MANUFACTURING TECHNOLOGY

CASTING

1) The ability of the moulding sand to withstand the heat of melt without showing any sign of s called as

a. strength or cohesiveness
b. Refractiveness
c. collapsibility
d. adhesiveness

2) A model of casting, constructed to use for forming a mould in damp sand, is called as

a. sand construction
b. pattern
c. cover
d. none of the above

3) Which of the following is not a requirement of a good pattern?

a. It should be light in weight to handle easily
b. It should be smooth to make casting surface smooth
c. It should have low strength to break it and to remove casting easily
d. none of the above

4) The patterns which are made in two or more pieces are called as

a. solid patters
b. split patterns
c. loose piece patterns
d. none of the above

5) Permeability can be defined as the property of moulding sand

a. to hold sand grains together
b. to allow gases to escape easily from the mould

c. to withstand the heat of melt without showing any sign of softening
d. none of the above

6) The sand in its natural or moist state is called as

a. green sand
b. loam sand
c. dry sand
d. none of the above

7) What is the highest possible percentage of clay contents in loam sand?

a. 10
b. 20
c. 30
d. 50

8) Match the following contents of green sand in Group 1 with their approximate per cent in G

1. Silica ---------- A. 5 to 10 per cent
2. Clay ---------- B. 2 to 5 per cent
3. Bentonite ---------- C. 8 to 15 per cent
4. Coal dust ---------- D. 7 to 8 per cent
5. Water ---------- E. up to 75 per cent

a. 1-(E), 2-(C), 3-(B), 4-(A), 5-(D)
b. 1-(E), 2-(A), 3-(B), 4-(C), 5-(D)
c. 1-(C), 2-(D), 3-(B), 4-(A), 5-(E)
d. 1-(C), 2-(A), 3-(B), 4-(D), 5-(E)

9) Which of the following sentences is/are correct for casting process?

a. Casting process is comparatively costly
b. Objects of larges sizes cannot be produced easily by casting process
c. The time required for the process of making casting is quite long
d. All of the above sentences are correct

10) The productivity of casting process is comparatively

a. lower than the productivity of other automatic processes like rolling
b. higher than the productivity of other automatic processes like rolling
c. similar to the productivity of other automatic processes like rolling
d. Unpredictable

11) Which casting process has no size and shape limits?

a. Sand casting
b. Shell-mould casting
c. Plaster-mould casting
d. none of the above

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12) Blow holes in casting are caused by

a. excessive moisture
b. low permeability
c. excessive fine grains
d. all of the above

This set of Manufacturing Engineering Multiple Choice Questions & Answers (MCQs) focuses on “Various Casting Process”.

13. Injection moulding is a type of
a) Die casting
b) Centrifugal casting
c) Squeeze casting

d) Investment casting

14. Which of the following problem is not correct about die casting?
a) It has close dimensional accuracy
b) Die has good life
c) It is very economical for large scale production
d) No need for removing the entrapped gases

15. Which type of casting is preferred for making hollow pipes and tubes which are axisymmetric with concentric holes?
a) Centrifuging
b) True centrifugal casting
c) Semi-centrifugal casting
d) None of the mentioned

16. Which of the following casting is a combination of casting and forging?
a) Die casting
b) Centrifugal casting
c) Squeeze casting
d) Investment casting

17. In plaster mould casting the mould is made from
a) $CaSO_4$
b) $CaSO_3$
c) $CaSO_2$
d) None of the mentioned

18. In which casting process the sand is mixed with a thermosetting resin to form a mould?
a) Die casting
b) Centrifugal casting
c) Squeeze casting

d) Shell moulding

19. The resins used in shell moulding are?
a) Diphenyl aldehyde
b) Phenol formaldehyde
c) Methyl formaldehyde
d) Dimethyl formaldehyde

20. Which casting is used to make hollow casting with thin walls?
a) Die casting
b) Centrifugal casting
c) Slush casting
d) Shell moulding

21. In investment casting process which of the following is used for pattern making?
a) Ceramics
b) Molten wax
c) Silica
d) Plaster of paris

22. Which of the following are the examples of precision casting process?
a) Plastic mould casting
b) Ceramic mould casting
c) Investment casting
d) All of the mentioned

23. The major defects of casting are
a) gas defects
b) shrinkage cavities
c) molding material defects
d) all of the mentioned

24. _____ is a condition existing in a casting caused by the trapping of gas in the molten metal or by mold gases evolved during the pouring of the casting.

a) gas defects

b) shrinkage cavities

c) molding material defects

d) none of the mentioned

25.. The causes of gas defects are

a) metal contains gas

b) mold is too hot

c) poor mold burnout

d) all of the mentioned

26. _____ are caused by liquid shrinkage occurring during the solidification of the casting.

a) gas defects

b) shrinkage cavities

c) molding material defects

d) none of the mentioned

27. The molding material defects are

a) cut and washes

b) metal penetration

c) fusion

d) all of the mentioned

28. A _____ is caused when the metal is unable to fill the mold cavity completely and thus leaves unfilled cavities.

a) cold shut

b) mis run

c) all of the mentioned

d) none of the mentioned

29. A _____ is caused when two streams while meeting in the mold cavity, do not fuse together properly thus forming a discontinuity in the casting.

a) cold shut

b) mis run

c) all of the mentioned

d) none of the mentioned

View Answer

30. A casting defect which occurs near the ingates as rough lumps on the surface of a casting is

a) Shift

b) Sand wash

c) Swell

d) None of the mentioned

31. A casting defect which occurs due to improper venting of sand is known as

a) Cold shuts

b) Blow holes

c) Shift

d) None of the mentioned

32. Scabs are casting defects which

a) result in a mismatch of the top and bottom parts of a casting

b) result near the ingates as rough lumps on the surface of a casting

c) occur as rough and irregular projections on the surface of the casting

d) none of the mentioned

33. If we decrease the freezing range then the fluidity of metal will?

a) Increase

b) Decrease

c) Will not change

d) Will increase then decrease

34. According to Chvorinov's rule the solidification time is a function of volume and surface area and is given by the relationship between volume, area and some exponential power 'n'. Here the value of n is

a) 1

b) 2

c) 3

d) 4

35. Which one of the following expands during contraction?

a) Mild steel

b) Grey cast iron

c) Aluminium

d) Copper

36. Dissolved gases may be removed from molten metal by

a) Flushing or purging with inert gas

b) Melting and pouring the metal in vacuum

c) Both of the mentioned

d) None of the Mentioned

37. Doubling the time in flat mould will increase the thickness of wall skin by what percentage?

a) 31.6%

b) 41%

c) 73%

d) 22%

38. Solidification of casting does not depend upon which factor?

a) Type of metal

b) Thermal properties of metal

c) Geometric relationship between volume and surface area

d) Surface tension.

39. The following characteristic of molten metal influence the fluidity
1) Mushy zone
2) Viscosity
3) Surface tension
4) Inclusion
Which one of the following is correct?
a) 1,2
b) 1 only
c) 1,2,3
d) 1,2,3,4

40. What is the function of cores used in casting?
a) To remove dissolved gases
b) To avoid defects
c) To form hollow region
d) To reduce shrinkage porosity

41. Which one of the statement is correct in metal casting?
a) Rapid cooling produces a solidified skin or shell
b) Those grain that have favorable orientation will grow preferentially
c) Cast iron has wide mushy zones
d) Lack of uniformity in grains size and distribution will cause anisotropic properties
View Answer

42. Assertion (A): Chills are used to reduce shrinkage porosity.
Reason (R): the function of chill is to increase the rate of solidification in critical region.
a) Both A and R is correct and R is a correct explanation for A
b) Both A and R is correct and R is an incorrect explanation for A
c) A is wrong but R is correct
d) A is correct but R is wrong

43. The allowance provided to take care of the contraction of a casting is known as
a) Draft allowance

b) Shrinkage allowance
c) Machining allowance
d) Shake allowance

44. Which one of the following is true?
a) Contraction of liquid takes place from the pouring temperature to the freezing temperature
b) Contraction is associated with the change of phase from liquid to solid
c) Contraction of solid is from the freezing temperature to the room temperature
d) All of the Mentioned

45. While calculating the linear dimension of a material shrinkage allowance is always
a) Added
b) Subtracted
c) Multiplied
d) Divided

46. Which one of the following is a negative allowance?
a) Draft allowance
b) Shrinkage allowance
c) Shake allowance
d) Machining allowance

47. Which one of the following is used to make patterns?
a) Wood
b) Plastics
c) Metals
d) All of the Mentioned

48. Which one of the following will not give good dimensional accuracy in the presence of moisture?
a) Wood
b) Plastics

c) Metals
d) None of the Mentioned

49. The choice of pattern material depends upon:
i. On size of casting
ii. Number of casting to be made from pattern
iii. Dimensional accuracy
Which of the following is correct?
a) i, ii
b) i only
c) i, ii, iii
d) ii, iii

50. In order to reduce the chances of damage due to withdrawing of pattern from the mould is done by giving
a) Draft allowance
b) Shrinkage allowance
c) Distortion allowance
d) Shake allowance

51. To have good surface finish and accuracy which of the allowance is given?
a) Draft allowance
b) Shrinkage allowance
c) Shake allowance
d) Machining allowance

52. For good dimensional tolerances and smooth surface which of the following is used as pattern material?
a) Wood
b) Plastics
c) Metals
d) Ceramics

