103

QUESTION BOOKLET

Post: Jr. Engineer (Mechanical)

INSTRUCTIONS

Q.B. Number:

Roll Number: | | | | | | | | | | |

Q.B. Series: B

Please read the following instructions carefully.

1) Mark carefully your Roll Number, Question Booklet Number and series of the paper on the OMR Answer Sheet and sign at the appropriate place. Write your Roll number on the question booklet.

2) Strictly follow the instructions given by the Centre Supervisor / Room invigilator and those given on the Question Booklet. Please ensure you fill all the required details and shade the bubbles correctly on the OMR Answer Sheet.

3) Please mark the right responses ONLY with Blue/Black ball point pen. USE OF PENCIL AND GEL-PEN IS NOT ALLOWED.

4) Candidates are not allowed to carry any papers, notes, books, calculators, cellular phones, scanning devices, pagers etc. to the Examination Hall. Any candidate found using, or in possession of such unauthorized material, indulging in copying or impersonation or adopting unfair means, is liable to be summarily disqualified and may be subjected to penal action.

5) After finishing the examination, hand over the complete question booklet and the OMR Answer Sheet. DO NOT carry the question booklet or any part of it, outside the examination room. Doing so, is a punishable offence.

6) The test is of objective type. This Question Booklet contains a total of 150 questions and the total time allotted is 2 hours 30 minutes.

7) Each objective question is followed by four responses. Your task is to choose the correct response and mark your response on the OMR Answer Sheet and NOT on the Question Booklet.

8) All questions are compulsory. There will be no NEGATIVE MARKING.

9) For each answer as shown in the example below. The CORRECT and the WRONG method of darkening the CIRCLE on the OMR sheet are given below.

Correct Method

Wrong Method

10) In view of the tight time span, do not waste your time on a question which you find to be difficult. Go on solving questions one by one and come back to the difficult questions at the end.

11) DO NOT make any stray marks anywhere on the OMR Answer Sheet. DO NOT fold or wrinkle the OMR Answer Sheet. Rough work MUST NOT be done on the answer sheet. Use your question booklet for this purpose.

1. In electro-discharge machining, the tool and work piece are submerged in
   (A) Kerosene oil
   (B) Sulfuric acid
   (C) Aluminium slurry
   (D) Nitric acid
2. Bernoulli's Equation is obtained by
   (A) Integration of Euler's Equation
   (B) Differentiation of Euler's Equation
   (C) Double differentiation of Euler's Equation
   (D) Newton's law of motion
3. If the value of A2 is given as 0.52, R = 2, X-bar = 2, the UCL of the X-bar chart will be
   (A) 0.96
   (B) 3.04
   (C) 3.48
   (D) 0.52
4. Chaplet is used to
   (A) Increase the cooling rate of molten metal
   (B) Decrease the cooling rate of molten metal
   (C) Compensate the shrinkage
   (D) Support the core
5. Drilled holes and honed holes could be designated by which of the following grades?
   (A) H_5, H_{11}
   (B) H_6, H_{10}
   (C) H_8, H_6
   (D) H_{10}, H_5
6. Which of the following plant layout is most suitable for automobile manufacturing units?
   (A) Product layout
   (B) Process layout
   (C) Fixed position layout
   (D) Group layout
7. Which property of a material can be rolled into sheets?
   (A) Plasticity
   (B) Elasticity
   (C) Malleability
   (D) Ductility
8. In case of laminar flow, the loss of pressure head is proportional to:
   (A) Velocity
   (B) Square of velocity
   (C) Cube of velocity
   (D) Half of velocity
9. What is the temperature range of delta iron?
   (A) 0^0 C to 768^0 C
   (B) 768^0 C to 900^0 C
   (C) 900^0 C to 1400^0 C
   (D) 1400^0 C to 1530^0 C
10. What is the angle between the direction of follower motion and normal to the pitch curve known as?
    (A) Pitch angle
    (B) Prime angle
    (C) Pressure angle
    (D) Base angle
11. If the actual demand of a product is 62, a previous year's forecast is 57, and the value of smoothing constant is 0.3, what would be the forecast for the current year using exponential smoothing method of forecasting?
    (A) 58.5
    (B) 60
    (C) 62.5
    (D) 65
12. In the case of capillarity, the rise or fall of head 'h' in a capillary tube of diameter 'd', liquid surface tension 'σ' and specific weight w is given by
    (A) 4σ/wd
    (B) 4dσ/w
    (C) 4wd/σ
    (D) 4d/σw

