PDA,                        d) Endocardial cushion defect
16. Most common cause for Viral hepatitis in children **(Must Know)**  
a) Hepatitis A virus,    b) Hepatitis B virus,  
c) Hepatitis C virus,    d) Hepatitis D virus
17. Most common abdominal mass in a neonate **(May Know)**  
a) Wilm's                        b) Neuroblastoma  
c) Multicystic dysplastic kidney d) Undesended testis
18. Sun setting sign is seen in **(May Know)**  
a) Microcephaly,            b) Spina Bifida,  
c) Hydrocephalus,        d) Trigonocephaly
19. Hand Foot mouth disease is caused by **(May Know)**  
a) Virus,                        b) Bacteria,  
c) Protozoa,                    d) Fungus
20. The test used to detect developmental dysplasia of hip is **(Must Know)**  
a) Barlow                        b) Moro's  
c) Kernings                     d) String

## BOOKS RECOMMENDED

1. Essential Paediatrics, by O.P.Ghai, 8<sup>th</sup> Edition, CBS, 2013.
2. IAP Textbook of Paediatrics, by Parthasarathy, 5<sup>th</sup> Edition, Jaypee, 2013.
3. Short Textbook of Paediatrics, by Suraj Gupte, 11<sup>th</sup> Edition, Jaypee, 2008.
4. Textbook of Paediatrics by Udani. 3 vol, Jay pee, 1998.
5. Clinical Methods in Paediatrics, by Meharban Singh, 4<sup>th</sup> Edition, Sagar, 2015.
6. Clinical Examination by Tally. 7<sup>th</sup> Edition, Elsevier, 2013.

## REFERENCE BOOKS

1. Textbook of Paediatrics, by Nelson, 19<sup>th</sup> Edition, Elsevier, 2012.
2. Forfar & Arneils Text book of Paediatrics, by Mcintosh,Neli, 7<sup>th</sup> Edition, Churchill Livingstone, 2008.
3. Manual of Neonatal care, by Meharbahn Singh.
4. Nutrition and Child Development, by Elizabeth, 5<sup>th</sup> Edition, Paras Publications, 2015.
5. Textbook of Preventive and Social Medicine, by Park, 23<sup>rd</sup> Edition, Banarsides bhara, 2013.

## JOURNALS FOR REFERENCE

- Indian Paediatrics

*“What we want is to see the children in pursuit of knowledge,  
and not knowledge in pursuit of the child”*

- George Bernard Shaw

**SRM UNIVERSITY**  
**FACULTY OF MEDICINE**  
**BACHELOR OF MEDICINE AND BACHELOR OF SURGERY**  
**DISTRIBUTION OF MARKS WITH PASSING MINIMUM**

<b>IV - PROFESSIONAL YEAR</b>				
<b>(Clinical Subjects)</b>				
Subject code	Subject title	Evaluation parameter	Passing minimum	Maximum Marks
MBS15401 (paper-I)	General Medicine	Written (2 Papers)	120	240
		Written including oral	140	280
		Practical	100	200
		Internal Assessment (Theory-60;Practical-60)	42	120
		overall	300	600
MBS15402 (paper-II)	General Medicine	Written (2 Papers)	120	240
		Written including oral	140	280
		Practical	100	200
		Internal Assessment (Theory-60; Practical-60)	42	120
		overall	300	600
MBS15403 (paper-I)	General Surgery	Written (2 Papers)	120	240
		Written including oral	140	280
		Practical	100	200
		Internal Assessment (Theory-60; Practical-60)	42	120
		overall	300	600
MBS15404 (paper-II)	General Surgery	Written (2 Papers)	120	240
		Written including oral	140	280
		Practical	100	200
		Internal Assessment (Theory-60; Practical-60)	42	120
		overall	300	600
MBS15405 (paper-I)	Obstetrics and Gynaecology	Written (2 Papers)	80	160
		Written including oral	110	220
		Practical	50	100
		Internal Assessment (Theory-40; Practical-40)	28	80
		overall	200	400
MBS15406 (paper-II)	Obstetrics and Gynaecology	Written (2 Papers)	80	160
		Written including oral	110	220
		Practical	50	100
		Internal Assessment (Theory-40; Practical-40)	28	80
		overall	200	400
MBS15407	Pediatrics	Written (1 Paper)	40	80
		Written including oral	50	100
		Practical	30	60
		Internal Assessment (Theory-20; Practical-20)	14	40
		overall	100	200

**Marks qualifying for pass:**

50% in Theory  
50% in Practicals excluding viva voce & records  
35% in Internal Assessment  
50% in Total Aggregate

**Eligibility to appear for examination**

**Attendance = 75 percent**  
**Internal Assessment Marks = 35 percent**

## **SIMULATION BASED CURRICULUM FOR MBBS STUDENTS**

(Will be taken in the respective subject hours by the faculty concerned)

### **SYLLABUS FOR I YEAR MBBS STUDENTS ANATOMY**

**Duration 4 hours  
(Each class for 2 hours)**

**Classes – 2**

#### **Objective**

The students will be able to

1. Place a rescue airway (example LMA) and correlate applied anatomy of larynx
2. Understand principles of cannulating IJV (internal jugular vein), USG guided with applied anatomy of neck.
3. Correlate USG windows of Thoracic & abdominal viscera with thoracic & abdominal organs.

#### **CLASS 1**

Laryngeal rescue and airway

#### **CLASS 2**

1. Anatomy of neck veins and ultra sound guided CVP, correlate USG windows of Thoracic & abdominal viscera dissection.

## **SYLLABUS FOR I YEAR MBBS STUDENTS PHYSIOLOGY**

**Duration 4 hours  
(Each class for 2 hours)**

**Classes – 2**

### **Objectives**

The students will be able to

1. Interpret an ECG strip, normal and abnormal
2. Correlate cardiovascular physiology with clinical shock and hemodynamic monitoring.

### **CLASS 1**

ECG Cardiac rhythm and interpretation of normal and abnormal ECG

### **CLASS 2**

Correlate cardiovascular physiology with clinical shock and hemodynamic monitoring.

## **SYLLABUS FOR I YEAR MBBS STUDENTS BIOCHEMISTRY**

**Duration 4 hours  
(Each class for 2 hours)**

**Classes – 2**

### **Objectives**

The students will be able to

1. Diagnose and interpret ABG data and treat a simulation Patient with ABG disorder

### **CLASS 1**

Metabolic and respiratory acidosis

### **CLASS 2**

Metabolic and respiratory alkalosis

## **SYLLABUS FOR II YEAR MBBS STUDENTS MICROBIOLOGY**

**Duration 4 hours  
(Each class for 2 hours)**

**Classes – 2**

### **Objectives**

The students will be able to

1. correlate microbiology with septic shock
2. approach a patient in severe sepsis with EGDT protocol (early goal directed therapy)

CLASS 1

Septic shock

CLASS 2

EGDT early goal directed therapy

## **SYLLABUS FOR II YEAR MBBS STUDENTS PHARMACOLOGY**

**Duration 4 hours  
(Each class for 2 hours)**

**Classes – 2**

### **Objectives**

The students will be able to

1. Correlate cardiovascular pharmacology with inotrope support in a shock patient in critical setting.
2. correlate neuropharmacology with RSI (rapid sequence intubation)

CLASS 1

Cardiovascular pharmacology and inotrope support in shock patient in critical setting.

CLASS 2

Correlate neuropharmacology with RSI (rapid sequence intubation)

## **SYLLABUS FOR II YEAR MBBS STUDENTS FORENSIC MEDICINE**

**Duration 4 hours  
(Each class for 2 hours)**

**Classes – 2**

### **Objectives**

The student will be able to

1. posses cognitive knowledge in decontamination and management of insecticide poisoned patient admitted in critical care.
2. Posses cognitive knowledge in first aid and treatment of neurogenic and hemotoxic snake envenomation.
3. correlate assault with primary survey and management in trauma in ER.

#### **CLASS 1**

Correlate poisonings with first aid and management of insecticide-poisoned patients and snakebite victims in ER and ICU.

#### **CLASS 2**

Correlate assault with primary survey and management in trauma in ER.

## **SYLLABUS FOR II YEAR MBBS STUDENTS PATHOLOGY**

**Duration 4 hours  
(Each class for 2 hours)**

**Classes – 2**

### **Objectives**

The students will be able to

1. Correlate thyroid pathology with management of thyroid crisis in the ICU.
2. Correlate adrenal pathology with management of adrenal crisis in the ICU.

#### **CLASS 1**

Correlate thyroid pathology with management of thyroid crisis in the ICU.

#### **CLASS 2**

Correlate adrenal pathology with management of adrenal crisis in the ICU.

## **SYLLABUS FOR III YEAR MBBS STUDENTS COMMUNITY MEDICINE**

**Duration 4 hours  
(Each class for 2 hours)**

**Classes – 2**

### **Objectives**

The students will be able to

1. Prepare ORS (Oral rehydration solution) and manage a case of Dehydration
2. Manage a case of cardiac arrest in the community

### **CLASS 1**

Prepare ORS (Oral rehydration solution) and manage a case of Dehydration

### **CLASS 2**

Manage a case of cardiac arrest in the community

## **SYLLABUS FOR 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> SEMESTER FOR MBBS OG (II YEAR) STUDENTS**

**Duration 4 hours  
(Once in a week for six weeks)**

**Classes – 2**

### **Objectives**

1. Students will perform examination of the abdomen of the pregnant uterus and diagnose the period of gestational age, presenting part and position of the fetus.
2. Students will perform vaginal examination
  - a) In patients during labour (latent and active stage)
  - b) In normal patients (cervix and uterus)

### **SIMULATION BASED CURRICULUM**

1. Pervaginal examination
2. Conduct of normal labour



## SYLLABUS FOR 8<sup>TH</sup> AND 9<sup>TH</sup> SEMESTER FOR MBBS OG (IV YEAR) STUDENTS

Scenario based education of acute emergencies in obstetrics and gynecology.

**Duration 12 hours**  
**(Each class for 2 hours)**

**Classes – 6**

### **Objective of the course**

Students will be able to

1. Secure an IV line, able to do urethral catheterization diagnose a case of antepartum haemorrhage and to differentiate between placenta praevia and abruptio placenta will be able to anticipate a case of postpartum haemorrhage and treat
2. Recognize a case of hemoperitoneum
3. Diagnose a case of acute abdomen and differentiate pelvic causes.
4. Perform various obstetric maneuvers and mechanism of labour in LOA, ROP.
5. Conduct an assisted breech delivery, external cephalic version, shoulder dystocia
6. Recognize placental separation and its removal.
7. Perform the skills in instrument delivery (forceps)
8. Perform the steps of caesarean section
9. Perform the minor surgical skills (dilatation and curettage)

### **CLASS 1 - TWO HOURS**

1. IV line access and catheterization.
2. Ante partum haemorrhage / postpartum haemorrhage
  - Placenta praevia
  - Abruptio placenta

### **CLASS 2 - TWO HOURS**

1. Ectopic pregnancy
2. Torsion ovarian cyst

### **CLASS 3 - TWO HOURS**

1. Mechanism of labour
  - a. Occipito anterior (vertex presentation)
  - b. Occipito posterior – face to pubis delivery
  - c. Breech presentation
  - d. Assisted breech delivery

### **CLASS 4 - TWO HOURS**

1. External cephalic version]

2. Shoulder dystocia

**CLASS 5 - TWO HOURS**

1. Removal of placenta
2. Steps of caesarean section

**CLASS 6 - TWO HOURS**

1. Forceps delivery
2. Dilatation and curettage

**SYLLABUS FOR 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> SEMESTER FOR MBBS  
GENERAL MEDICINE (II Year) STUDENTS**

**Duration 4 Hours**

**Classes – 2**

**Objectives**

The students will be able to

1. record noninvasive blood pressure
2. give an intramuscular injection
3. possess appropriate communication skills
4. auscultation and interpret heart sounds, murmurs, lung sounds and adventitious sounds.