53. In _____ process, the metal is poured into the mold and begins to solidify at the ceramic walls.

a) conventional casting

b) directional solidification

c) single crystal

d) none of the mentioned

54. In _____ process, the ceramic mold is preheated by radiant heating.

a) conventional casting

b) directional solidification

c) single crystal

d) none of the mentioned

55. In _____ process, the mold has a constriction in the shape of a corkscrew or helix.

a) conventional casting

b) directional solidification

c) single crystal

d) none of the mentioned

56 _____ is a major activity in the semiconductor industry.

a) Conventional casting

b) Directional solidification

c) Single crystal growing

d) None of the mentioned

57. _____ of cast components is determined by sealing the openings in the casting.

a) Surface defects

b) Pressure tightness

c) Ductility

d) None of the mentioned

58. In _____ testing, specimens are removed from various sections of a casting.

a) surface defects

b) pressure tightness

c) destructive

d) none of the mentioned

59. In _____ the alloy is melted by induction in a ceramic crucible.

a) conventional casting

b) melt spinning

c) single crystal

d) none of the mentioned

60. In _____ a seed crystal is dipped into the molten metal and then pulled out slowly.

a) crystal pulling method

b) melt spinning

c) single crystal

d) none of the mentioned

61. In _____ a rod of polycrystalline silicon rests on a single crystal and an induction coil heats these two pieces.

a) crystal pulling method

b) melt spinning

c) floating zone

d) none of the mentioned

62. In _____ dopants are added.

a) crystal pulling method

b) melt spinning

c) floating zone

d) none of the mentioned

63. The lower molding flask is also known as

a) Drag

b) Cope

c) Check

d) None of the Mentioned

64. The entry point through which molten metal enters mould cavity is by

a) Gate

b) Chaplet

c) Chill

d) Riser

65. A small funnel shaped cavity at the top of the mould into which the metal is poured is known as
a) Sprue
b) Core
c) Pouring basin
d) Gate

66. Which of the following is used to support the cavity from inside?
a) Chill
b) Chaplet
c) Sprue
d) Core

67. Riser is a reservoir of molten metal provided in the casting so that hot metal can flow back into the mould cavity when there is a reduction in volume of metal due to
a) Compression
b) Solidification
c) Expansion
d) None of the Mentioned

68. The passage ways in the parting plane through which molten flow is regulated is known as
a) Core
b) Chaplet
c) Gate
d) Runner

69. The passageway through which the molten metal from the pouring basin reaches the mould cavity is known as
a) Sprue
b) Gate

c) Flask
d) Riser

70. The replica of the final object to be made is known as
a) Parting line
b) Flask
c) Pattern
d) Mould

71. Depending upon the position of the flask in the mould structure the flask is also referred as
a) Drag
b) Cope
c) Check
d) All of the Mentioned

72. Which of the following is made of wood?
a) Gate
b) Riser
c) Bottom board
d) Chill

73. In which type of gating system aspiration effect takes place?
a) Vertical
b) Horizontal
c) Diagonal
d) Bottom

74. The gating ratio Sprue area: Runner area: In gate area for non pressurized casting is?
a) 1:2:2

b) 2:2:1

c) 1:4:4

d) 1:4:2

75. Which of the following is a type of riser?

a) Top

b) Blind

c) Internal

d) All of the Mentioned

76. Caine curve is a graph between?

a) Volume ratio and Solidification ratio

b) Volume ratio to freezing ratio

c) Volume ratio to heating ratio

d) Freezing ratio to time ratio

77. To prevent heavier and lighter impurities which of the following system is used?

a) Skim bob

b) Pouring basin

c) Strainer

d) Splash core

View Answer

78. To reduce the eroding force of the liquid metal which of the following system is used?

a) Skim bob

b) Pouring basin

c) Strainer

d) Riser

79. If velocity of metal flow at gate is 4m/sec, volume of mould is .1 cubic meters and the cross sectional area of gate is 0.002 cubic meters then the time required to fill up the mould in seconds is?

a) 10

b) 12

c) 12.5
d) 15.5

80. If the volume is to area ratio for riser is 2 and for casting it is 4 then the freezing ratio is?
a) 2
b) 4
c) 8
d) .5

81. Time required to fill the mould by vertical gating system is _____ to bottom gating system?
a) Less
b) More
c) Equal
d) None of the Mentioned

82. A mould has a down sprue length of .2 meters. The velocity of metal in meter/second at gate will be?
a) 1.78
b) 1.98
c) 2.3
d) 2.5

83. The _____ process uses a polystyrene pattern.
a) investment casting
b) ceramic-shell casting
c) evaporative-pattern casting
d) none of the mentioned

84. The _____ process is used to make typical parts such as gears, cams, valves etc.

a) investment casting

b) ceramic-shell casting

c) evaporative-pattern casting

d) none of the mentioned

85. In _____ two halves of a mold are made from materials with high resistance.

a) investment casting

b) permanent-mold casting

c) evaporative-pattern casting

d) none of the mentioned

86. To increase the life of permanent molds, the surfaces of the mold cavity usually are coated with a

a) refractory slurry

b) silver

b) aluminum

d) none of the mentioned

87. _____ is an alternative to investment, shell-mold, and green-sand casting.

a) Vacuum Casting

b) Permanent-mold casting

c) Evaporative-pattern casting

d) None of the mentioned

88. Hollow castings with thin walls can be made by permanent-mold casting using

a) vacuum casting

b) slush casting

c) evaporative-pattern casting

d) none of the mentioned

89. In _____ the molten metal is forced upward by gas pressure into a graphite or metal mold.

a) vacuum casting

b) slush casting

c) pressure casting

d) none of the mentioned

90. _____ are made of two or more different materials.

a) Composite molds

b) Centrifuging

c) Die casting

d) none of the mentioned

91. In _____ the metal is heated to just above its solidus temperature and poured into a vessel to cool it down to the semisolid state.

a) vacuum casting

b) rheocasting

c) pressure casting

d) none of the mentioned

92. The advantages of semisolid metal forming over die casting are

a) the structures developed are homogeneous, with uniform properties

b) casting as well as wrought alloys can be used

c) the lower superheat results in shorter cycle times

d) all of the mentioned

93.Which of the following is not a principle constituent of molding sand?

a) Silica

b) Aluminum

c) Iron oxide

d) Copper

94. When sand is in its natural moist state it is known as

a) Green sand

b) Facing sand

c) Loam sand

d) Dry sand

95. Which of the following sand contains clay up to 50% and dries hard?

a) Green sand

b) Facing sand

c) Loam sand

d) Dry sand

View Answer

96. Which of the following sand is black in color?
a) Green sand
b) Facing sand
c) Loam sand
d) Backing sand

97.Which of the following sand is placed next to the surface and comes in contact with the molten metal?
a) Green sand
b) Facing sand
c) Loam sand
d) Backing sand

98. Green strength of sand depends upon which of the following parameters?
a) Grain size
b) Moisture content
c) Shape and distribution of sand
d) All of the Mentioned

99. The strength of the sand which is required to hold the shape of mould cavity when the metal in the mould is still in liquid form, is known as
a) Hot strength
b) Green strength
c) High strength
d) None of the Mentioned

100. Which of the following will have a better plasticity?
a) Coarse sand
b) Fine grained sand
c) Semi grained sand
d) None of the Mentioned

101. The passage of gaseous material, water and steam vapor through the molding sand is known as
a) Plasticity
b) Flowability
c) Permeability
d) Refractoriness
View Answer

102. Which of the following sand is coated with phenol or urea formaldehyde resins?

a) Shell sand

b) Green sand

c) Dry sand

d) Facing sand

METAL FORMING

1. In which process the cross section of the metal is reduced by forcing it to flow through a die under high pressure?
a) Forging
b) Forming
c) Extrusion
d) Welding
View Answer

Answer: c
Explanation: The process of reducing cross section of a metal by forcing it to flow through a die is known as extrusion. It is one of the forming processes.

2. Which of the following is a type of extrusion process?
a) Direct
b) Indirect
c) Impact
d) All the above mentioned
View Answer

Answer: d
Explanation: All the above mentioned is a type of extrusion process.Extrusion may be direct, indirect or impact.

3. Which of the following is true about extrusion process?
a) Structure is homogeneous
b) No time is lost in changing the shape
c) Service life of extrusion tool is too high
d) Its leading end is in good shape as compared to rolling
View Answer

Answer: b
Explanation: No time is lost in changing the shape as the dies may be readily removed in the process of extrusion.

4. In which extrusion process the direction of flow of metal is in same direction as that of ram?
a) Direct
b) Indirect
c) Impact
d) Hydrostatic
View Answer

Answer: a
Explanation: In direct extrusion process the direction of flow of metal is in same direction as that of ram Where as it is opposite in indirect extrusion.

1) Good surface finish and better dimensional accuracy can be achieved in

a. cold working process
b. hot working process
c. both a. and b.
d. none of the above
Answer Explanation
ANSWER: cold working process
Explanation:
No explanation is available for this question!

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2) Mechanical working processes are performed on metals

a. to achieve optimum mechanical properties in the metal
b. to improve the mechanical strength of the metal
c. to make metal dense
d. all of the above
Answer Explanation
ANSWER: all of the above
Explanation:
No explanation is available for this question!

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3) Hot working process is the plastic deformation of metal which is carried out

a. at temperature below the recrystallisation temperature
b. at temperature above the recrystallisation temperature
c. at temperature equals to boiling point of water
d. none of the above
Answer Explanation
ANSWER: at temperature above the recrystallisation temperature
Explanation:
No explanation is available for this question!