13. Cavitation begins when
    (A) The pressure is increased rapidly
    (B) The Flow is increased suddenly
    (C) The pressure becomes more than the critical pressure
    (D) The pressure falls below its vapour pressure and sudden bursting the bubble in high pressure zone
14. Maximum fluctuation of energy is the
    (A) Sum of maximum and minimum energies
    (B) Difference between maximum and minimum energies
    (C) Ratio of maximum and minimum energies
    (D) Ratio of mean resisting torque to the work done per cycle
15. Weight of a beam is an example of
    (A) Concentrated load
    (B) Uniformly distributed load
    (C) Linearly varying load
    (D) Varying load
16. Which property is needed for materials, used in tools and machines?
    (A) Plasticity
    (B) Ductility
    (C) Elasticity
    (D) Malleability
17. Bernoulli’s theorem for liquid is applicable for which of the following?
    (A) Viscous fluids
    (B) Incompressible fluids
    (C) Compressible fluids
    (D) Turbulent flow
18. The volumetric efficiency of naturally aspirated engines ranges between
    (A) 20-30 %
    (B) 75-85 %
    (C) 50-60%
    (D) 95-100 %
19. When a body of mass' m 'attains a velocity' v 'from rest in time' t ',then kinetic energy of translation is:
    (A) mv^2
    (B) mgv^2
    (C) $0.5\ mv^2$
    (D) $0.5\ mgv^2$
20. A load of 20,000Kg applied to a brass cylinder 40cm long & 10cm in diameter caused the length to increase 0.8cm & diameter to decrease 0.005cm. Poisson's ratio of brass is:
    (A) 0.25
    (B) 0.4
    (C) 2.5
    (D) 4
21. Which of the following defects occurs due to slag inclusion in casting process?
    (A) Line defect
    (B) Surface defect
    (C) Internal defect
    (D) Superficial defect
22. Which of the following is an example of a pendulum type governor?
    (A) Hartnell governor
    (B) Porter governor
    (C) Pickering governor
    (D) Watt governor
23. Which of the following fluids obeys the equation, $\mu = \tau/(du/dy)$?
    (A) Perfect fluid
    (B) Real fluid
    (C) Newtonian fluid
    (D) Plastic fluid
24. Which of the following is added to aluminium to increase its casting ability?
    (A) Copper
    (B) Magnesium
    (C) Silicon
    (D) Lead and Bismuth

25. For optimum level of quality, which of the following cost should be minimum?
(A) Direct cost
(B) Indirect cost
(C) Appraisal cost
(D) Total cost

26. A high speed diesel engine theoretically operates on
(A) Constant temperature cycle
(B) Constant pressure cycle
(C) Constant entropy cycle
(D) Mixed cycle of constant pressure and constant volume

27. Isochronism in a governor is desirable when
(A) The engine operates at low speed
(B) The engine operates at high speed
(C) The engine operates at variable speed
(D) One speed is desired under one load

28. The process capability indicates that the product produced will be in the range of
(A) $\pm\sigma$ limits
(B) $\pm 3\sigma$ limits
(C) $\pm 4\sigma$ limits
(D) $\pm 6\sigma$ limits