**CLASS 1**

1. Communication Skills
2. BP recording
3. Intramuscular injection

**CLASS 2**

1. Auscultation of heart sounds and breath sounds

**SYLLABUS FOR 8<sup>TH</sup> AND 9<sup>TH</sup> SEMESTER FOR MBBS  
GENERAL MEDICINE (IV Year) STUDENTS**

**Duration 4 Hours  
(Each class for 2 hours)**

**Classes – 2**

**Objectives**

The students will be able to

1. Identify different supraventricular and ventricular arrhythmias
2. Posses cognitive knowledge in basic life support and AED.

**CLASS 1**

1. Arrhythmias

**CLASS 2**

2. Basic life support
  - a) Assessing unresponsiveness and accessing emergency medical response.
  - b) Basic airway management including use of airway adjuncts, barrier devices, assessing and managing cardio pulmonary arrest.
  - c) Proficiency in single rescue CPR (Cardio pulmonary Resuscitation) and two persons rescue CPR.
  - d) Management of respiratory arrest.
  - e) Management of airway obstruction.
  - f) Operating AED (Automated Electric Defibrillator)

**SYLLABUS FOR 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>TH</sup> SEMESTER FOR MBBS  
GENERAL SURGERY AND ORTHOPAEDICS (II YEAR)  
STUDENTS**

**Duration 4 hours  
(Each class for 2 hours)**

**Classes – 2**

**Objective of the course**

The student will be able to

1. pass nasogastric tube
2. perform perrectal examination
3. perform breast examination
4. catheterize male and female urethra
5. cannulate peripheral veins and perform cut down
6. give intramuscular injections.

**CLASS 1**

1. Nasogastric Tube
2. Perrectal examination
3. Breast examination

**CLASS 2 –**

1. Urethral catheterization (Male and female)
2. IV cannulation and IV cut down
3. Intramuscular injections

## SYLLABUS FOR 8<sup>TH</sup> AND 9<sup>TH</sup> SEMESTER FOR MBBS GENERAL SURGERY AND ORTHOPAEDICS (IV YEAR) STUDENTS

**Duration 4 hours**  
**(Each class for 2 hours)**

**Classes – 2**

### **Objective of the course**

The students will be able to

1. perform suturing
2. perform debridement
3. perform secondary suturing
4. apply cervical collar.
5. apply pelvic binder
6. do basic extremity splinting
7. position patient and strap to a spine board.
8. Perform a log roll.

### CLASS 1 .1 – Management of acute wounds

- a. Suturing
- b. Debridement
- c. Secondary suturing etc.

### CLASS 2.1 – Immobilization

- a. Cervical collar
- b. Pelvic binder
- c. Basic extremity splinting
- d. Spine board
- e. Log roll

**SYLLABUS FOR 8<sup>TH</sup> AND 9<sup>TH</sup> SEMESTER FOR MBBS  
PAEDIATRICS (IV YEAR) STUDENTS**

**Duration 4 hours  
(Each class for 2 hours)**

**Classes – 2**

**Objective of the course**

The students will be able to

1. Possess neonatal life support cognitive knowledge.
2. Paediatric life support cognitive knowledge.

**CLASS 1**

1. Neonatal life support

**CLASS 2**

2. Paediatric life support

**MEDICAL SCHOOL FINISHING PROGRAM**

FOR CRRIs, before starting internship to have finishing school program for 5 days.(University may advance announcement of result of the final MBBS to accommodate this training in the interval between the announcement of results and commencement of CRRi )

**MEDICAL SCHOOL FINISHING PROGRAM**

Duration 5 Days Classes – 10 (10 Classes in 5 days two classes; each classes for 2 hours) (Total Hours – 20 Hours)

**OBJECTIVES**

1. To have overview of the CRRi training.
2. To enable them to work as a team in co-ordination with paramedics.
3. To enable them to maintain various records (case sheet writing, investigation chart, discharge summary, maintaining interesting case registers and writing prescriptions.)
4. To teach them in maintaining the patient's confidentiality regarding diagnosis and treatment.
5. Care of the trauma patients.
6. Make them proficient in communication skills (with patients and patient's attenders; breaking bad news) reporting about the case to consultant.

#### DAY 1

1. Over View
2. Patient Doctor Interaction.

#### DAY 2

1. Role-play method of learning.
2. Promote teamwork.

#### DAY 3

1. Record keeping.
2. Patient confidentiality

#### DAY 4

1. Work program introduction.
2. Transporting and caring trauma patient.

#### Day 5

1. Communication skill and breaking bad news.
2. Receiving a patient and transferring the patient.

### **SYLLABUS FOR BLS (BASIC LIFE SUPPORT) for Final Years (Already approved in July 20 th Academic Council meeting (21.07.2012)**

#### Assessing unresponsiveness and Activating Emergency Medical Response

1. Basic airway management including use of airway adjuncts, barrier devices
2. Assessing and managing cardiopulmonary arrest
3. Proficiency in single-rescuer CPR (Cardiopulmonary Resuscitation) and two-rescuer CPR
4. Management of respiratory arrest
5. Management of airway obstruction
6. Operating AED (automatic electric defibrillator)

### **SYLLABUS FOR ACLS (ADVANCED CARDIAC LIFESUPPORT)**

1. Use of conventional defibrillator/monitor for defibrillation and cardioversion
2. Use of transcutaneous pacing devices
3. Recognition of cardiac arrest and periarrest rhythms
4. Critical assessment and management following Core Cases:
  - i. VF/VT (Ventricular fibrillation, Ventricular tachycardia)
  - ii. PEA (Pulseless electrical activity)
  - iii. A systole
  - iv. Unstable tachycardia
  - v. Unstable bradycardia
5. Implementing ACLS algorithms in managing the Core Cases
6. Adult CPR skills and use of AED
7. Working with good Team Dynamics (using Simulation-based Role Play Method of Learning & Debriefing)

## **SYLLABUS FOR CLINICAL TOXICOLOGY**

1. Principles and deployment of adequate decontamination measures
2. Assess and manage the 4 common groups of Poisoning as enumerated by WHO (World Health Organization)
  - i. Insecticide poisoning
  - ii. Plant and animal poisoning
  - iii. Chemicals poisoning
  - iv. Pharmaceutical poisoning
3. Simulation-based resuscitation of poisoned patients; incorporating Role Play Method and Debriefing

## **SYLLABUS FOR BASIC AIRWAY MANAGEMENT**

1. Understanding Indications for basic airway management, including airway maintenance and airway protection
2. Use of airway adjuncts
3. Use of rescue airway (LMA - Laryngeal mask airway)
4. Endotracheal intubation and confirmation of airway placement
5. RSI (Rapid sequence intubation)
6. Deploying drugs used in RSI

### Reference

1. MEDICAL COUNCIL OF INDIA:  
[http://www.mciindia.org/tools/announcement/MCI\\_booklet](http://www.mciindia.org/tools/announcement/MCI_booklet) Introduction of new teaching methods and adoption of contemporary educational technologies including skills lab, E-learning and Simulation
2. Alexander et al Simulation based trial of surgical crisis Checklists. NEJM 2013,368;3 dt June 17,2013
3. Berwick D Reducing errors in Medicine; it is time to take this more seriously. BMJ.1999 319 (7203): pp 136-137
4. Ericsson KA, Deliberate practice and Acquisition and maintenance of Expert Performance in Medicine and related Domains. Acad Med.2004 Oct;79 (10 Suppl): s70-81
5. Issenberg et al. Features and uses of high Fidelity medical Simulations that lead to effective Learning: a BEME systematic Review. Med Teach.2005 Jan;27 (1): 10-28
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8. SSH (International) Society for simulation in Health care  
<http://ssih.org/about-simulation>



**DISASTER MANAGEMENT SYLLABUS FOR UG LEVEL**  
**(Will be taken in the respective subject hours by the faculty concerned)**

**(Optional)**

Course Details

The course will be of 35 lectures of about 45 minutes each-following the UGC pattern. It will be taught in a single semester. It may be located in any of the 3 years of graduation based on availability of teachers and structure of the broader courses on offer in each University/College. The course may be taught by a teacher of any discipline as Disaster Management (DM) is multi disciplinary and draws its knowledge base from a range of disciplines.

Objectives of the Course

1. To provide basic conceptual understanding of disasters and its relationships with development.
2. To gain understand approaches of Disaster Risk Reduction (DRR) and the relationship between vulnerability, disasters, disaster prevention and risk reduction.
3. To understand Medical and Psycho-Social Response to Disasters.
4. To prevent and control Public Health consequences of Disasters
5. To enhance awareness of Disaster Risk Management institutional processes in India
6. To build skills to respond to disasters. Total units = 5

Total lectures = 35 (45 minutes each)

## **UNIT-1: INTRODUCTION TO DISASTER.**

(3 Lectures)

AIM

The overall aim of this is to provide broad understanding about the basic concepts of Disaster Management

Objectives.

1. To Understand basic concepts in Disaster Management
2. To Understand Definitions and Terminologies used in Disaster Management
3. To Understand Types and Categories of Disasters
4. To Understand the Challenges posed by Disasters
5. To understand Impacts of Disasters

Key Skills and Competencies developed

1. Application of Disaster Concepts to Management
2. Analyze Relationship between Development and Disasters.
3. Ability to Categories Disasters

### **Contents**

Concepts of Hazard, Vulnerability, Risks, Natural Disasters (earthquake, Cyclone, Floods, Volcanoes), and Man Made Disaster ( Armed conflicts and civil strip, Technological disasters, Human Settlement, Slow Disasters (famine, draught, epidemics) and Rapid Onset Disasters(Air Crash, tidal waves, Tsunami) Risks, Difference between Accidents and Disasters, Simple and Complex Disasters, Refugee problems, Political, Social, Economic impacts of Disasters, Gender and Social issues during disasters, principles of psychosocial issues and recovery during emergency situations, Equity issues in disasters, Relationship between Disasters and Development and vulnerabilities, different stake holders in Disaster Relief. Refugee operations during disasters, Human Resettlement and Rehabilitation issues during and after disasters, Inter-sectoral coordination during disasters, Models in Disasters.