4) Which of the following are the cold working processes?

(1) Forging
(2) Bending
(3) Squeezing
(4) Pipe Welding
(5) Drawing

a. (1), (2) and (3)
b. (2), (3) and (5)
c. (2), (4) and (5)
d. (1), (2), (3) and (5)
Answer Explanation
ANSWER: (2), (3) and (5)
Explanation:
No explanation is available for this question!

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5) Worm working or semi-hot working process, which is the plastic deformation of metal or alloy under conditions of temperature and strain rate, is performed to eliminate drawbacks of

a. cold working process
b. hot working process
c. both cold and hot working processes
d. none of the above
Answer Explanation
ANSWER: both cold and hot working processes
Explanation:
No explanation is available for this question!

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6) The volume of metal that enters the rolling stand

a. should increase after rolling process
b. should decrease after rolling process
c. should remain same after rolling process
d. unpredictable
Answer Explanation
ANSWER: should remain same after rolling process
Explanation:
No explanation is available for this question!

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7) Which characteristic of material is used in forging process?

a. characteristics of elasticity of material

b. characteristics of ductility of material
c. characteristics of plasticity of material
d. none of the above
Answer Explanation
ANSWER: characteristics of plasticity of material
Explanation:
No explanation is available for this question!

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8) How does the ability of material to withstand unpredictable loads change after forging?

a. The ability of material to withstand unpredictable loads increases after forging
b. The ability of material to withstand unpredictable loads decreases after forging
c. The ability of material to withstand unpredictable loads does not change after forging
d. Unpredictable
Answer Explanation
ANSWER: The ability of material to withstand unpredictable loads increases after forging
Explanation:
No explanation is available for this question!

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9) Castings are usually

a. costlier than forgings
b. cheaper than forgings
c. at the same rate as forging for similar metal
d. none of the above
Answer Explanation
ANSWER: cheaper than forgings
Explanation:
No explanation is available for this question!

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10) Match the following Tools used in smithy in Group 1 with their Applications in Group 2 and select the correct option.

1. Sledge hammers, straight, flat and cross peen ---------- A. To nick the bar and to shape the cold work
2. Smith ball peen hammer ---------- B. To make recesses of any shape in hot metal
3. Punches ---------- C. To cut plates to curves
4. Hardie ---------- D. To forge

art, bend and shape the work
5. Anvil ---------- E. To forge light and medium work
6. Gouge ---------- F. To forge big jobs

a. 1-(E), 2-(F), 3-(A), 4-(B), 5-(C), 6-(D)
b. 1-(E), 2-(F), 3-(B), 4-(A), 5-(D), 6-(C)
c. 1-(F), 2-(E), 3-(A), 4-(B), 5-(C), 6-(D)
d. 1-(F), 2-(E), 3-(B), 4-(A), 5-(D), 6-(C)
Answer Explanation
ANSWER: 1-(F), 2-(E), 3-(B), 4-(A), 5-(D), 6-(C)
Explanation:
No explanation is available for this question!

11) What is the process, in which the metal is caused to flow through a restricted orifice to create an extremely elongated strip of uniform and comparatively smaller cross-sectional area, called?

a. Rolling
b. Extrusion
c. Drawing
d. Spinning
Answer Explanation
ANSWER: Extrusion
Explanation:
No explanation is available for this question!

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12) In circular drawing process, when the depth of drawing is more than the diameter of the die, then the process is called as

a. forced drawing
b. hollow drawing
c. deep drawing
d. all of the above
Answer Explanation
ANSWER: deep drawing
Explanation:
No explanation is available for this question!

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13) Chances of crack propagation are more in

a. cold working process
b. hot working process

c. both a. and b.
d. none of the above
Answer Explanation
ANSWER: cold working process
Explanation:
No explanation is available for this question!

The cold working of metal is accomplished at

a. below re-crystallization temperature
b. below re-crystallization temperature
c. re-crystallization temperature
d. any of the above

(Ans:a)

Which of the following is not improved by cold working of metals?

a. hardness
b. toughness
c. surface finish
d. corrosion resistance

(Ans:d)

Which of the following operation can be performed on lathe?

a. spinning
b. drawing
c. coining
d. swaging

(Ans:a)

Tubes for shaving cream and tooth paste are made by

a. forward extrusion
b. backward extrusion
c. impact extrusion
d. all of the above

(Ans:c)

Medals are made by

a. spinning
b. coining
c. embossing
d. bending

(Ans:c)

Which of the following is not true for cold working of metals?

a. residual stresses are set up in the metal
b. stress required to cause deformation is less than hot working of metals
c. it reduces the corrosion resistance of the metal
d. distortion of grains takes place in most of the cold working processes

(Ans:b)

Wires are made by

a. spinning
b. drawing
c. embossing
d. bending

(Ans:b)

Ornamental wares are made by

a. spinning
b. drawing
c. embossing
d. bending

(Ans:c)

All processes are formed in both hot and cold working except

a. forging
b. piercing
c. drawing
d. extrusion

(Ans:d)

Which of the following not a hot working process?

a. extrusion
b. drawing
c. embossing
d. piercing

(Ans:c)

The hot working of metal, is accomplished at

a. below recrystallization temperature
b. above recrystallization temperature
c. recrystallization temperature
d. any of the above

(Ans:b)

Following are the advantages of hot working of metals, except

a. close tolerances can be maintained
b. porosity of the metal is minimized
c. grain structure of the metal is refined
d. no residual stresses are introduced

(Ans:a)

Which of the following process is used to convert larger sections, such as ingots into smaller sections?

a. hot rolling
b. hot forging
c. hot spinning
d. hot extrusion

(Ans:a)

The following are true for rolling, except

a. velocity of metal at exit is same as that at the entry
b. grains are elongated in the direction of rolling
c. after crossing the stress zone the grain starts refining
d. the greater the coefficient of friction more the possible reduction

(Ans:a)

In rolling, the pressure is maximum at

a. entrance
b. exit
c. both the extremities
d. at a point somewhat between the two extremities

(Ans:d)

In rolling, the point of maximum pressure is called

a. no slip point
b. slip point
c. neutral point
d. extreme point

(Ans:a)

Tubes can be manufactured by

a. hot forging
b. hot spinning
c. hot extrusion
d. hot rolling

(Ans:c)

During extrusion of steel, adequate lubrication around the billet is done by providing a coating of

a. vegetable oil
b. graphite
c. water
d. powdered glass

(Ans:d)

In backward or indirect extrusion, _____ plunger is used

a. solid
b. hollow
c. no
d. both solid and hollow

(Ans:b)

Which of the following is true for hot extrusion?

a. less force is required in forward extrusion as compared to backward extrusion
b. more force is required in forward extrusion as compared to backward extrusion
c. same force is applied in both forward and backward extrusion
d. any of the above

(Ans:b)

All methods are used for producing tubes except

a. hot spinning
b. hot extrusion
c. hot drawing
d. hot piercing

(Ans:a)

1.
Advantage of cold working is(
a) better dimensional accuracy (
b) better surface finish(
c) higher strength (
d) all of these.
Ans) d

2.
Typical hot working temperature range for steel is(
A) 650–1050°C (
b) 650–723°C(
c) 500–910°C (

d) none of these.
Ans) a

3.
The forging operation of “upsetting” is(
a
) reverse of drawing down process (
b
) it is a bending operation(
c
) it is a drifting operation (
d
) none of these.
Ans) a

4.
“Alligatoring” is a defect associated with(
a
) forging process (
b
) casting process(
c
) extrusion process (
d
) rolling process.
Ans) d

5.
A “die” is used in(
a
) casting process (
b
) extrusion process(
c
) forging process (
d
) all of these.
Ans) d

6.
Out of the following, which is the defect which is not associated with casting process:(
a
) Blow holes (
b
) Scale(
c

) Centre burst (
d
) Hot tear.
Ans) c

7.
Which “term” is not associated with casting process?(
a
) Gate (
b
) Runner (
c
) Riser (
d
) Swage.
Ans) d

8.
Fuel used in a cupola consists of (
a
) steam coal (
b
) furnace oil (
c
) electricity (
d
) hard coke.
Ans) d

9.
Which allowance is not provided on the “pattern” made for a casting ?(
a
) Machining allowance (
b
) Solidification allowance(
c
) Draft allowance (
d
) Shrinkage allowance.
Ans) b