## **UNIT-II: APPROACHES TO DISASTER RISK REDUCTION**

(8 Lectures)

Aim

The aim of Approaches to Disaster Risk Reduction is to enhance the knowledge by providing existing models in risk reduction strategies to prevent major casualties during disaster.

Objectives

1. To promote Prevention and Preparedness for disaster
2. To undertake Mitigation & Risk Reduction steps
3. To prioritize Rescue and Relief operation
4. To understand Rehabilitation & Reconstruction

Key Skills/Competencies developed

1. Preparedness plans for disaster response.
2. Monitoring and evaluation plan for disaster response
3. Setting up of early warning systems for risk reductions

**Contents**

Disaster Risk Reduction Strategies, Disaster Cycle, Phases of Disaster, Preparedness Plans, Action Plans and Procedures, Early warning Systems Models in disaster preparedness, Components of Disaster Relief-(Water, food, sanitation, shelter, Health and Waste Management), Community based DRR, Structural non structural measures in DRR, Factors affecting Vulnerabilities, , Mainstreaming disaster risk reduction in development, Undertaking risk and vulnerability assessments, Policies for Disaster Preparedness Programs, Preparedness Planning, Roles and Responsibilities, Public Awareness and Warnings, Conducting a participatory capacity and vulnerability analysis, , Sustainable Management, Survey of Activities Before Disasters Strike, Survey of Activities During Disasters, DRR Master Planning for the Future, Capacity Building, Sphere Standards. Rehabilitation measures and long term reconstruction.Psychosocial care provision during the different phases of disaster.

## UNIT- III: PRINCIPLES OF DISASTER MEDICAL

### MANAGEMENT

(8 Lectures)

#### Aim

To develop awareness among students in the disaster medicine and make them understand and be prepared for natural and man made disaster induced medical problems and its related consequences.

#### Objectives:

1. To induce knowledge to create appropriate planning, preparation and response for emergency treatment in disaster situation.
2. To implement disaster drills and provide opportunities for all medical care givers to participate in disastrous situation.
3. To learn efficient emergency skills for providing health care to disaster survivors.
4. To provide insight, guidance and expertise on the principles and practice of medicine both in the disaster impact areas ( Pre hospital care ) health evacuation receiving facilities like hospitals.
5. To provide the requirements
6. set by NIMS(National Incident Management System) implementation plan for hospitals and health care facilities.
7. To provide the knowledge about medical triage and psychosocial triage.

#### Key Skills/Competencies developed

1. Emergency First Aid at Disaster Site.
2. Emergency Medical Triage
3. Patient transport and logistic management
4. Medical/Hospital contingency planning

#### Content

Introduction to disaster medicine, Various definitions in disaster medicine, Disaster life cycle, Disaster planning, Disaster preparation, Disaster recovery in relation to disaster medical management, Medical surge, Surge capacity, Medical triage, National Assessing the nature of hazardous material - Types of injuries caused, Self protection contaminated area and decontaminated area – Pre hospital medical management of victims

– Triage medical & psychosocial identification of hospitals and other medical facilities to offer efficient disastrous medical service – Safe patient transportation – Identification of valuable groups (Pregnancy, pediatric and geriatric other people

with associated medical co morbidities) (DM, Systemic Hypertension / Cardiac, Pulmonary, Cerebral and Renal) – knowledge about antidotes, - and Body decontaminations procedures (skin, GI tract, Respiratory tract and from blood) – Poly trauma Care - Specific treatment in emergency and Intensive Care Units – allocation of specialists in Local EMS System including equipments, safe use of equipments.

#### **UNIT-IV: PUBLIC HEALTH RESPONSE AND INTERNATIONAL COOPERATION**

(8 Lectures)

Aim

The aim public health management of disaster is to build capacities that will reduce disaster health risks and contribute to public health based relief following disasters thereby reducing morbidity and mortality following disasters.

Objectives

1. To build capacities for Outbreak investigating disease epidemics during and after disaster
2. Global Pandemic control
3. To plan Disease surveillance system for emergency situations.
4. To Prevent environmental health Problems
5. To understand International Health Regulation
6. To Improve international cooperation by identification of International Agencies in Disasters Management

Key Skills& Competencies developed

1. Skills in Outbreak Investigation
2. Skills in surveillance system for emergency situations.
3. Application of Hyogo frame work,
4. Application of International Health Regulation

#### **Contents**

Principles of Disaster Epidemiology, Rapid Health Assessment, Rapid Health needs assessment. Outbreak Investigation Environment health hygiene and sanitation issues during disasters, Preventive and prophylactic measures including Measles immunization, ORS, water, supply, chemoprophylaxis, food fortification, food supplements, MISP-Reproductive Health Care, International cooperation in funding on public health during disaster, To identify existing and potential public health problems before, during and after disasters. (168 countries Framework Disaster Risk Reduction), International Health Regulation, United Nation International Strategy for Disaster Risk Reduction (UNISDR), United Nation Disaster Management Team, International Search and Rescue Advisory Group, (INSARAG, Global Facility for Disaster Risk Reduction (GFDRR), Asean Region Forum (ARF), Asian disaster Reduction Centre (ADRC), SAARC

## **UNIT-V: DISASTER RISK MANAGEMENT IN INDIA**

(8 Lectures)

Aim:

The aim of the session is to create awareness among participants on Disaster Management Scenario in India

Objectives:

1. Evolution of Disaster Management in India
2. To understand the institutional and legal framework for India
3. Policy and Programmers for Disaster In India
4. Roles and Responsibilities of Panchayat, urban and Local bodies in Disaster Management
5. Indian Case Studies

Contents:

Hazard and Vulnerability Profile India,, Disaster Management Indian scenario, India's vulnerability profile, Disaster Management Act 2005 and Policy guidelines, National Institute of Disaster Management, , National Disaster Response Force (NDRF)National Disaster Management Authority, States Disaster Management Authority, District Disaster Management Authority Cases Studies : Bhopal Gas Disaster, Gujarat Earth Quake, Orissa Super-cyclone, south India Tsunami, Bihar floods, Plague-Surat, Landslide in North East, Heat waves of AP& Orissa,Cold waves in UP. Bengal famine, best practices in disaster management, Local Knowledge Appropriate Technology and local Responses, Indigenous Knowledge, Development projects in India (dams, SEZ) and their impacts, Logistics management in specific emergency situation. Rajiv Gandhi Rehabilitation package, Integrated Coastal Zone Management, National Flood Risk Mitigation Project (NFRMP), Mines Safety in India, Indian Meteorological Department, National Crisis Management Committee, Indian NATIONAL Centre for Oceanic Information System (INCOIS)

Key Skills & Competencies developed

1. Application of Sphere Standards Indian context
2. Interpretation of laws disaster management act in India
3. Acquainting with Disaster Response command system in respective states.
4. Application of Best Practices from Case scenario Studies in India.

### **PROJECT WORK**

Project Work: (Field Work, Case Studies)

The project /fieldwork is meant for students to understand vulnerabilities and to work on reducing disaster risks and to build a culture of safety. Projects are

conceived creatively based on the geographic location and hazard profile of given region

A few ideas or suggestions on topics for projects for Student work could be as follows.

1. Development Disaster preparedness plans
2. Monitoring and evaluation plan for disaster response
3. Low cost Home based water purification methods
4. Planning Nutrition intervention programmes
5. IEC Activities on public health issues during disasters
6. Preparedness plans for public health response.
  
7. Safety tips before during and after earthquake, cyclone, floods and fire accidents.
8. Mapping Disaster prone areas,
9. Mapping vulnerability of people (specific groups) and resources.
10. Mock Drills
11. First Aid Training
12. World's deadliest disasters
13. Major disasters in India
14. Disaster Management in India
15. Disasters in India – An overview Institutional Framework
16. Flood affected areas and damages in India
17. Tropical cyclones
18. Heat waves in India
19. Earth quakes in India
20. Industrial and Chemical Disasters
21. Hands vide hazard zones in India
22. Historical Tsunamis in India
23. Nuclear emergence
24. Major stampedes in India
25. Local Traffic accidents in India
26. Train Accidents
27. Mine disasters
28. Major disease outbreak
29. Disaster management structure in India
30. Precaution, mitigation of disaster in India
31. Warning system in India to prevent disaster
32. Bhopal gas tragedy
33. Kutch earth quake
34. Tsunami (2004)
35. Kosi Calamity 2008
36. Mayapuri radiation exposure Delhi (2010)
37. Mock excuses
38. First aid
39. Strengthening the preparedness phase – the way forward

## Teaching Resources

Emphasis will be on interactive teaching learning methods. Tools could be Range of Films- documentaries and feature films related to disasters and their impacts and on vulnerabilities of people are available which a teacher could choose with care and screen. This could form a basis for classroom discussion.

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5. Sphere Project (2011). Humanitarian Charter and Minimum Standards in Disaster Response.
6. Geneva: Sphere Project. <http://www.sphereproject.org/> handbook/
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8. Prewitt Diaz, J.O (2004). The cycle of disasters: from Disaster Mental Health to Psychosocial Care. Disaster Mental Health in India, Eds: Prewitt Diaz, Murthy, Lakshmi Narayanan, Indian Red Cross Society Publication.
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10. Inter Agency Standing Committee (IASC) (Feb. 2007). IASC Guidelines on Mental Health and Psychosocial Support in Emergency Settings. Geneva: IASC.
11. Alexander David, 2000 Introduction in 'Confronting Catastrophe', Oxford University Press.
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13. Blaikie, P, Cannon T, Davis I, Wisner B 1997. At Risk Natural Hazards, Peoples' Vulnerability and Disasters, Routledge.
14. Coppola P Damon, 2007. Introduction to International Disaster Management, Carter, Nick 1991. Disaster Management: A Disaster Manager's Handbook. Asian Development Bank, Manil



## INSTRUCTIONS TO THE INTERNEE

1. All parts of internship shall be done as per the rules framed by the Medical Council of India.
2. All interns shall carry internship diary with them every day and get it signed by the concerned authority.
3. Interns must learn various activities as mentioned in the work.
4. Interns must carry stethoscope, overcoat and other basics required during their posting.
5. Interns must be accessible anytime in order to handle emergency if it arises.
6. Interns should take initiative, participate in discussion and develop research aptitude.
7. Only one casual leave (C.L.) with prior written permission of HOU/HOD per month of posting in the respective department will be permissible.
8. Minimum of 80% presence in each posting separately is mandatory.
9. In case the presence in each posting is less than 80% and / or assessment score is less than 3 in respective posting, the concerned posting will have to be repeated without stipend.

## GENERAL GUIDELINES TO INTERNS

### GENERAL

Internship is a phase of training where in a graduate is expected to conduct actual practice of medical & health care and acquire skills under supervision. So that he/she may become capable of functioning independently.

#### 1. SPECIFIC OBJECTIVES

At the end of the internship training, the student shall be able to:

1. Diagnose clinically common disease conditions, encountered in practice make timely decision for referral to higher level.
2. Use discretely the essential drugs, infusions, blood or its substitutes & laboratory services.
3. Manage all type of emergencies – medical, surgical, obstetric, neonatal and paediatric, by rendering first level care.
4. Demonstrate skills in monitoring of the National Health Programme and promotive health care services to the community.
5. Develop leadership qualities to the function effectively as a leader of the health team organized to deliver the health care family welfare services in the existing socio – economic, political and cultural environment.
6. Render services to chronically sick and disabled (both physical & mental) and to communicate effectively with patient and the community.

#### 2. TIME ALLOCATION

The allocation to each discipline is approximate and shall be guided more specifically by the actual experience obtained. Responsible authorities from the Medical College shall adjust the intern's experience to maximize the intern's opportunities to practice skills inpatient care in rough approximation of the time allocation suggested.

### 3. INTERNSHIP – TIME DISTRIBUTION-

#### **COMPULSORY –**

<b>S.NO</b>	<b>SUBJECTS</b>	<b>DURATION</b>
1	Community Medicine	2 Months
2	General medicine including 15 days of Psychiatry	2 Months
3	General Surgery including 15 Days of Anaesthesia	2 Months
4	Obst./Gynae.( Inc.FWP)	2 Months
5	Paediatrics	1 Month
6	Orthopaedics including PMR	1 Month
7	ENT	15 Days
8	Ophthalmology	15 Days
9	Casualty	15 Days
10	Elective	15 Days

#### ***Elective subjects:-***

Subjects for elective posting will be as follows:

- 1) Dermatology and Sexually Transmitted Diseases
- 2) Tuberculosis and respiratory Diseases
- 3) Radio – diagnosis
- 4) Forensic Medicine
- 5) Blood bank
- 6) Psychiatry

#### **4. ASSESSMENT OF INTERNSHIP:**

a) The intern shall maintain a record of work in the form of a log book, which is to be verified and certified by the medical officer under whom he works. This shall cover all aspects including the essential skills covering all Taxonomic Domains, Ethical skills and Communication skills that would have to be learned during internship training. An assessment and grading of these skills would be made by the concerned authorities in each department periodically. Performance of the skills should be thought, supervised and certified by a member of teaching staff. Apart from scrutiny of the record of work, assessment and evaluation of training shall be undertaken by an objective approach using situation tests in knowledge, skills and attitude during and at the end of training

Based on record of work and date of evaluation, the Dean shall issue certificate of satisfactory completion of training, following which the university shall award the M.B.B.S. degree or declare him eligible for it.

b) Satisfactory completion shall be determined on the basis of the following score ranging from 0 to 5.

0 – Poor, 1 – Average, 2 – Above Average, 3 – Good, 4 – Very Good and 5-Excellent

- Proficiency of knowledge required for each case.
- The competency in skills expected to manage each case: namely
  - i. competency for performance of self performance,
  - ii. of having assisted in procedures.
- Responsibility, punctuality, work up of case, involvement in treatment, follow-up reports.
- Capacity in work in a team (behavior with colleagues, nursing staff and relationship with paramedical).
- Initiative, participation in discussions, research aptitude.

A score of less than 3 in any of the above items will represent unsatisfactory completion of internship.

## **5. INTERNSHIP – DISCIPLINE RELATED:**

Some guidelines in the implementation of the training programme are given below.

### **(i) Community Medicine**

Interns shall acquire skills to deal effectively with an individual and the community in the context of primary health care. This is to be achieved by hands on experience in the district hospital and primary health Centre. The details are as under: -

#### **(I) Community Health Centre/District Hospital/Attachment to General Practitioner:**

- (1) During this period of internship an intern must acquire
  - (a) clinical competence for diagnosis of common ailments, use of bed side investigation and primary care techniques;
  - (b) gain information on 'Essential drugs' and their usage;
  - (c) Recognise medical emergencies, resuscitate and institute initial treatment and refer to suitable institution.
- (2) Undergo specific Government of India/Ministry of Health and Family Welfare

approved training using Government of India prescribed training manual for Medical Officers in all National Health Programmes (e.g. child survival and safe motherhood-EPI, CDD, ARI, FP, ANC, safe delivery, Tuberculosis, Leprosy and others as recommended by Ministry of Health and Family Welfare:-

- (a) gain full expertise in immunization against infectious disease;
- (b) participate in programmes in prevention and control of locally prevalent endemic diseases including nutritional disorders;
- (c) learn skills first hand in family welfare planning procedures;
- (d) learn the management of National Health Programmes;

(3) Be capable of conducting a survey and employ its findings as a measure towards arriving at a community diagnosis.

(4) (a) conduct programmes on health education,

(b) gain capabilities to use Audiovisual aids,

(c) acquire capability of utilization of scientific information for promotion of community health

(5) Be capable of establishing linkages with other agencies as water supply, food distribution and other environmental/social agencies.

(6) Acquire quality of being professional with dedication, resourcefulness and leadership.

(7) Acquire managerial skills, delegation of duties to paramedical staff and other health professionals.

(II) Besides clinical skill, in evaluation of patient in the environment and initiation of primary care, an Intern shall: -

(1) effective participation with other members of the health team with qualities of leadership;

(2) make a community diagnosis in specific situations such as epidemics and institute relevant control measures for communicable diseases;

(3) Develop capability for analysis of hospital based morbidity and mortality statistics.

(4) Use essential drugs in the community with the awareness of availability, cost and side effects;

(5) Provide health education to an individual/community on :

a) tuberculosis;

b) small family, spacing, use of appropriate contraceptives;

c) applied nutrition and care of mothers and children;

d) immunization;

e) Participation in school health programme.

### (III) PRIMARY HEALTH CENTRE

- (1) Initiate or participate in family composite health care (birth to death), Inventory of events;
- (2) Participation in all of the modules on field practice for community health e.g. safe motherhood, nutrition surveillance and rehabilitation, diarrhea disorders etc.
- (3) Acquire competence in diagnosis and management of common ailments e.g. malaria, tuberculosis, enteric fever, congestive heart failure, hepatitis, meningitis acute renal failure etc.;
- (4) Acquire proficiency for Family Welfare Programmes (ante natal care, normal delivery, contraception care etc.)

#### **(ii) GENERAL MEDICINE**

(I) Interns shall acquire following training during their term.

(1) acquire competence for clinical diagnosis based on history physical examination and relevant laboratory investigation and institute appropriate line of management;

(2) This would include diseases common in tropics (parasitic, bacterial or viral infections, nutritional disorders, including dehydration and electrolyte disturbances) and system illnesses.

(II) The intern shall have assisted as a care team in intensive care of cardiac, respirator, hepatic, neurological and metabolic emergencies.

(III) The intern shall be able to conduct the following laboratory investigations:

- (a) Blood: (Routine haematology smear and blood groups);
- (b) Urine: (Routine chemical and microscopic);
- (c) Stool: (for ova/cyst and occult blood);
- (d) Sputum and throat swab for gram stain or acid fast stain and
- (e) Cerebro Spinal Fluid (CSF) for smear.

(IV) Conduct following diagnostic procedures:

(a) Urethral catheterisation;

Proctoscopy;

Ophthalmoscopy/Otoscopy;

Indirect laryngoscopy;

(b) Therapeutic procedures;

Insertion of Ryles Tube;

Pleural, ascetic tap, Cerebro Spinal Fluid (CSF) tap, installing or air way tube, Oxygen administration etc.

(V) Biopsy Procedures:

Liver, Kidney, Skin, Nerve, Lymph node, and muscle biopsy, Bone marrow aspiration, Biopsy of Malignant lesions on surface, Nasal/nerve/skin smear for leprosy.

(VI) (a) Familiarity with usage of life saving procedures: including use of aspirator, respirator and defibrillator,

(b) Competence in interpretation of different monitoring devices such as cardiac monitor, blood gas analysis etc.

(VII) Participate as a team member in total health care of an individual including appropriate follow-up and social rehabilitation.

(VIII) Other competencies as indicated in general objectives.

### **(iii) PAEDIATRICS:**

The details of the skills that an intern shall acquire during his/her tenure in the department of Paediatrics are as follows:

The intern shall be able to:

(1) Diagnose and manage common childhood disorders including neonatal disorders and acute emergencies (enquiry from parents of sick children), examining sick child making a record of information;

(2) Carry out activities related to patient care such as laboratory work, investigative procedures and use of special equipments. The details are given as under:-

(a) diagnostic techniques: blood (including from femoral vein and umbilical cord), obscess, cerebrospinal fluid, urine, pleura and peritoneum and common tissue

biopsy techniques;

(b) techniques related to patient care: immunization, perfusion techniques, feeding procedures, tuberculin testing & breast feeding counselling;

(c) use of equipment: vital monitoring, temperature monitoring, resuscitation at birth and care of children receiving intensive care;

(3) screening of newborn babies and those with objective risk factors for any anomalies and steps for prevention in future;

(4) plan in collaboration with parents and individual, collective surveillance of growth and development of new born babies, infants and children so that he/she is able to:

(a) recognise growth abnormalities;

(b) recognise anomalies of psychomotor development;

(c) detect congenital abnormalities;

(5) assess nutritional and dietary status of infants and children and organise prevention, detection and follow up of deficiency disorders both at individual and community level such as:

(a) protein-energy malnutrition

(b) deficiencies of vitamins especially A, B, C and D;

(c) Iron deficiency;

(6) Institute early management of common childhood disorders with special reference to Paediatrics dosage and oral rehydration therapy.

(7) Participate actively in public health programme oriented towards children in the community.



#### **(iv) GENERAL SURGERY**

An intern is expected to acquire following skills during his/her posting:

(A) Diagnose with reasonable accuracy all surgical illnesses including emergencies

1. resuscitate a critically injured patient and a severe burns patient;
2. control surface bleeding and manage open wound;
3. monitor patients of head, spine, chest abdominal and pelvic injury;
4. institute first-line management of acute abdomen;
5. perform venesection;
6. perform tracheostomy and endotracheal intubation;
7. catheterise patients with acute retention or perform trocar cystostomy,
8. drain superficial abscesses,
9. suturing of wound,
10. perform circumcision,
11. biopsy of surface tumours,
12. Perform vasectomy

#### **(v) CASUALTY:**

The intern after training in Casualty must be able to:

- (1) identify acute emergencies in various disciplines of medical practice;
- (2) manage acute anaphylactic shock;
- (3) manage peripheral-vascular failure and shock;
- (4) manage acute pulmonary oedema and Left Ventricular failure (LVF);
- (5) undertake emergency management of drowning, poisonings and seizures;
- (6) undertake emergency management of bronchial asthma and status asthmaticus;
- (7) undertake emergency management of hyperpyrexia;
- (8) undertake emergency management of comatose patients regarding airways positioning, prevention of aspiration and injuries;
- (9) assess and administer emergency management of burns;
- (10) assess and do emergency management of various trauma victims;
- (11) Identify medicolegal cases and learn filling up forms as well as complete other medicolegal formalities in cases of injury, poisoning, sexual offenses, intoxication and other unnatural conditions.