10.
“Blanking” is an expression used in(
a
) sheet metal work (
b

) casting process(
c
) drawing (
d
) rolling.
Ans) a

. Punching a number of holes in a sheet is known as?
a) Perforating
b) Parting
c) Notching
d) Lancing
View Answer
Answer: a
Explanation: Punching a number of holes in a sheet is known as perforating. Removing the pieces from the edge in shearing operation is known as notching.
2. Shearing the sheet into two or more pieces is known as?
a) Perforating
b) Parting
c) Notching
d) Lancing
View Answer
Answer: b
Explanation: Shearing the sheet into two or more pieces is known as parting.
3. Removing the pieces from the edge in shearing operation is known as?
a) Perforating
b) Parting
c) Notching
d) Lancing
View Answer
Answer: c
Explanation: Punching a number of holes in a sheet is known as perforating. Removing the pieces from the edge in shearing operation is known as notching.
4. Leaving a tab without removing any material is known as?
a) Perforating
b) Parting
c) Notching
d) Lancing
View Answer
Answer: d
Explanation: Punching a number of holes in a sheet is known as perforating. Leaving a tab without removing any material is known as lancing.
5. Moving a small straight punch up and down rapidly into a die is done by a process known as?
a) Perforating

b) Parting
c) Nibbling
d) Lancing
View Answer
Answer: c
Explanation: Moving a small straight punch up and down rapidly into a die is done by a process known as nibbling. Leaving a tab without removing any material is known as lancing.
6. As the thickness of sheet is increased the clearance needed will also?
a) Increase
b) Decrease
c) No effect
d) First decrease then increase
View Answer
Answer: a
Explanation: As the thickness of sheet is increased the clearance needed will also increase. Clearance needed is directly proportional to thickness of sheet.
7. Beveling is particularly suitable for shearing of?
a) Thin blanks
b) Thick blanks
c) Very thin blanks
d) None of the Mentioned
View Answer
Answer: b
Explanation: Beveling is particularly suitable for shearing of thick blanks.
8. Which of the following is a type of die?
a) Simple dies
b) Progressive dies
c) Compound die
d) All of the Mentioned
View Answer
Answer: d
Explanation: All the above options are correct. In investment casting process molten wax is used for pattern making. It is costly process but have a very good dimensional accuracy.
9. Which of the following die can perform multiple operations such as blanking, punching, notching etc.?
a) Simple dies
b) Progressive dies
c) Compound die
d) None of the Mentioned
View Answer
Answer: b
Explanation: Progressive die can perform multiple operations such as blanking, punching, notching etc. In investment casting process molten wax is used for pattern making. It is costly process but have a very good dimensional accuracy.

10. As the clearance increases, the punch force required?
a) Decreases
b) Increases
c) Remains same
d) First increases then decrease
View Answer
Answer: a
Explanation: As the clearance increases, the punch force required decreases. As the thickness of sheet is increased the clearance needed will also increase. Clearance needed is directly proportional to thickness of sheet.

9. To remove the scales after forging operation which of the following cleaning operation is done?
a) Pickling in acid
b) Shot peening
c) Both of the mentioned
d) None of the mentioned
View Answer
Answer: c
Explanation: Scales generated after forging operations are removed by using pickling in acid method and shot peeing method.

8. Which of the following defects results due to improper forging?
a) Seams
b) Cracks
c) Laps
d) All of the Mentioned
View Answer
Answer: d
Explanation: Seams, cracks and laps are the defect, which arises due to improper forging method..

3. Which of the following statement is not correct about coining process?
a) It is a closed die forging process
b) It is used in minting of coin, jewelry etc.
c) Lubrication is not used
d) None of the Mentioned
View Answer
Answer: d
Explanation: Coining is a forging process which is used for minting of coins, jewellery etc.

1. In which forging process cross section of a bar is reduced or shaped by passing it through a pair of rolls with shaped grooves?
a) Skew rolling
b) Roll forging
c) Press forging
d) Upsetting
View Answer
Answer: b
Explanation: Process of reducing cross section of bar by using rollers is known as roll forging.

4. Coining and forming are two special kind of which forging operation?
a) Upset
b) Press
c) Hubbing
d) Swaging
View Answer
Answer: b
Explanation: Coining and forming are two special kind of press forging operation.

9. Which operation is used in making raised figures on sheets with its corresponding relief on the other side?
a) Roll forging
b) Embossing
c) Coining
d) Heading
View Answer
Answer: b
Explanation: Embossing is used in making raised figures on sheets with its corresponding relief on the other side.

1. Shaping of metal by squeezing them in between two or more dies in order to obtain desire shape is done by?
a) Forming
b) Forging
c) Welding
d) Grinding
View Answer
Answer: b
Explanation: Shaping of metal by squeezing them in between two or more dies in order to obtain desire shape is done by forging.
2. Forging is carried out at which temperature?
a) Below re crystallization temperature
b) Above re crystallization temperature

c) Both of the mentioned
d) None of the Mentioned
View Answer
Answer: c
Explanation: Forging is carried out at a temperature below re crystallization temperature in cold forging and above re crystallization temperature in hot forging.
3. Which of the following is a type of forging?
a) Open die
b) Closed die
c) Impression dies
d) All of the Mentioned
View Answer
Answer: d
Explanation: All the above mentioned options are the types of forging. In open die forging metal is kept in the lower die.
4. In which of the following forging metal is kept in the lower die?
a) Open die
b) Closed die
c) Impression dies
d) None of the Mentioned
View Answer
Answer: a
Explanation: In open die forging metal is kept in the lower die. In closed die forging process metal is kept in between pair of dies and a gutter is provided in the lower die.
5. In which of the forging process metal is kept in between pair of dies and a gutter is provided in the lower die?
a) Open die
b) Closed die
c) Impression dies
d) None of the Mentioned
View Answer
Answer: b
Explanation: In closed die forging process metal is kept in between pair of dies and a gutter is provided in the lower die. In impression die forging process metal is kept in between pair of dies and no gutter is provided in the lower die.
6. In which of the forging process metal is kept in between pair of dies and no gutter is provided in the lower die?
a) Open die
b) Closed die
c) Impression dies
d) None of the Mentioned
View Answer
Answer: c
Explanation: In impression die forging process metal is kept in between pair of dies and no gutter is provided in the lower die. In closed die forging process metal is kept in between pair of dies and a gutter is provided in the lower die.

8. In which of the following forging process no flash is formed?
a) Open die
b) Closed die
c) Impression dies
d) None of the Mentioned
View Answer
Answer: b
Explanation: In closed die forging process no flash is formed. In closed die forging process metal is kept in between pair of dies and a gutter is provided in the lower die.
9. In which of the following forging process poor material utilization occurs?
a) Open die
b) Closed die
c) Impression dies
d) None of the Mentioned
View Answer
Answer: a
Explanation: In open die forging process poor material utilization occurs. In open die forging metal is kept in the lower die. In closed die forging process metal is kept in between pair of dies and a gutter is provided in the lower die.

13. In _____ extrusion, a billet is placed in a chamber.
a) forward
b) indirect
c) hydrostatic
d) none of the mentioned
View Answer
Answer: a
Explanation: In forward extrusion, a billet is placed in a chamber and forced through a die opening by a hydraulically driven ram. The die opening may be round, or it may have various shapes, depending on the desired profile.
14. In _____ extrusion, the die moves toward the unextruded billet.
a) forward
b) indirect
c) hydrostatic
d) none of the mentioned
View Answer
Answer: b
Explanation: In indirect extrusion, (also called reverse, inverted, or backward extrusion), the die moves toward the unextruded billet. Indirect extrusion has the advantage of having no billet-container friction, since there is no relative motion.
15. In _____ extrusion, the billet is smaller in diameter than the chamber.
a) forward
b) indirect
c) hydrostatic

d) none of the mentioned
View Answer
Answer: c
Explanation: In hydrostatic extrusion the billet is smaller in diameter than the chamber (which is filled with a fluid), and the pressure is transmitted to the fluid by a ram.

1. In which process the cross section of the metal is reduced by forcing it to flow through a die under high pressure?
a) Forging
b) Forming
c) Extrusion
d) Welding
View Answer

Answer: c
Explanation: The process of reducing cross section of a metal by forcing it to flow through a die is known as extrusion. It is one of the forming processes.
2. Which of the following is a type of extrusion process?
a) Direct
b) Indirect
c) Impact
d) All the above mentioned
View Answer

Answer: d
Explanation: All the above mentioned is a type of extrusion process.Extrusion may be direct, indirect or impact.
3. Which of the following is true about extrusion process?
a) Structure is homogeneous
b) No time is lost in changing the shape
c) Service life of extrusion tool is too high
d) Its leading end is in good shape as compared to rolling
View Answer

Answer: b
Explanation: No time is lost in changing the shape as the dies may be readily removed in the process of extrusion.
4. In which extrusion process the direction of flow of metal is in same direction as that of ram?
a) Direct
b) Indirect
c) Impact
d) Hydrostatic
View Answer

Answer: a
Explanation: In direct extrusion process the direction of flow of metal is in same direction as that of ram Where as it is opposite in indirect extrusion.

5. In direct extrusion process at higher temperature which of the following is used to avoid friction?
a) Oil
b) Lubricants
c) Molten glasses
d) Wax
View Answer

Answer: c
Explanation:As friction is the major problem in direct extrusion,hence molten glasses are used to avoid friction.
6. Which of the following is not used because of the problem of handling extruded metal coming out through moving ram?
a) Direct
b) Indirect
c) Impact
d) Hydrostatic
View Answer

Answer: b
Explanation: Indirect extrusion method is not used because of the problem of handling extruded metal coming out through moving ram.
7. Which of the following is also known as cold extrusion process?
a) Direct
b) Indirect
c) Impact
d) Hydrostatic
View Answer

Answer: c
Explanation: Impact extrusion is also known as cold extrusion process because working temperature is low in impact extrusion.
8. In which of the following process frictional loss is eliminated at the billet container interface?
a) Direct
b) Indirect
c) Impact
d) Hydrostatic
View Answer

Answer: d
Explanation: In hydrostatic extrusion process frictional loss is eliminated at the billet container interface. This elimination increases the quality of product.
9. In which of the following process fluid medium is used to apply the load on the billet?
a) Direct
b) Indirect
c) Impact
d) Hydrostatic
View Answer

Answer: d
Explanation: In hydrostatic extrusion process fluid medium is used to apply the load on the billet. As hydro stands for fluid and static for rest.
10. Extrusion is similar to?
a) Rolling
b) Forming
c) Welding
d) Casting
View Answer

Answer: a
Explanation: Extrusion is similar rolling in producing constant cross sectional shape.