## **(vi) OBSTETRICS AND GYNAECOLOGY:**

Technical skills that interns are expected to learn:

- (1) diagnosis of early pregnancy and provision of ante-natal care;
- (2) diagnosis of pathology of pregnancy related to
  - (a) abortions;
  - (b) ectopic pregnancy;
  - (c) tumours complicating pregnancy;
  - (d) acute abdomen in early pregnancy;
  - (e) hyperemesis gravidarum;
- (3) detection of high risk pregnancy cases and suitable advise e.g. PIH, hydramanios, antepartum haemorrhage, multiple pregnancies, abnormal presentations and intra-uterine growth retardation;
- (4) antenatal pelvic assessment and detection of cephalopelvic disproportion;
- (5) induction of labour and amniotomy under supervision;
- (6) management of normal labour, detection of abnormalities, post-partum hemorrhage and repair of perennial tears;
- (7) assist in forceps delivery;
- (8) assist in caesarean section and postoperative care thereof;
- (9) detection and management of abnormalities of lactation;
- (10) perform non-stress test during pregnancy;
- (11) per speculum, per vaginum and per rectal examination for detection of common congenital, inflammatory, neoplastic and traumatic conditions of vulva, vagina, uterus and ovaries;
- (12) Medicolegal examination in Gynaecology and obstetrics
- (13) To perform the following procedures:-
  - (a) dilation and curettage and fractional curettage;
  - (b) endometrial biopsy;
  - (c) endometrial aspiration;
  - (d) pap smear collection;
  - (e) Intra Uterine Contraceptive Device (IUCD) insertion;
  - (f) Minilap ligation;
  - (g) Urethral catheterisation;

- (h) Suture removal in postoperative cases;
- (i) Cervical punch biopsy;

(14) To assist in major abdominal and vaginal surgery cases in Obstetrics and Gynaecology.

(15) To assist in follow-up postoperative cases of obstetrics and gynaecology such as:(a) Colposcopy;

(b) Second trimester Medical Termination of Pregnancy (MTP) procedures e.g. Emcredyl Prostaglandin instillations;

(16) To evaluate and prescribe oral contraceptive.

### **(vii) OTO RHINO LARYNGOLOGY (ENT)**

(1) Interns shall acquire ability for a comprehensive diagnosis of common Ear, Nose and Throat (ENT) diseases including the emergencies and malignant neoplasma of the head and neck;

(2) he/she shall acquire skills in the use of head mirror, otoscope and indirect laryngoscopy and first line of management of common Ear Nose and Throat (ENT) problems;

(3) he/she shall be able to carry out minor surgical procedures such as:

- (a) earsyringing antrum puncture and packing of the nose for epistaxis,
- (b) nasal douching and packing of the external canal,
- (c) Remove the foreign bodies from the nose and ear
- (d) Observed or assisted in various endoscopic procedures and trachesotomy;

(4) an item shall have participated as a team member in the community diagnosis e.g. Chronic Suppurative Otitis Media (CSOM) and be aware of national programme on prevention of deafness,

(5) He/she shall possess knowledge of various ENT rehabilitative programmes.

### **(viii) OPHTHALMOLOGY**

An intern shall acquire following skills: -

(1) he/she shall be able to diagnose and manage common ophthalmological conditions such as:-

Trauma, Acute conjunctivitis, allergic conjunctivitis, xerosis, entropion, corneal ulcer, iridocyclitis, myopia, hypermetropia, cataract, glaucoma, ocular injury and sudden loss of vision;

(2) he/she shall be able to carry out assessment of refractive errors and advise its correction;

(3) he/she shall be able to diagnose ocular changes in common systemic disorders;

(4) he/she shall be able to perform investigative procedures such as:-

Tonometry, syringing, direct ophthalmoscopy, subjective refraction and fluorescein staining of cornea.

(5) he/she shall have carried out or assisted the following procedures:

(1) Subconjunctival injection;

(2) Ocular bandaging;

(3) Removal of concretions;

(4) Epilation and electrolysis;

(5) Corneal foreign body removal;

(6) Cauterization of corneal ulcers;

(7) Chalazion removal;

(8) Entropion correction;

(9) Suturing conjunctival tears;

(10) Lids repair

(11) Glaucoma surgery (assisted);

(12) Enucleation of eye in cadaver;

(6) He/she shall have full knowledge on available methods for rehabilitation of the blind.

### **(ix) ORTHOPAEDICS; GOAL:**

The aim of teaching the undergraduate student in Orthopaedics and Rehabilitation is to impart such knowledge and skills that may enable him to diagnose and treat common ailments. He shall have ability to diagnose and suspect presence of fracture, dislocation, acute osteomyelitis, acute poliomyelitis and common congenital deformities such as congenital talipes equinovarus (CTEV) and dislocation of hip (CDH).

(A) **THERAPEUTIC-** An intern must know:

- (a) Splinting (plaster slab) for the purpose of emergency splintage, definitive splintage and post operative splintage and application of Thomas splint;
- (b) Manual reduction of common fractures – phalangeal, metacarpal, metatarsal and Colles's fracture;
- (c) Manual reduction of common dislocations – interphalangeal, metacarpophalangeal, elbow and shoulder dislocations;
- (d) Plaster cast application for undisplaced fractures of arm, fore arm, leg and ankle;
- (e) Emergency care of a multiple injury patient;
- (f) Precautions about transport and bed care of spinal cord injury patients.

**(B) Skill that an intern should be able to perform under supervision:**

- (1) Advise about prognosis of poliomyelitis, cerebral palsy, CTEV and CDH;
- (2) Advise about rehabilitation of amputees and mutilating traumatic and leprosy deformities of hand;

**(C) An intern must have observed or preferably assisted at the following operations:**

- (1) drainage for acute osteomyelitis;
- (2) sequestrectomy in chronic osteomyelitis;
- (3) application of external fixation;
- (4) internal fixation of fractures of long bones.

### **(x) DERMATOLOGY AND SEXUALLY TRANSMITTED DISEASES**

An intern must be able to: -

- (1) conduct proper clinical examination; elicit and interpret physical findings, and diagnose common disorders and emergencies.
- (2) Perform simple, routine investigative procedures for making bedside diagnosis, specially the examination of scraping for fungus, preparation of slit smears and staining for AFB for leprosy patient and for STD cases;

- (3) Take a skin biopsy for diagnostic purpose;
- (4) Manage common diseases recognizing the need for referral for specialized care in case of inappropriateness of therapeutic response.

**(xi) PSYCHIATRY:**

An Intern must be able to:

- (1) Diagnose and manage common psychiatric disorders;
- (2) Identify and manage psychological reaction and psychiatric disorders in medical and surgical patients in clinical practice and community setting.

**(xii) TUBERCULOSIS AND RESPIRATORY DISEASES**

An intern after training must be able to: -

- (1) conducting proper clinical examination, elicit and interpret clinical findings and diagnose common respiratory disorders and emergencies;
- (2) perform simple, routine investigative procedures required for making bed side diagnosis, specially sputum collection, examination for etiological organism like AFB, interpretation of chest X-rays and respiratory function tests;
- (3) Interpret and manage various blood gases and pH abnormalities in various respiratory diseases;
- (4) Manage common diseases recognizing need for referral for specialized care in case of inappropriateness of therapeutic response;
- (5) Perform common procedures like laryngoscopy, pleural aspiration, respiratory physiotherapy, laryngeal intubation and pneumo-thoracic drainage aspiration.

### **(xiii) ANAESTHESIA:**

After the internship in the department of Anaesthesiology an intern shall acquire knowledge, skill and attitude to:

- (1) Perform pre-anaesthetic check up and prescribe pre-anaesthetic medications;
- (2) perform venepuncture and set up intravenous drip;
- (3) perform laryngoscopy and endotracheal intubation;
- (4) perform lumbar puncture, spinal anaesthesia and simple nerve blocks;
- (5) conduct simple general anaesthetic procedures under supervision;
- (6) monitor patients during anaesthesia and post operative period;
- (7) recognise and manage problems associated with emergency anaesthesia;
- (8) maintain anaesthetic records;
- (9) recognise and treat complication in post operative period;
- (10) Perform cardio-pulmonary brain resuscitation (C.P.B.R.) correctly, including recognition of cardiac arrest.

### **(xiv) RADIO-DIAGNOSIS:**

An intern after training must be able to identify and diagnose:

- (1) all aspects of 'Emergency Room' Radiology like –
  - (a) all acute abdominal conditions;
  - (b) all acute traumatic conditions with emphasis on head injuries;
  - (c) differentiation between Medical and surgical radiological emergencies;
- (2) Basic hazards and precautions in Radio-diagnostic practices.

### **(xv) PHYSICAL MEDICINE AND REHABILITATION:**

An intern is expected to acquire the following skills during his/her internship: -

- (1) competence for clinical diagnosis based on details history an assessment of common disabling conditions like poliomyelitis, cerebral palsy, hemiplegia, paraplegia, amputations etc;
- (2) participation as a team member in total rehabilitation including appropriate follow up of common disabling conditions;
- (3) principles and procedures of fabrication and repair of artificial limbs and appliances;
- (4) various therapeutic modalities;
- (5) use of self help devices and splints and mobility aids;
- (6) familiarity with accessibility problems and home making for disabled;

(7) ability to demonstrate simple exercise therapy in common conditions like prevention of deformity in polio, stump exercise in an amputee etc.;

#### **(xvi) FORENSIC MEDICINE AND TOXICOLOGY**

The intern is to be posted in the casualty department of the hospital while attached under Forensic Medicine Department with the following objectives:

- (1) to identify medicolegal problem in a hospital and general practice;
- (2) to identify and learn medicolegal responsibilities of a medical man in various hospital situations;
- (3) to be able to diagnose and learn management of basic poisoning conditions in the community;
- (4) to learn how to handle cases of sexual assault;
- (5) to be able to prepare medico-legal reports in various medicolegal situations;
- (6) to learn various medicolegal post-mortem procedures and formalities during its performance by police.

*“Knowledge will forever govern ignorance: and a people who mean to be their own governors must arm themselves with the power which knowledge gives.”*

- *James Madison*



**GENERAL VITAL INFORMATION**  
**(PROFESSIONAL CONDUCT, ETIQUETTE AND ETHICS)**

**MEDICAL COUNCIL OF INDIA**

**CHAPTER I**

**1. CODE OF MEDICAL ETHICS**

A. Declaration: Each applicant, at the time of making an application for registration under the provisions of the Act, shall be provided a copy of the declaration and shall submit a duly signed Declaration as provided in Appendix 1. The applicant shall also certify that he/she had read and agreed to abide by the same.

B. Duties and responsibilities of the Physician in general:

1.1 Character of Physician (Doctors with qualification of MBBS or MBBS with post graduate degree/ diploma or with equivalent qualification in any medical discipline):

1.1.1 A physician shall uphold the dignity and honour of his profession.

1.1.2 The prime object of the medical profession is to render service to humanity; reward or financial gain is a subordinate consideration. Who- so-ever chooses his profession, assumes the obligation to conduct himself in accordance with its ideals. A physician should be an upright man, instructed in the art of healings. He shall keep himself pure in character and be diligent in caring for the sick; he should be modest, sober, patient, prompt in discharging his duty without anxiety; conducting himself with propriety in his profession and in all the actions of his life.

1.1.3 No person other than a doctor having qualification recognised by Medical Council of India and registered with Medical Council of India/State Medical Council (s) is allowed to practice Modern system of Medicine or Surgery. A person obtaining qualification in any other system of Medicine is not allowed to practice Modern system of Medicine in any form.

1.2 Maintaining good medical practice:

1.2.1 The Principal objective of the medical profession is to render service to humanity with full respect for the dignity of profession and man. Physicians should merit the confidence of patients entrusted to their care, rendering to each a full measure of service and devotion. Physicians should try continuously to improve medical knowledge and skills and should make available to their patients and colleagues the benefits of their professional attainments. The physician should practice methods of healing founded on scientific basis and should not associate professionally with anyone who violates this principle. The honoured ideals of the medical profession imply that the responsibilities of the physician extend not only to

individuals but also to society

1.2.2 **Membership in Medical Society:** For the advancement of his profession, a physician should affiliate with associations and societies of allopathic medical professions and involve actively in the functioning of such bodies.

1.2.3 A Physician should participate in professional meetings as part of Continuing Medical Education programmes, for at least 30 hours every five years, organized by reputed professional academic bodies or any other authorized organisations. The compliance of this requirement shall be informed regularly to Medical Council of India or the State Medical Councils as the case may be.

### 1.3 Maintenance of medical records:

1.3.1 Every physician shall maintain the medical records pertaining to his / her indoor patients for a period of 3 years from the date of commencement of the treatment in a standard proforma laid down by the Medical Council of India and attached as Appendix 3.

1.3.2. If any request is made for medical records either by the patients / authorised attendant or legal authorities involved, the same may be duly acknowledged and documents shall be issued within the period of 72 hours.

1.3.3 A Registered medical practitioner shall maintain a Register of Medical Certificates giving full details of certificates issued. When issuing a medical certificate he / she shall always enter the identification marks of the patient and keep a copy of the certificate. He / She shall not omit to record the signature and/or thumb mark, address and at least one identification mark of the patient on the medical certificates or report. The medical certificate shall be prepared as in Appendix 2.

1.3.4 Efforts shall be made to computerize medical records for quick retrieval.

### 1.4 Display of registration numbers:

1.4.1 Every physician shall display the registration number accorded to him by the State Medical Council / Medical Council of India in his clinic and in all his prescriptions, certificates, money receipts given to his patients.

1.4.2 Physicians shall display as suffix to their names only recognized medical degrees or such certificates/diplomas and memberships/honours which confer professional knowledge or recognizes any exemplary qualification/achievements.

1.5 Use of Generic names of drugs: Every physician should, as far as possible, prescribe drugs with generic names and he / she shall ensure that there is a rational prescription and use of drugs.

1.6 Highest Quality Assurance in patient care: Every physician should aid in safeguarding the profession against admission to it of those who are deficient in moral character or education. Physician shall not employ in connection with his professional practice any attendant who is neither registered nor enlisted under the Medical Acts in force and shall not permit such persons to attend, treat or perform operations upon patients wherever professional discretion or skill is required.

1.7 Exposure of Unethical Conduct: A Physician should expose, without fear or favour, incompetent or corrupt, dishonest or unethical conduct on the part of members of the profession.

1.8 Payment of Professional Services: The physician, engaged

in the practice of medicine shall give priority to the interests of patients. The personal financial interests of a physician should not conflict with the medical interests of patients. A physician should announce his fees before rendering service and not after the operation or treatment is under way. Remuneration received for such services should be in the form and amount specifically announced to the patient at the time the service is rendered. It is unethical to enter into a contract of "no cure no payment". Physician rendering service on behalf of the state shall refrain from anticipating or accepting any consideration.

1.9 Evasion of Legal Restrictions: The physician shall observe the laws of the country in regulating the practice of medicine and shall also not assist others to evade such laws. He should be cooperative in observance and enforcement of sanitary laws and regulations in the interest of public health. A physician should observe the

provisions of the State Acts like Drugs and Cosmetics Act, 1940; Pharmacy Act, 1948; Narcotic Drugs and Psychotropic substances Act, 1985; Medical Termination of Pregnancy Act, 1971; Transplantation of Human Organ Act, 1994; Mental Health Act, 1987; Environmental Protection Act, 1986; Pre-natal Sex Determination Test Act, 1994; Drugs and Magic Remedies (Objectionable Advertisement) Act, 1954; Persons with Disabilities (Equal Opportunities and Full Participation) Act, 1995 and Bio - Medical Waste (Management and Handling) Rules, 1998 and such other Acts, Rules, Regulations made by the Central/State Governments or local Administrative Bodies or any other relevant Act relating to the protection and promotion of public health.

## **CHAPTER 2**

### **2. DUTIES OF PHYSICIANS TO THEIR PATIENTS**

#### **2.1 Obligations to the Sick**

2.1.1 Though a physician is not bound to treat each and every person asking his services, he should not only be ever ready to respond to the calls of the sick and

the injured, but should be mindful of the high character of his mission and the responsibility he discharges in the course of his professional duties. In his treatment, he should never forget that the health and the lives of those entrusted to his care depend on his skill and attention. A physician should endeavour to add to the comfort of the sick by making his visits at the hour indicated to the patients. A physician advising a patient to seek service of another physician is acceptable, however, in case of emergency a physician must treat the patient. No physician shall arbitrarily refuse treatment to a patient. However for good reason, when a patient is suffering from an ailment which is not within the range of experience of the treating physician, the physician may refuse treatment and refer the patient to another physician.

2.1.2 Medical practitioner having any incapacity detrimental to the patient or which can affect his performance vis-à-vis the patient is not permitted to practice his profession

2.2 Patience, Delicacy and Secrecy : Patience and delicacy should characterize the physician. Confidences concerning individual or domestic life entrusted by patients to a physician and defects in the disposition or character of patients observed during medical attendance should never be revealed unless their revelation is required by the laws of the State. Sometimes, however, a physician must determine whether his duty to society requires him to employ knowledge, obtained through confidence as a physician, to protect a healthy person against a communicable disease to which he is about to be exposed. In such instance, the physician should act as he would wish another to act toward one of his own family in like circumstances.

2.3 Prognosis: The physician should neither exaggerate nor minimize the gravity of a patient's condition. He should ensure himself that the patient, his relatives or his responsible friends have such knowledge of the patient's condition as will serve the best interests of the patient and the family.

2.4 The Patient must not be neglected: A physician is free to choose whom he will serve. He should, however, respond to any request for his assistance in an emergency. Once having undertaken a case, the physician should not neglect the patient, nor should he withdraw from the case without giving adequate notice to the patient and his family. Provisionally or fully registered medical practitioner shall not willfully commit an act of negligence that may deprive his patient or patients from necessary medical care.

2.5 Engagement for an Obstetric case: When a physician who has been engaged to attend an obstetric case is absent and another is sent for and delivery accomplished, the acting physician is entitled to his professional fees, but should secure the patient's consent to resign on the arrival of the physician engaged.

## **CHAPTER 3**

### **3. DUTIES OF PHYSICIAN IN CONSULTATION**

#### **3.1 Unnecessary consultations should be avoided:**

3.1.1 However in case of serious illness and in doubtful or difficult conditions, the physician should request consultation, but under any circumstances such consultation should be justifiable and in the interest of the patient only and not for any other consideration.

3.1.2 Consulting pathologists /radiologists or asking for any other diagnostic Lab investigation should be done judiciously and not in a routine manner.

3.2 Consultation for Patient's Benefit: In every consultation, the benefit to the patient is of foremost importance. All physicians engaged in the case should be frank with the patient and his attendants.

3.3 Punctuality in Consultation: Utmost punctuality should be observed by a physician in making themselves available for consultations.

#### **3.4 Statement to Patient after Consultation:**

3.4.1 All statements to the patient or his representatives should take place in the presence of the consulting physicians, except as otherwise agreed. The disclosure of the opinion to the patient or his relatives or friends shall rest with the medical attendant.

3.4.2 Differences of opinion should not be divulged unnecessarily but when there is irreconcilable difference of opinion the circumstances should be frankly and impartially explained to the patient or his relatives or friends. It would be opened to them to seek further advice as they so desire.

3.5 Treatment after Consultation: No decision should restrain the attending physician from making such subsequent variations in the treatment if any unexpected change occurs, but at the next consultation, reasons for the variations should be discussed/ explained. The same privilege, with its obligations, belongs to the consultant when sent for in an emergency during the absence of attending physician. The attending physician may prescribe medicine at any time for the patient, whereas the consultant may prescribe only in case of emergency or as an expert when called for.

3.6 Patients Referred to Specialists: When a patient is referred to a specialist by the attending physician, a case summary of the patient should be given to the specialist, who should communicate his opinion in writing to the attending physician.

### 3.7 Fees and other charges:

3.7.1 A physician shall clearly display his fees and other charges on the board of his chamber and/or the hospitals he is visiting. Prescription should also make clear if the Physician himself dispensed any medicine.

3.7.2 A physician shall write his name and designation in full along with registration particulars in his prescription letter head.

Note: In Government hospital where the patient-load is heavy, the name of the prescribing doctor must be written below his/her signature.

## **CHAPTER 4**

### **4. RESPONSIBILITIES OF PHYSICIANS TO EACH OTHER**

4.1 Dependence of Physicians on each other : and privilege to render gratuitous service to dependants.

A physician should consider it as a pleasure all physicians and their immediate family

4.2 Conduct in consultation : In consultations, no insincerity, rivalry or envy should be indulged in. All due respect should be observed towards the physician in-charge of the case and no statement or remark be made, which would impair the confidence reposed in him. For this purpose no discussion should be carried on in the presence of the patient or his representatives.

4.3 Consultant not to take charge of the case: When a physician has been called for consultation, the Consultant should normally not take charge of the case, especially on the solicitation of the patient or friends. The Consultant shall not criticize the referring physician. He / she shall discuss the diagnosis treatment plan with the referring physician.

4.4 Appointment of Substitute: Whenever a physician requests another physician to attend his patients during his temporary absence from his practice, professional courtesy requires the acceptance of such appointment only when he has the capacity to discharge the additional responsibility along with his / her other duties. The physician acting under such an appointment should give the utmost consideration to the interests and reputation of the absent physician and all such patients should be restored to the care of the latter upon his/her return.