1. In which of the following process the work piece is pulled through a die resulting in reduction of area?
a) Forging
b) Drawing
c) Forming
d) Extrusion
View Answer
Answer: b
Explanation: In drawing process the work piece is pulled through a die resulting in reduction of area. Degree of drawing is measured in terms of reduction in area.
2. In drawing which angle allows the introduction of lubricant into the working zone?
a) Entrance angle
b) Die angle
c) Semi -die angle
d) Relief angle
View Answer
Answer: a
Explanation: Entrance angle allows the introduction of lubricant into the working zone.
3. Degree of drawing is measured in terms of?
a) Reduction in stress
b) Reduction in force
c) Reduction in area
d) Reduction in strain
View Answer
Answer: c
Explanation: Degree of drawing is measured in terms of reduction in area. In drawing process the work piece is pulled through a die resulting in reduction of area.
4. The maximum reduction in cross sectional area per pass is?
a) 45%
b) 63%
c) 55%
d) 67%
View Answer

Answer: b
Explanation: Maximum reduction in cross sectional area per pass is 63%. In drawing process the work piece is pulled through a die resulting in reduction of area.
5. Which of the following die is used in drawing flat strips?
a) Square shaped
b) Rectangular shaped
c) Circular shaped
d) Wedge shaped
View Answer
Answer: d
Explanation: Wedge shaped die is used in drawing flat strips.
6. With increase in reduction the drawing force?
a) Decreases
b) Increases
c) Does not change
d) First increases then decreases
View Answer
Answer: b
Explanation: With the increase in reduction the drawing force increases.
7. Which of the following angle influence the drawing force and the quality of drawn products?
a) Entrance angle
b) Die angle
c) Relief angle
d) None of the Mentioned
View Answer
Answer: b
Explanation: Die angle influence the drawing force and the quality of drawn products. Die angle should be kept appropriate for better surface finish.
8. Degree of drawing is given by the expression?
a) (d_i-d_f)
b) (A_i-A_f)
c) $(A_i-A_f)/A_i$
d) $1-((d_f-d_i))$
View Answer
Answer: c
Explanation: Degree of drawing is given by the expression$(A_i-A_f)/A_i$. Where d is the diameter of tube.
9. If the initial diameter is 50mm2 and the final diameter after drawing is 40mm2, then the degree of drawing is?
a) .64
b) .20
c) .80
d) .36
View Answer

Answer: d
Explanation: Degree of drawing is given by $[1- (d_f/d_i)^2]$. Where d is the diameter of tube.
10. If the degree of drawing is 0.5 and the initial area is 100mm2 then the final area in mm2 is equal to?
a) 50
b) 60
c) 40
d) 30
View Answer
Answer: a
Explanation: Degree of drawing= $(A_i-A_f)/A_i$. Where d is the diameter of tube, A is area.

NON TRADITIONAL MACHINING

1. Non-Traditional machining is recommended when we need which of the following features?
a) Complex shapes
b) High surface quality
c) Low-rigidity structures
d) All of the mentioned

2. Non-Traditional machining can also be called as?
a) Contact Machining
b) Non-contact machining
c) Partial contact machining
d) Half contact machining

3. In which of the following industries, Non-traditional machining methods play an important role?
a) Automobile
b) Aerospace
c) Medical
d) All of the mentioned
Answer____

4. Different classifications of Non-traditional machining based on source of energy are?
a) Mechanical
b) Thermal
c) Chemical and electro-chemical.
d) All of the mentioned
Answer____

5. In mechanical machining, material is removed by _____
a) Erosion

b) Corrosion
c) Abrasion
d) Vaporization
Answer____

6. Material in thermal machining is removed by which of the following means?
a) Vaporization
b) Melting
c) Electro-plating
d) All of the mentioned
Answer____

7. Which of the following process comes under mechanical machining?
a) USM
b) EDM
c) LBM
d) PAM
Answer____

8. Surface defects that may be occurred during thermal machining are?
a) Micro cracking
b) Heat affected zones
c) Striations
d) All of the mentioned
Answer____

9. Sources used in thermal machining are?
a) Ions
b) Plasma
c) Electrons
d) All of the mentioned
Answer____

10. Vacuum is the machining medium for?
a) LBM
b) WJM
c) EBM
d) None of the mentioned
Answer____

11. In chemical machining is material removal takes by?
a) Chemical reaction
b) Erosion

c) Electron removal
d) None of the mentioned
Answer____

12. An example of hybrid machining?
a) Ultrasonic Machining
b) Electron Beam Machining
c) Ultrasonic assisted electrochemical machining
d) Laser Beam Machining
Answer____

13. Of the following scientists, who discovered USM?
a) Balamuth
b) Paul O Flawer
c) Turing
d) Steve John
Answer____

14. What is the full form of USM in advanced machining process?
a) Ultrasound manufacturing
b) Ultrasonic machining
c) UV spectrum manufacturing
d) Ultra sonar machining
Answer____

15. USM removes materials using ____ tool?
a) Perpendicularly rotating
b) Perpendicularly oscillating
c) Axially oscillating
d) Inclined oscillating
Answer____

16. Which is softer material in USM?
a) Tool
b) Work piece
c) Both of them
d) None of the mentioned
Answer____

17. Frequency of tool's oscillation in USM ranges between?
a) 5-10 kHz
b) 10-15 kHz
c) 18-20 kHz

d) 25-50 kHz
Answer____

18. Amplitude of oscillation of tool in USM ranges between?
a) 0.1-10 μm
b) 10-40 μm
c) 50-100 μm
d) 100-1000 μm
Answer____

19. In which year, discovery of USM took place?
a) 1910
b) 1925
c) 1943
d) 1945
Answer____

20. The machining system of USM contains which of the following components?
a) Magnetostrictor
b) Concentrator
c) Tools and slurry
d) All of the mentioned
Answer____

21. State whether following statement is true or false.
"In Ultrasonic Machining, Magnetostrictor is energized at ultrasonic frequency."
a) True
b) False
Answer____

22. Of the following scientists, who discovered magnetostrictor effect?
a) Balamuth
b) Steve O Flawer
c) Joule
d) Turing
Answer____

23. In Ultrasonic Machining, magnetostrictor converts magnetic energy into which type of energy?
a) Mechanical energy
b) Electrical energy
c) Thermal energy

d) None of the mentioned
Answer____

24. What is the value of the amplitude obtained without mechanical amplifier?
a) 0.0001 – 0.001 μm
b) 0.001 – 0.1 μm
c) 1 – 10 μm
d) 10 – 100 μm
Answer____

25. What is the value of the amplitude obtained when we use mechanical amplifier?
a) 1 – 10 μm
b) 10 – 40 μm
c) 40 – 50 μm
d) 50 – 100 μm
Answer____

26. State whether the following statement is true or false.
"In USM, tool tips must have low resistance and fatigue strength."
a) True
b) False
Answer____

27. At what rate slurry is pumped through nozzle in USM?
a) 10 L/min
b) 25 L/min
c) 50 L/min
d) 75 L/min
Answer____

28. By which of the following means, material is removed in USM?
a) Mechanical abrasion
b) Microchipping
c) Cavitation
d) All of the mentioned
Answer____

29. What is the percentage of contribution of cavitation to the total material removed?
a) <5%
b) 5 – 10 %
c) 10 – 20 %
d) 20 – 50 %
Answer____

30. The following mechanisms, which one is dominant in material removal?
a) Hammering
b) Cavitation
c) Microchipping
d) None of the mentioned
Answer____

31. When machining porous material, which type of mechanism is introduces?
a) Abrasion
b) Erosion
c) Corrosion
d) Vaporization
Answer____

32. The rate of material removal depends on which of the following features?
a) Frequency
b) Static Pressure
c) Machining area
d) All of the mentioned
Answer____

33. State whether following statement is true or false.
"The machinability of USM depends on brittleness criterion."
a) True
b) False
Answer____

34. Which of the following are the features of tool affecting MRR in USM?
a) Hardness
b) Wearability
c) Accuracy
d) Mounting
Answer____

35. What is the machinability rate of glass by USM?
a) 25%
b) 50%
c) 75%
d) 100%
Answer____

36. What happens to MRR with increase in tool amplitude?
a) Increases

b) Decreases
c) Remains same
d) None of the mentioned
Answer____

37. The vibration amplitude determines, which parameter of the abrasive particles?
a) Force
b) Torque
c) Velocity
d) Pressure
Answer____

38. State whether the statement is true or false.
"If splashing occurs, it will result in the increase of material removal rate in USM."
a) True
b) False
Answer____

39. Amplitude of the oscillation ranges between which of the following values?
a) 0.01 – 0.04 mm
b) 0.04 – 0.08 mm
c) 0.08 – 0.10 mm
d) 0.10 – 0.20 mm
Answer____

40. As the vibration frequency increases, what happens to material removal rate?
a) Decreases
b) Increases
c) Increase and then decrease
d) Decrease and then increase
Answer____

41. Of the following, which one can be used as abrasive carrying medium?
a) Water
b) Benzene
c) Glycerol
d) All of the mentioned
Answer____