4.5 Visiting another Physician's Case: When it becomes the duty of a physician occupying an official position to see and report upon an illness or injury, he should communicate to the physician in attendance so as to give him an option of being present. The medical officer / physician occupying an official position should avoid remarks upon the diagnosis or the treatment that has been adopted.

## **CHAPTER 5**

### **5 DUTIES OF PHYSICIAN TO THE PUBLIC AND TO THE**

#### **PARAMEDICAL PROFESSION**

5.1 Physicians as Citizens: Physicians, as good citizens, possessed of special training should disseminate advice on public health issues. They should play their part in enforcing the laws of the community and in sustaining the institutions that advance the interests of humanity. They should particularly co-operate with the authorities in the administration of sanitary/public health laws and regulations.

5.2 Public and Community Health: Physicians, especially those engaged in public health work, should enlighten the public concerning quarantine regulations and measures for the prevention of epidemic and communicable diseases. At all times the physician should notify the constituted public health authorities of every case of communicable disease under his care, in accordance with the laws, rules and regulations of the health authorities. When an epidemic occurs a physician should not abandon his duty for fear of contracting the disease himself.

5.3 Pharmacists / Nurses: Physicians should recognize and promote the practice of different paramedical services such as, pharmacy and nursing as professions and should seek their cooperation wherever required.

## **CHAPTER 6**

### **6. UNETHICAL ACTS:**

A physician shall not aid or abet or commit any of the following acts which shall be construed as unethical -

#### **6.1 Advertising:**

6.1.1 Soliciting of patients directly or indirectly, by a physician, by a group of physicians or by institutions or organisations is unethical. A physician shall not make use of him / her (or his / her name) as subject of any form or manner of advertising or publicity through any mode either alone or in conjunction with others which is of such a character as to invite attention to him or to his professional position, skill, qualification, achievements, attainments, specialities, appointments, associations, affiliations or honours and/or of such character as would ordinarily result in his self aggrandizement. A physician shall not give to any person, whether for compensation or otherwise, any approval, recommendation, endorsement, certificate, report or statement with respect of any drug, medicine, nostrum remedy, surgical, or therapeutic article, apparatus or appliance or any commercial product or article with respect of any property, quality or use thereof or any test, demonstration or trial thereof, for use in connection with his name, signature, or photograph in any form or manner of advertising through any mode nor shall he boast of cases,

operations, cures or remedies or permit the publication of report thereof through any mode. A medical practitioner is however permitted to make a formal announcement in press regarding the following:

- (1) On starting practice.
- (2) On change of type of practice.
- (3) On changing address.
- (4) On temporary absence from duty.
- (5) On resumption of another practice.
- (6) On succeeding to another practice.
- (7) Public declaration of charges.

6.1.2 Printing of self photograph, or any such material of publicity in the letter head or on sign board of the consulting room or any such clinical establishment shall be regarded as acts of self advertisement and unethical conduct on the part of the physician. However, printing of sketches, diagrams, picture of human system shall not be treated as unethical.

6.2 Patent and Copy rights: A physician may patent surgical instruments, appliances and medicine or Copyright applications, methods and procedures. However, it shall be unethical if the benefits of such patents or copyrights are not made available in situations where the interest of large population is involved.

6.3 Running an open shop (Dispensing of Drugs and Appliances by Physicians): - A physician should not run an open shop for sale of medicine for dispensing prescriptions prescribed by doctors other than himself or for sale of medical or surgical appliances. It is not unethical for a physician to prescribe or supply drugs, remedies or appliances as long as there is no exploitation of the patient. Drugs prescribed by a physician or brought from the market for a patient should explicitly state the proprietary formulae as well as generic name of the drug.

#### 6.4 Rebates and Commission:

6.4.1 A physician shall not give, solicit, or receive nor shall he offer to give solicit or receive, any gift, gratuity, commission or bonus in

consideration of or return for the referring, recommending or procuring of any patient for medical, surgical or other treatment. A physician shall not directly or indirectly, participate in or be a party to act of division, transference, assignment, subordination, rebating, splitting or refunding of any fee for medical, surgical or other treatment.

6.4.2 Provisions of para 6.4.1 shall apply with equal force to the referring, recommending or procuring by a physician or any person, specimen or material for diagnostic purposes or other study / work. Nothing in this section, however, shall prohibit payment of salaries by a qualified physician to other duly qualified person rendering medical care under his supervision.



6.5 Secret Remedies: The prescribing or dispensing by a physician of secret remedial agents of which he does not know the composition, or the manufacture or promotion of their use is unethical and as such prohibited. All the drugs prescribed by a physician should always carry a proprietary formula and clear name.

6.6 Human Rights: The physician shall not aid or abet torture nor shall he be a party to either infliction of mental or physical trauma or concealment of torture inflicted by some other person or agency in clear violation of human rights.

6.7 Euthanasia: Practicing euthanasia shall constitute unethical conduct. However on specific occasion, the question of withdrawing supporting devices to sustain cardio-pulmonary function even after brain death, shall be decided only by a team of doctors and not merely by the treating physician alone. A team of doctors shall declare withdrawal of support system. Such team shall consist of the doctor in charge of the patient, Chief Medical Officer / Medical Officer in charge of the hospital and a doctor nominated by the in-charge of the hospital from the hospital staff or in accordance with the provisions of the Transplantation of Human Organ Act, 1994.

The Clause No. 6.8, as under, is included in terms of Notification published on 14.12.2009 in Gazette of India & the same is also enclosed as Annexure - I.

“6.8 Code of conduct for doctors and professional association of doctors in their relationship with pharmaceutical and allied health sector industry.

6.8.1 In dealing with Pharmaceutical and allied health sector industry, a medical practitioner shall follow and adhere to the stipulations given below:-

- a) Gifts: A medical practitioner shall not receive any gift from any pharmaceutical or allied health care industry and their sales people or representatives.
- b) Travel facilities: A medical practitioner shall not accept any travel facility inside the country or outside, including rail, air, ship, cruise tickets, paid vacations etc. from any pharmaceutical or allied healthcare industry or their representatives for self and family members for vacation or for attending conferences, seminars, workshops, CME programme etc as a delegate.
- c) Hospitality: A medical practitioner shall not accept individually any hospitality like hotel accommodation for self and family members under any pretext.
- d) Cash or monetary grants: A medical practitioner shall not receive any cash or monetary grants from any pharmaceutical and allied healthcare industry for individual purpose in individual capacity under any pretext. Funding for medical research, study etc. can only be received through approved institutions by modalities laid down by law / rules / guidelines adopted by such approved institutions, in a transparent manner. It shall always be fully disclosed.

e) **Medical Research:** A medical practitioner may carry out, participate in, work in research projects funded by pharmaceutical and allied healthcare industries. A medical practitioner is obliged to know that the fulfillment of the following items (i) to (vii) will be an imperative for undertaking any research assignment / project funded by industry – for being proper and ethical. Thus, in accepting such a position a medical practitioner shall:-

- (i) Ensure that the particular research proposal(s) has the due permission from the competent concerned authorities.
- (ii) Ensure that such a research project(s) has the clearance of national/ state / institutional ethics committees / bodies.
- (iii) Ensure that it fulfils all the legal requirements prescribed for medical research.
- (iv) Ensure that the source and amount of funding is publicly disclosed at the beginning itself.
- (v) Ensure that proper care and facilities are provided to human volunteers, if they are necessary for the research project(s).
- (vi) Ensure that undue animal experimentations are not done and when these are necessary they are done in a scientific and a humane way.
- (vii) Ensure that while accepting such an assignment a medical practitioner shall have the freedom to publish the results of the research in the greater interest of the society by inserting such a clause in the MoU or any other document / agreement for any such assignment.

f) **Maintaining Professional Autonomy:** In dealing with pharmaceutical and allied healthcare industry a medical practitioner shall always ensure that there shall never be any compromise either with his / her own professional autonomy and / or with the autonomy and freedom of the medical institution.

g) **Affiliation:** A medical practitioner may work for pharmaceutical and allied healthcare industries in advisory capacities, as consultants, as researchers, as treating doctors or in any other professional capacity. In doing so, a medical practitioner shall always:

- (i) Ensure that his professional integrity and freedom are maintained. Ensure that patients interest are not compromised in any way.
- (ii) Ensure that such affiliations are within the law.
- (iii) Ensure that such affiliations / employments are fully transparent and disclosed.

h) **Endorsement:** A medical practitioner shall not endorse any drug or product of the industry publically. Any study conducted on the efficacy or otherwise of such products shall be presented to and / or through appropriate scientific bodies or published in appropriate scientific journals in a proper way”.

## CHAPTER 7

7. MISCONDUCT : The following acts of commission or omission on the part of a physician shall constitute professional misconduct rendering him/her liable for disciplinary action

7.1 Violation of the Regulations: If he/she commits any violation of these Regulations.

7.2 If he/she does not maintain the medical records of his/her indoor patients for a period of three years as per regulation 1.3 and refuses to provide the same within 72 hours when the patient or his/her authorised representative makes a request for it as per the regulation 1.3.2.

7.3 If he/she does not display the registration number accorded to him/her by the State Medical Council or the Medical Council of India in his clinic, prescriptions and certificates etc. issued by him or violates the provisions of regulation 1.4.2.

7.4 Adultery or Improper Conduct: Abuse of professional position by committing adultery or improper conduct with a patient or by maintaining an improper association with a patient will render a Physician liable for disciplinary action as provided under the Indian Medical Council Act, 1956 or the concerned State Medical Council Act.

7.5 Conviction by Court of Law: Conviction by a Court of Law for offences involving moral turpitude / Criminal acts.

7.6 Sex Determination Tests: On no account sex determination test shall be undertaken with the intent to terminate the life of a female foetus developing in her mother's womb, unless there are other absolute indications for termination of pregnancy as specified in the Medical Termination of Pregnancy Act, 1971. Any act of termination of pregnancy of normal female foetus amounting to female foeticide shall be regarded as professional misconduct on the part of the physician leading to penal erasure besides rendering him liable to criminal proceedings as per the provisions of this Act.

7.7 Signing Professional Certificates, Reports and other Documents: Registered medical practitioners are in certain cases bound by law to give, or may from time to time be called upon or requested to give certificates, notification, reports and other documents of similar character signed by them in their professional capacity for subsequent use in the courts or for administrative purposes etc. Such documents, among others, include the ones given at Appendix –4. Any registered practitioner who is shown to have signed or given under his name and authority any such certificate, notification, report or document of a similar character which is untrue, misleading or improper, is liable to have his name deleted from the Register.

7.8 A registered medical practitioner shall not contravene the provisions of the

Drugs and Cosmetics Act and regulations made there under. Accordingly,

a) Prescribing steroids/ psychotropic drugs when there is no absolute medical indication;

b) Selling Schedule „H” & „L” drugs and poisons to the public except to his patient; in contravention of the above provisions shall constitute gross professional misconduct on the part of the physician.

7.9 Performing or enabling unqualified person to perform an abortion or any illegal operation for which there is no medical, surgical or psychological indication.