42. If there is an increase in viscosity of slurry, what happens to MRR?
a) Increases
b) Decreases
c) Remains same

d) None of the mentioned
Answer____

43. How much percent of the abrasives are recommended in general for abrasive medium?
a) 10 – 15 %
b) 15 – 20 %
c) 25 – 30 %
d) 30 – 35 %
Answer____

44. State whether the following statement is true or false.
“Machining rate can be affected by the ratio of hardness of tool to that of hardness of work piece.”
a) True
b) False
Answer____

45. As the tool area increases, what happens to MRR?
a) Decreases
b) Increases
c) Remains same
d) None of the mentioned
Answer____

46. When the static pressure of the feed is increases, what happens to MRR?
a) Increases
b) Decreases
c) Increase up to a limiting condition
d) Decrease up to a limiting condition
Answer____

47. What is the full form of WJM in advanced machining processes?
a) Water Jack Manufacturing
b) Water Jet Machining
c) Water Jet Manufacturing
d) Water Jack Manufacturing
Answer____

48. What is the key element of water jet machining for material removal?
a) Tool Holder
b) Work piece
c) Water jet

d) Power source
Answer____

49. What is the velocity of water jet stream in water jet machining?
a) 100 m/sec
b) 300 m/sec
c) 700 m/sec
d) 900 m/sec
Answer____

50. Which of the following is not a part of machining system of Water jet machining?
a) Transducer
b) Accumulator
c) Jet cutting nozzle
d) Hydraulic pump
Answer____

51. What is the general power rating of the hydraulic pump, used in WJM?
a) 10 kW
b) 20 kW
c) 30 kW
d) 40 kW
Answer____

52. Which of the following are the components of intensifier present in water jet machining system?
a) Piston
b) Plunger
c) Limit switch
d) All of the mentioned.
Answer____

53. Intensifier increases the pressure water by which of the following values?
a) 10 – 100 MPa
b) 100 – 200 MPa
c) 200 – 400 MPa
d) 400 – 1000 MPa
Answer____

54. On which property of water, will the accumulator in Water jet machining rely on?
a) Density
b) Compressibility
c) Viscosity

d) Velocity
Answer____

55. What are the values of typical tube diameters in the machining system in WJM?
a) 0.1 to 1 mm
b) 1 to 6 mm
c) 6 to 14 mm
d) 14 to 25 mm
Answer____

56. What is the expected life of the nozzles used in WJM?
a) 10 hrs
b) 20 hrs
c) 100 hrs
d) 200 hrs
Answer____

57. Which of the following does not damage the nozzle used in Water jet machining?
a) Particles of dirt
b) Mineral deposits
c) Water
d) All of the mentioned
Answer____

58. What are the uses of catcher in machining system of Water jet machining?
a) Collecting dirt
b) Collection of debris
c) Reduce noise levels
d) All of the mentioned
Answer____

59. Distance between which components, is the stand-off distance?
a) Nozzle-inlet and work piece top
b) Nozzle-outlet and work piece-top
c) Nozzle-inlet and work piece-bottom
d) Nozzle-outlet and work piece-bottom
Answer____

60. What is the value of diameter of the jet cutting nozzle in WJM?
a) 0.01 – 0.1 mm
b) 0.1 – 0.3 mm
c) 0.3 – 0.7 mm

d) 0.7 – 1.5 mm
Answer____

61. What is the value of stand-off distance in Water jet machining?
a) 0.1 – 1 mm
b) 1 – 2 mm
c) 2 – 6 mm
d) 6 – 14 mm
Answer____

62. What are the values of jet velocities in Water jet machining?
a) 100 – 200 m/s
b) 200 – 500 m/s
c) 500 – 1500 m/s
d) 1500 – 3000 m/s
Answer____

63. State whether the following statement is true or false.
"As the pump pressure increases, depth of cut decreases in Water jet machining."
a) True
b) False
Answer____

64. What is the value of material thickness of work piece in WJM?
a) 0.001 – 0.25 mm
b) 0.8 – 25 mm
c) 50 – 100 mm
d) 100 – 500 mm
Answer____

65. What is the value of feed rate in Water Jet Machining?
a) 0.0001 – 0.025 m/min
b) 0.05 – 0.25 m/min
c) 0.5 – 200 m/min
d) 200 – 500 m/min
Answer____

66. In WJM, what are the properties of jet fluid that affect the MRR?
a) Velocity
b) Flow rate
c) Viscosity
d) All of the mentioned
Answer____

67. Which of the following property/ies of nozzle does not affect the material removal rate in Water jet machining?
a) Material
b) Diameter
c) Outside temperature
d) Stand-off distance
Answer____

68. In the following materials, Water jet machining can be used on which type of material?
a) Metals
b) Plastics
c) Ceramics
d) All of the mentioned
Answer____

69. What are the processes and applications, where Water jet machining can be used?
a) Cutting
b) Drilling
c) Deburring
d) All of the mentioned
Answer____

70. What are the tolerance limits range of thin materials in WJM?
a) ± 0.1 mm
b) ± 10 mm
c) ± 25 mm
d) ± 50 mm
Answer____

71. In cutting of rocks using water jet machining, which type of pressure is needed?
a) Low pressure
b) Medium pressure
c) High pressure
d) None of the mentioned
Answer____

72. In deburring, which combination removes the material from non-metallic materials?
a) High pressure and low flow rate
b) High pressure and high flow rate
c) Low pressure and low flow rate
d) Low pressure and high flow rate
Answer____

73. Which of the following materials has some drawbacks of cutting WJM?
a) Food
b) Rocks
c) Fibre-reinforced plastics
d) None of the mentioned
Answer____

74. What is the accuracy level obtained when PCB's are cut by WJM?
a) ± 0.05 mm
b) ± 0.13 mm
c) ± 0.26 mm
d) ± 0.33 mm
Answer____

75. In WJM, surface treatment includes which type of processes?
a) Removing deposits
b) Removing chemicals
c) Degreasing
d) All of the mentioned
Answer____

76. Which of the following is not the feed mechanism of the abrasives in AWJM?
a) Side feed
b) Cross feed
c) Central feed
d) All of the mentioned
Answer____

77. In Abrasive water jet machining, how are the abrasives fed into the water jet stream?
a) Suspension
b) Injection
c) All of the mentioned
d) None of the mentioned
Answer____

78. What is the use of delivery system in the machining system of AWJM?
a) To deliver colloidal solution
b) To pump water
c) To fed abrasives
d) None of the mentioned
Answer____

79. Of the following components, which one does not come under the machining system of AWJM?
a) Water delivery system
b) Transducer
c) Cutting nozzles
d) Mixing chambers
Answer____

80. In Abrasive water jet machining, intensifier is used to deliver which type of pressure?
a) Very low pressure
b) Low pressure
c) Medium pressure
d) High pressure
Answer____

81. In mixing chamber of AWJM, which of the following are mixed?
a) Abrasives and colloidal solution
b) Abrasives and water jet
c) Colloidal and water jet
d) None of the mentioned
Answer____

82. Of the following, which one is a type of suspension in AWJM?
a) Direct pumping
b) Indirect pumping
c) Bypass pumping
d) All of the mentioned
Answer____

83. In machining system of AWJM, mixing chamber is immediately followed by which of the following component?
a) Focusing tube
b) Cutting Nozzle
c) Intensifier
d) Water delivery
Answer____

84. Which of the following energies are absorbed using the catchers in Abrasive water jet machining?
a) Pressure energy
b) Kinetic energy of abrasives
c) Residual energy

d) All of the mentioned
Answer____

85. Which of the following are different types of catchers used in AWJM?
a) Water basin type
b) Submerged steel balls type
c) TiB2 type
d) All of the mentioned
Answer____

86. Which of the following is not a process parameter of Abrasive water jet machining?
a) Frequency of vibration
b) Orifice diameter
c) Pressure
d) Stand-off distance
Answer____

87. Which of the following come under the process parameters of the Abrasive water jet machining?
a) Abrasive size
b) Machine impact angle
c) Traverse speed
d) All of the mentioned
Answer____

88. What is the value of orifice diameter in Abrasive water jet machining?
a) 0.01 – 0.03 mm
b) 0.03 – 0.09 mm
c) 0.10 – 0.30 mm
d) 0.30 – 0.90 mm
Answer____

89. Of the following values, between which of them pressure value will range?
a) 1000 – 1500 bar
b) 1500 – 2500 bar
c) 2500 – 4000 bar
d) 4000 – 10000 bar
Answer____

90. When compared to sand, how much effective is garnet as abrasive material in AWJM?
a) 20%
b) 30%
c) 40%

d) 50%
Answer____

91. State whether following statement is true or false about Abrasive water jet machining.
“A material, whose material removal rate is higher, produces larger surface roughness.”
a) True
b) False
Answer____

92. Surface roughness depends on which of the following parameters in Abrasive water jet machining?
a) Work piece material
b) Grit size
c) Abrasive type
d) All of the mentioned
Answer____

93. What is the value of focusing diameter in Abrasive water jet machining?
a) 0.1 – 0.6 mm
b) 0.8 – 1.4 mm
c) 1.6 – 2.8 mm
d) 3.2 – 5.2 mm
Answer____

94.In how many directions, can the cutting takes place in Water jet machining?
a) Uni-directional
b) Bi-directional
c) Multi-directional
d) None of the mentioned
Answer____

95. In Water jet machining, cuts can be started at which place of work piece?
a) From left
b) From right
c) From middle
d) From any point
Answer____

96. State whether following statement is true or false.
“To start the cuts in Water jet machining, pre-drilled holes are not necessary.”
a) True
b) False
Answer____