7.10 A registered medical practitioner shall not issue certificates of efficiency in modern medicine to unqualified or non-medical person.

(Note: The foregoing does not restrict the proper training and instruction of bonafide students, midwives, dispensers, surgical attendants, or skilled mechanical and technical assistants and therapy assistants under the personal supervision of physicians.)

7.11 A physician should not contribute to the lay press articles and give interviews regarding diseases and treatments which may have the effect of advertising himself or soliciting practices; but is open to write to the lay press under his own name on matters of public health, hygienic living or to deliver public lectures, give talks on the radio/TV/internet chat for the same purpose and send announcement of the same to lay press.

7.12 An institution run by a physician for a particular purpose such as a maternity home, nursing home, private hospital, rehabilitation centre or any type of training institution etc. may be advertised in the lay press, but such advertisements should not contain anything more than the name of the institution, type of patients admitted, type of training and other facilities offered and the fees.

7.13 It is improper for a physician to use an unusually large sign board and write on it anything other than his name, qualifications obtained from a University or a statutory body, titles and name of his speciality, registration number including the name of the State Medical Council under which registered. The same should be the contents of his prescription papers. It is improper to affix a sign- board on a chemist’s shop or in places where he does not reside or work.

7.14 The registered medical practitioner shall not disclose the secrets of a patient that have been learnt in the exercise of his / her profession except –

- i) in a court of law under orders of the Presiding Judge;
- ii) in circumstances where there is a serious and identified risk to a specific person and / or community; and notifiable diseases.

In case of communicable / notifiable diseases, concerned public health authorities

should be informed immediately.

7.15 The registered medical practitioner shall not refuse on religious grounds alone to give assistance in or conduct of sterility, birth control, circumcision and medical termination of Pregnancy when there is medical indication, unless the medical practitioner feels himself/herself incompetent to do so.

7.16 Before performing an operation the physician should obtain in writing the consent from the husband or wife, parent or guardian in the case of minor, or the patient himself as the case may be. In an operation which may result in sterility the consent of both husband and wife is needed.

7.17 A registered medical practitioner shall not publish photographs or case reports of his / her patients without their permission, in any medical or other journal in a manner by which their identity could be made out. If the identity is not to be disclosed, the consent is not needed.

7.18 In the case of running of a nursing home by a physician and employing assistants to help him / her, the ultimate responsibility rests on the physician.

7.19 A Physician shall not use touts or agents for procuring patients.

7.20 A Physician shall not claim to be specialist unless he has a special qualification in that branch.

7.21 No act of invitro fertilization or artificial insemination shall be undertaken without the informed consent of the female patient and her spouse as well as the donor. Such consent shall be obtained in writing only after the patient is provided, at her own level of comprehension, with sufficient information about the purpose, methods, risks, inconveniences, disappointments of the procedure and possible risks and hazards.

7.22 Research: Clinical drug trials or other research involving patients or volunteers as per the guidelines of ICMR can be undertaken, provided ethical considerations are borne in mind. Violation of existing ICMR guidelines in this regard shall constitute misconduct. Consent taken from the patient for trial of drug or therapy which is not as per the guidelines shall also be construed as misconduct.

7.23 If a physician posted in rural area is found absent on more than two occasions during inspection by the Head of the District Health Authority or the Chairman, Zila Parishad, the same shall be construed as a misconduct if it is recommended to the Medical Council of India/State Medical Council by the State Government for action under these Regulations.

x. If a physician posted in a medical college/institution both as teaching faculty or otherwise shall remain in hospital/college during the assigned duty hours. If they are found absent on more than two occasions during this period, the same shall be construed as a misconduct if it is certified by the Principal/Medical Superintendent

and forwarded through the State Government to Medical Council of India/State Medical Council for action under these Regulations.

## **CHAPTER 8**

### **8. PUNISHMENT AND DISCIPLINARY ACTION**

8.1 It must be clearly understood that the instances of offences and of Professional misconduct which are given above do not constitute and are not intended to constitute a complete list of the infamous acts which calls for disciplinary action, and that by issuing this notice the Medical Council of India and or State Medical Councils are in no way precluded from considering and dealing with any other form of professional misconduct on the part of a registered practitioner. Circumstances may and do arise from time to time in relation to which there may occur questions of professional misconduct which do not come within any of these categories. Every care should be taken that the code is not violated in letter or spirit. In such instances as in all others, the Medical Council of India and/or State Medical Councils have to consider and decide upon the facts brought before the Medical Council of India and/or State Medical Councils.

8.2 It is made clear that any complaint with regard to professional misconduct can be brought before the appropriate Medical Council for Disciplinary action. Upon receipt of any complaint of professional misconduct, the appropriate Medical Council would hold an enquiry and give opportunity to the registered medical practitioner to be heard in person or by pleader. If the medical practitioner is found to be guilty of committing professional misconduct, the appropriate Medical Council may award such punishment as deemed necessary or may direct the removal altogether or for a specified period, from the register of the name of the delinquent registered practitioner. Deletion from the Register

shall be widely publicized in local press as well as in the 330publications of different Medical Associations/ Societies/Bodies.

8.3 In case the punishment of removal from the register is for a limited period, the appropriate Council may also direct that the name so removed shall be restored in the register after the expiry of the period for which the name was ordered to be removed.

8.4 Decision on complaint against delinquent physician shall be taken within a time limit of 6 months.

8.6 During the pendency of the complaint the appropriate Council may restrain the physician from performing the procedure or practice which is under scrutiny.

8.7 Professional incompetence shall be judged by peer group as per guidelines prescribed by Medical Council of India.

8.8 The following Clause No. 8.7 & 8.8 are included in terms of Notification published on 27.05.2004 in Gazette of India & the same is also enclosed as Annexure - III. -

“8.7 Where either on a request or otherwise the Medical Council of India is informed that any complaint against a delinquent physician has not been decided by a State Medical Council within a period of six months from the date of receipt of complaint by it and further the MCI has reason to believe that there is no justified reason for not deciding the complaint within the said prescribed period, the Medical Council of India may-

***(i) Impress upon the concerned State Medical council to conclude and decide the complaint within a time bound schedule;***

(ii) May decide to withdraw the said complaint pending with the concerned State Medical Council straightaway or after the expiry of the period which had been stipulated by the MCI in accordance with para(i) above, to itself and refer the same to the Ethical Committee of the Council for its expeditious disposal in a period of not more than six months from the receipt of the complaint in the office of the Medical Council of India.”

“8.8 Any person aggrieved by the decision of the State Medical Council on any complaint against a delinquent physician, shall have the right to file an appeal to the MCI within a period of 60 days from the date of receipt of the order passed by the said Medical Council:

Provided that the MCI may, if it is satisfied that the appellant was prevented by sufficient cause from presenting the appeal within the aforesaid period of 60 days, allow it to be presented within a further period of 60 days.

**APPENDIX - 1**

**A. DECLARATION**

At the time of registration, each applicant shall be given a copy of the following declaration by the Registrar concerned and the applicant shall read and agree to abide by the same:

- 1) I solemnly pledge myself to consecrate my life to service of humanity.
- 2) Even under threat, I will not use my medical knowledge contrary to the laws of Humanity.
- 3) I will maintain the utmost respect for human life from the time of conception.
- 4) I will not permit considerations of religion, nationality, race, party politics or social standing to intervene between my duty and my patient.
- 5) I will practice my profession with conscience and dignity.
- 6) The health of my patient will be my first consideration.
- 7) I will respect the secrets which are confined in me.
- 8) I will give to my teachers the respect and gratitude which is their due.
- 9) I will maintain by all means in my power, the honour and noble traditions of medical profession.
- 10) I will treat my colleagues with all respect and dignity.
- 11) I shall abide by the code of medical ethics as enunciated in the Indian Medical Council (Professional Conduct, Etiquette and Ethics) Regulations 2002.

I make these promises solemnly, freely and upon my honour.

Signature .....

Name .....

Place .....

Address.....

.....

.....

Date .....

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**APPENDIX – 2**

**1. FORM OF CERTIFICATE RECOMMENDED FOR LEAVE OR EXTENSION OR COMMUNICATION OF LEAVE AND**

FOR FITNESS

Signature of patient or thumb impression \_\_\_\_\_

To be filled in by the applicant in the presence of the Government Medical Attendant, or Medical Practitioner.

Identification marks:-

1. \_\_\_\_\_

2. \_\_\_\_\_

I, Dr. \_\_\_\_\_ after careful examination of the case certify hereby that \_\_\_\_\_ whose signature is given above is suffering from \_\_\_\_\_ and I consider that a period of absence from duty of \_\_\_\_\_ with effect from \_\_\_\_\_ is absolutely necessary for the restoration of his health.

I, Dr. \_\_\_\_\_ after careful examination of the case certify hereby that \_\_\_\_\_ on restoration of health is now fit to join service.

Place \_\_\_\_\_ Signature of Medical attendant.

Date \_\_\_\_\_ Registration No. \_\_\_\_\_

(Medical Council of India / State Medical Council of ..... State)

Note:- The nature and probable duration of the illness should also be specified . This certificate must be accompanied by a brief resume of the case giving the nature of the illness, its symptoms, causes and duration.

**APPENDIX-3**

**FORMAT FOR MEDICAL RECORD**

(See regulation 3.1)

Name of the patient :

Age :

Sex :

Address :

Occupation :

Date of 1st visit :

Clinical note (summary)  
of the case :

Prov.: Diagnosis :

Investigations advised  
with reports :

Diagnosis after  
investigation :

Advice :

Follow up :

Date:

Observations:

Signature in full .....

Name of Treating Physician

\_\_\_\_\_

## APPENDIX –4

### LIST OF CERTIFICATES, REPORTS, NOTIFICATIONS ETC. ISSUED BY DOCTORS FOR THE PURPOSES OF VARIOUS ACTS / ADMINISTRATIVE REQUIREMENTS

- a) Under the acts relating to birth, death or disposal of the dead.
- b) Under the Acts relating to Lunacy and Mental Deficiency and under the Mental illness Act and the rules made thereunder.
- c) Under the Vaccination Acts and the regulations made thereunder.
- d) Under the Factory Acts and the regulations made thereunder.
- e) Under the Education Acts.
- f) Under the Public Health Acts and the orders made thereunder.
- g) Under the Workmen’s Compensation Act and Persons with Disability Act.
- h) Under the Acts and orders relating to the notification of infectious diseases.
- i) Under the Employee’s State Insurance Act.
- j) In connection with sick benefit insurance and friendly societies.
- k) Under the Merchant Shipping Act.
- l) For procuring / issuing of passports.
- m) For excusing attendance in courts of Justice, in public services, in public offices or in ordinary employment.
- n) In connection with Civil and Military matters.
- o) In connection with matters under the control of Department of Pensions.
- p) In connection with quarantine rules.
- q) For procuring driving licence.

*A man is but the product of his thoughts what he thinks  
We must become the change we want to see  
Happiness is when what you think,  
what you say, and what you do are in harmony  
- Mahatma Gandhi*