97. Which of the following is not an advantage of Water jet machining?
a) Burr produced is minimal
b) No Heat is produced
c) Relatively low hourly rates
d) Environmentally safe
Answer____

98. State whether following statement is true or false.
“In Water jet machining, tool need not require sharpening once the machining is done.”
a) True
b) False
Answer____

99. Which of the following secondary processes are eliminated in Water jet machining?
a) Grinding of surface
b) Surface treatment
c) Polishing of surface
d) All of the mentioned
Answer____

100. How many parts are cut using Water jet machining, on a single blank?
a) One part
b) Two parts
c) Three parts
d) Multiple parts
Answer____

1. D
2. B
3. D
4. D
5. A
6. D
7. A
8. D
9. D
10. A
11. A
12. C
13. A
14. B
15. C

16. A
17. C
18. B
19. D
20. D
21. A
22. C
23. A
24. B
25. C
26. B
27. B
28. D
29. A
30. A
31. B
32. D
33. A
34. D
35. D
36. A
37. C
38. B
39. B
40. C
41. D
42. B
43. D
44. A
45. A
46. C
47. B
48. C
49. D
50. A
51. C
52. D
53. C
54. B
55. C
56. D
57. C
58. D
59. B

60. B
61. C
62. C
63. B
64. B
65. C
66. D
67. C
68.
69.
70.
71.
72.
73.
74.
75.
76. B
77. C
78. B
79. B
80. D
81. B
82. D
83. A
84. C
85. D
86. A
87. D
88. C
89. C
90. B
91. A
92. D
93. B
94. C
95. D
96. B
97. C
98. A
99. D
100. D

HIGH VELOCITY FORMING AND SUPERPLASTIC FORMING

1. Which of the following process is called as high rate energy forming
   a) Explosive forming
   b) Electron beam cutting
   c) Redrawing
   d) Shear spinning
2. The desirable material for HERF
   a) Brittle
   b) Ductile
   c) Viscoelastic
   d) Viscoplastic
3. The velocity range for HERF process is
   a) 0.03 m/s
   b) 0.24 to 4.2 m/s
   c) 20 to 228 m/s
   d) 0.03 to 0.73 m/s
4. In HERF process
   a) Large amount of energy is applied for a very short interval of time
   b) Small amount of energy is applied for a very short interval of time
   c) Large amount of energy is applied for a very large interval of time
   d) Small amount of energy is applied for a very large interval of time
5. Spring back effect in HERF is
   a) Large
   b) Small
   c) Negligible
   d) None of above
6. Which statement is correct for HERF
   a) Die costs are relatively lower
   b) No or minimum spring back effect on the material after the process
   c) Complex shapes / profiles can be made much easily, as compared to conventional forming
   d) All of above
7. Standoff method is applied in which HERF process
   a) Explosive Forming
   b) Magnetic pulse forming
   c) ELECTRO HYDRAULIC FORMING
   d) Rubber pad forming
8. In which method, the explosive charge is held in direct contact with the work piece while the detonation is initiated
   a) Standoff method
   b) Rubber pad method
   c) Contact method

d) None of the above

9. In which forming process punch or press is used to form metal sheet forming
   a) Stretch forming
   b) Explosive forming
   c) Hydro forming
   d) Super plastic forming
10. In explosive forming
   a) Preheating of workpiece is required
   b) Preheating of workpiece is not required
   c) May be or may not be Preheating of workpiece is required
   d) None of the above
11. Which forming process is used for bending continuous lengths of sheet metal and for large production runs
   a) Roll forming
   b) Stretch forming
   c) Explosive forming
   d) Hydro forming
12. In roll forming process
   a) A series of rollers are used
   b) Heavy rollers are used
   c) Cluster rollers are used
   d) Planetary rollers are used
13. In which forming process one of the dies in a set is made of flexible material
   a) Rubber forming
   b) Explosive forming
   c) Roller forming
   d) Hydro forming
14. Flexible material used in rubber forming for making die is
   a) Rubber
   b) Polyurethane
   c) Both a and b
   d) Polystyrene
15. Polyurethanes are used widely because of
   a) Long fatigue life
   b) Resistance to abrasion
   c) Resistance to damage by burrs or sharp edges
   d) All of above
16. Which forming process is used to fabricate aircraft wings
   a) Rubber forming
   b) Explosive forming
   c) Stretch forming
   d) Super plastic forming
17. An explosive that normally detonates is known as

a) A high explosive
b) A low explosive
c) Secondary explosive
d) Primary explosive

18. Which one of the following is a definition of a detonation?
    a) A type of chemical explosion in which the speed at which the reaction front moves through the explosive is less than the speed of sound in that material.
    b) The name given to any explosion that occurs in a condensed explosive.
    c) A type of chemical explosion in which the speed at which the reaction front moves through the explosive is greater than the speed of sound in that material.
    d) A small explosion used to set off a main charge of explosive.
19. Cold working of steel takes place at a temperature below 823°C.
    a) True
    b) False
20. The important material property in all metal forming process is
    a) Elasticity
    b) Ductility
    c) Plasticity
    d) Brittleness

THEORY OF PLASTICITY State of stress - Stress tensor - Engineering stress strain relationship - Flow curve - True stress and true strain - Yield criteria - Slip line field theory - Plastic work - Plastic anisotropy
FUNDAMENTALS OF METAL WORKING Flow stress determination, Temperature in metal working, Strain rate effects, Hot, cold and warm working, Metallurgical structure, Friction and lubrication, Hydrostatic pressure, Workability Residual stresses, deformation processing system

1	Depending upon the temperature the forming process can be classified as? A. Hot working B. Cold working C. Warm working D. All of the mentioned
2	If Tm is the melting temperature then in hot working the value of Tm is? A. .5 Tm B. .6Tm C. .4 Tm D. .7Tm
3	In which of the following process no strain hardening is produced? A. Hot working B. Cold working C. Warm working D. None of the mentioned
4	During hot working the Grain Growth can takes place in which part of the material?

	A. Exterior B. Interior C. Along the edges D. Side faces
5	Which of the defect is eliminated by hot working process? A. Cold shut B. Misrun C. Blow holes D. Fusion
6	The working temperature of cold working is below a certain temperature. That temperature is known as? A. Critical temperature B. Re crystallization temperature C. Transition temperature D. None of the mentioned
7	In which of the following process the ductility of material decreases? A. Hot working B. Cold working C. Warm working D. None of the mentioned
8	Which of the following statement is true about cold working? A. Strain hardening is relieved B. No oxidation occur C. Only limited amount of reduction can be done D. Cost of machining is high
9	In which of the following process plastic deformation takes place? A. Hot working B. Cold working C. Warm working D. Rolling ANSWER: C
10	In metal forming process the hardness of the material? A. Decreases B. Remains same C. Increases then decreases D. Increases ANSWER: D
11	The work involved with the internal shearing process due to non-uniform deformation is? A. Ideal work B. Frictional work C. Redundant work D. None of the mentioned ANSWER: C
12	Which of the following method is used for analyzing metal forming processes? A. Slab method B. Upper bound method C. Slip line method D. All of the mentioned ANSWER: D
13	Which of the following method is commonly used for analyzing metal forming processes? A. Slab method

	B. Upper bound method C. Slip line method D. None of the mentioned ANSWER: A
14	Warm working is done at a temperature? A. Above re crystallization temperature B. Below re crystallization temperature C. Equal to re crystallization temperature D. Below re crystallization temperature and above room temperature ANSWER: D
15	Which process got a better dimensional accuracy? A. Hot working B. Cold working C. Warm working D. Both Hot and Cold working ANSWER: A
16	Good surface finish and better dimensional accuracy can be achieved in A. cold working process B. hot working process C. both A. and B. D. none of the mentioned ANSWER: A
17	Mechanical working processes are performed on metals A. to achieve optimum mechanical properties in the metal B. to improve the mechanical strength of the metal C. to make metal dense D. None of the mentioned ANSWER: D
18	Hot working process is the plastic deformation of metal which is carried out A. at temperature below the recrystallisation temperature B. at temperature above the recrystallisation temperature C. at temperature equals to boiling point of water D. none of the above ANSWER: B
19	Which of the following are the cold working processes? (1) Forging (2) Bending (3) Squeezing (4) Pipe Welding (5) Drawing A. (1), (2) and (3) B. (2), (3) and (5) C. (2), (4) and (5) D. (1), (2), (3) and (5) ANSWER: B
20	Worm working or semi-hot working process, which is the plastic deformation of metal or alloy under conditions of temperature and strain rate, is performed to eliminate drawbacks of

	A. cold working process B. hot working process C. both cold and hot working processes D. none of the above ANSWER: C
21	The volume of metal that enters the rolling stand A. should increase after rolling process B. should decrease after rolling process C. should remain same after rolling process D. unpredictable ANSWER: C
22	Which characteristic of material is used in forging process? A. Characteristics of elasticity of material B. Characteristics of ductility of material C. Characteristics of plasticity of material D. None of the mentioned ANSWER: C
23	How does the ability of material to withstand unpredictable loads change after forging? A. The ability of material to withstand unpredictable loads increases after forging B. The ability of material to withstand unpredictable loads decreases after forging C. The ability of material to withstand unpredictable loads does not change after forging D. Unpredictable ANSWER: B
24	Castings are usually A. Costlier than forgings B. Cheaper than forgings C. At the same rate as forging for similar metal D. Unable to predict ANSWER: B
25	**The deformation per unit length is called** A. Strain B. Stress C. Elasticity D. Posion ratio ANSWER: A
26	**The ability of the material to deform without breaking is called** A. Elasticity B. Plasticity C. Creep D. Fatique ANSWER: B
27	**Which of the following material is more elastic?** A. Rubber B. Glass C. Steel D. Wood ANSWER: C

28	**The percentage elongation and the percentage reduction in area depends upon** A. Tensile strength of the material B. Ductility of the material C. Toughness of the material D. Hardness of the material ANSWER: B
29	**The property of a material by which it can be beaten or rolled into thin sheets, is called** A. Elasticity B. Plasticity C. Ductility D. Malleability ANSWER: D
30	**A bar of square cross section of side 'a' is subjected to a tensile load P on a plane inclined at 45 degree to the axis of the bar, the normal stress will be.** A. $\frac{P}{a^2}$ B. $\frac{P}{2a^2}$ C. $\frac{2P}{a^2}$ D. $\frac{P}{4a^2}$ ANSWER: **B**
31	**A load of 1 kN acts on a bar having cross-sectional area 0.8 cm^2 and length 10 cm. The stress developed in the bar is** A. $12.5\ N/mm^2$ B. $25\ N/mm^2$ C. $50\ N/mm^2$ D. $75\ N/mm^2$ ANSWER: A
32	**A steel bar 100 mm long is subjected to a tensile stress σ .If the change in length of the bar is $\frac{1}{20}$ mm, what will be the value of σ? E for steel $= 2 \times 10^5\ N/mm^2$.**

	A. $25\ N/mm^2$ B. $50\ N/mm^2$ C. $75\ N/mm^2$ D. 100 N/mm^2 ANSWER: D
33	**The property of a material by which it can be drawn to a smaller section by applying a tensile load is called** A. Elasticity B. Plasticity C. Ductility D. Malleability ANSWER: C
34	**If a material has identical properties in all directions, it is called** A. Elastic B. Plastic C. Isotropic D. Homogeneous ANSWER: C
35	**The stress at which extension of a material takes place more quickly as compared to increase in load, is called** A. No elastic zone B. Plastic point C. Yield point D. Breaking point ANSWER: C
36	**A brittle material has** A. No elastic zone B. No plastic zone C. Large plastic zone D. smaller plastic zone ANSWER: B
37	**Every material obeys the Hooke's law within** A. Elastic limit B. Plastic limit C. Limit of proportionality D. Upper limit ANSWER: C
38	**Units of strain** A. cm/cm B. m/m

	C. N/cm^2 D. No unit ANSWER: D
39	**The increase in the length of a bar of length *l* area A, modulus of elasticity E due to a tensile load P is given by** A. $\frac{Pl}{A^2E}$ B. $\frac{Pl}{AE}$ C. $\frac{PlA}{E}$ D. $\frac{AE}{Pl}$ ANSWER: B
40	**The ratio of lateral strain to linear strain is called** A. Modulus of Elasticity B. Modulus of Rigidity C. Bulk Modulus D. Poisson's Ratio ANSWER: D
41	**Dimensional formula for Young's modulus of elasticity is** A. $ML^{-1}T^2$ B. MLT^2 C. $M^{-1}L^{-1}T^{-1}$ D. $ML^{-2}T^{-2}$ ANSWER: A
42	**A perfectly elastic body** A. Can move freely B. Has perfectly smooth surface C. Is not deformed by any external surface D. Recovers its original size and shape when the deforming force is remove. ANSWER: D

43	**The value of Poison's ratio depends upon** A. Nature of load, tensile or compressive B. Magnitude of load C. Material of the test specimen D. Dimensions of the test specimen ANSWER: C
44	**When a section is subjected to two equal and opposite forces tangentially to the section, the stress produced is known as** A. Tensile stress B. Lateral stress C. Shear stress D. No stress ANSWER: C
45	**Which of the following is a dimensionless quantity?** A. Shear stress B. Poison's ratio C. Strain D. Both B. and C. ANSWER: D
46	**Percentage elongation during tensile test is indication of** A. Ductility B. Malleability C. Creep D. Rigidity ANSWER: A
47	**Brittleness is opposite to** A. Toughness B. Plasticity C. Malleability D. elasticity ANSWER: B
48	**The statement : stress is proportional to strain, i.e. the Hooke's law holds good upto** A. Elastic Limit B. Proportional Limit C. Plastic Limit D. Yield point ANSWER: B
49	**The limit beyond which the material does not behave elastically is known as** A. Proportional limit B. Elastic limit C. Plastic limit D. Yield Point ANSWER: B
50	**When mild steel is subjected to a tensile load, its fracture will conform to** A. Star shape B. Granular shape C. Cup and cone shape D. Fibrous shape

	ANSWER: C
51	**When a wire is stretched to double in length, the longitudinal strain produced in it is** A. 0.5 B. 1.0 C. 1.5 D. 2.0 ANSWER: B
52	**The length of a wire is increased by 1 mm on the application of a certain loaD. In a wire of the same material but of twice the length and half the radius, the same force will produce an elongation of** A. 0.5 mm B. 2 mm C. 4 mm D. 8 mm ANSWER: D
53	**A cylindrical rod of length *l* and diameter *d* is rigidly fixed at its upper end and hangs vertically. The elongation produced in the rod due to its self weight W is** A. *wl/AE* B. *wl/2AE* C. *3wl/AE* D. *3wl/2AE* ANSWER: B
54	**The Young's modulus E, the shear modulus G and the Poisson's ratio μ for a material are related by the expression** A. $E = 2G(1+\mu)$ B. $E = 3G(1-\mu)$ C. $E = 3G(1-2\mu t)$ D. $E = 3G(1+2\mu)$ ANSWER: A
55	**The elastic constant E, G and K are related by the expression** A. $E = \frac{GK}{2K+G}$ B. $E = \frac{2GK}{2K+G}$ C. $E = \frac{3GK}{K+2G}$

	D. $E = \frac{9GK}{3K+G}$ ANSWER: D
56	**The independent elastic constants for a homogeneous and isotropic material are** A. E, G, K, μ B. E, G, K C. F, G D. E, K ANSWER: A
57	**When a bar is subjected to a change of temperature and its longitudinal deformation is prevented, the stress induced in the bar is** A. Tensile B. Compressive C. Shear D. Temperature ANSWER: D
58	**When a bar is subjected to increase in temperature and its deformation is prevented, the stress induced in the bar is** A. Tensile B. Compressive C. Shear D. None of the above ANSWER: B
59	**In a composite body, consisting of two different materials……..will be same in both materials.** A. Stress B. Strain C. Both stress and strain D. None of stress and strain ANSWER: B
60	Time dependent permanent deformation is called _____. A. Plastic deformation B. Elastic deformation C. Creep D. Anelastic deformation ANSWER: C
61	Figure-out the odd point in the following A. Proportinal limit B. Elastic limit C. Yeild point D. Fracture point

	ANSWER: D
62	If a material is subjected to two incremental true strains namely ε_1 and ε_2, then the total true strain is A. $\varepsilon_1 * \varepsilon_2$ B. $\varepsilon_1 - \varepsilon_2$ C. $\varepsilon_1 + \varepsilon_2$ D. $\varepsilon_1 / \varepsilon_2$ ANSWER: C
63	Engineering stress-strain curve and True stress-strain curve are equal up to A. Proportional limit B. Elastic limit C. Yeild point D. Tensile strength point ANSWER: C
64	Value of Poisson's ratio for ionic solids in the range of A. 0.1 B. 0.2 C. 0.3 D. 0.4 ANSWER: B
65	Hydrostatic stress results in the following A. Linear strain B. Shear strain C. Both linear and shear strains D. None of the mentioned ANSWER: D
66	High elastic modulus in materials arises from A. High strength of bonds B. Weak bonds C. combination of bonds D. None ANSWER: A
67	Change in elastic modulus for ordinary materials between 0K and melting point is A. 10-20% increase B. 10-20% decrease C. 80-90% decrease D. 80-90% increase ANSWER: B
68	Bauschinger effect A. Hysteresis loss during loading and unloading B. Anelastic deformation C. Dependence of yield stress on path and direction D. None ANSWER: C
69	Shape of true stress-strain curve for a material depends on A. Strain B. Strain rate C. Temperature D. All

70	Shape of true stress-strain curve for a material depends on A. Strain B. Strain rate C. Temperature D. All
71	True stress-strain curve need to be corrected after A. Elastic limit B. Yield limit C. Tensile strength D. no need to correct
72	Following condition represents onset of necking A. $\varepsilon_U = n$ B. $\varepsilon_U = 1-n$ C. $\varepsilon_U = 1+n$ D. $\varepsilon_U = ln\ (1+n)$
73	As compared with conventional stress-strain curve, the true stress-strain curve is A. Above and right B. Below and right C. Above and left D. Below and left
74	According to distortion-energy criterion, yielding occurs when A. Distortion energy reaches a critical value B. Second invariant of the stress deviator exceeded some critical value C. Octahedral shear stress reaches a critical value D. All
75	von Mises and Tresca criteria give different yield stress for A. Uni-axial stress B. Balanced bi-axial stress C. Pure shear stress D. All
76	Plastic deformation results from the following A. Slip B. Twinning C. Both D. None
77	Time dependent recoverable deformation under load is called _____ deformation. A. Elastic B. Anelastic C. Elastic after-effect D. Visco-elastic