29. If the angle of blade at outlet is given by θ, what will be the maximum efficiency of the impulse turbine?
(A) $(1-\sin\theta)/2$
(B) $(1+\sin\theta)/2$
(C) $(1+\cos\theta)/2$
(D) $(1-\cos\theta)/2$

30. Materials become harder due to strain hardening. Strain hardening in case of steel occurs
(A) Between yield strength and ultimate strength
(B) Between limit of proportionality and yield strength
(C) Between ultimate strength and fracture point
(D) Below limit of proportionality

31. The difference between actual sales and breakeven point is known as
(A) Margin of safety
(B) Price-cost margin
(C) Contribution
(D) Profit

32. In a steady flow reversible adiabatic process, work done is equal to:
(A) Change in internal energy
(B) Change in entropy
(C) Change in enthalpy
(D) Heat transferred

33. The refrigerant R-717 is
(A) Air
(B) Water
(C) Ammonia
(D) Carbon dioxide

34. In a tension test, fracture takes place along a crystallographic plane, on which the normal tensile stress is maximum. Such plane is called
(A) Shear plane
(B) Neutral plane
(C) Cleavage plane
(D) Fracture plane

35. The ideal angle of banking provided on the curves of the roads depends on:
(A) Weight of the vehicle.
(B) Square of the velocity of the vehicle.
(C) Nature of the road surface.
(D) Co-efficient of friction between the road and vehicle contact point.

36. A shaft turns 150 rpm under a torque of 1500 Nm. The power transmitted is
(A) 5π kW
(B) 7.5π kW
(C) 10π kW
(D) 15π kW

37. The metal suitable for making bearings that are subjected to heavy load is:
(A) Monel metal
(B) Phosphor bronze
(C) White metal
(D) Silicon bronze

38. What is the ratio of Inertia force to viscous force called?
(A) Mach's number
(B) Froude number
(C) Weber number
(D) Reynold's number

39. Which of the following layout has the properties of both line and functional layouts?
(A) Product layout
(B) Process layout
(C) Group layout
(D) Fixed position layout

40. Crowning on pulley helps
(A) In decreasing the slip of the belt
(B) In increasing the slip of the belt
(C) To increase pulley life
(D) To decrease pulley life

41. Which of the following is the best analogy for the trace of a stylus instrument?
(A) A topographical map
(B) A rolling ball
(C) A pin- ball machine
(D) A phonograph

42. Work done during a process can be determined by fpdV when the process is
(A) Isentropic
(B) Isothermal
(C) Adiabatic
(D) Quasi-static

43. Cast Iron is a:
(A) Ductile material
(B) Malleable material
(C) Brittle material
(D) Tough material

44. Total water discharge through Pelton Wheel is given as 10 cubic meter per second and through a nozzle is given as 2 cubic meter per second. Which of the following will be the number of jets in the Pelton Wheel?
(A) 20
(B) 15
(C) 10
(D) 5

45. Austenitic stainless steel contains
(A) 18% chromium and 8% nickel
(B) 8% chromium and 18% nickel
(C) 14% chromium and 0.35% carbon
(D) 14% nickel and 0.35% carbon

46. Which of the following relation is a mathematical expression of Grashof's law? S, L, P and Q denote length of the smallest, longest and other two links respectively.
(A) $L+P < S+Q$
(B) $L+S < P+Q$
(C) $L+S > P+Q$
(D) $L+P = S+Q$

47. The probability of a device performing its function for the period intended, under the prescribed operating condition is known as
(A) Durability
(B) Quality
(C) Usability
(D) Reliability

48. Productivity can be improved by
(A) Increasing inputs for constant outputs
(B) Decreasing outputs for constant inputs
(C) Increasing inputs and outputs both in same proportion
(D) Decreasing inputs for constant outputs

49. In case of resistance spot welding, if plate thickness is given as 5 mm, then what should be the diameter of spot weld?
(A) 5 mm
(B) 6 mm
(C) 7 mm
(D) 8 mm

50. What is the structure obtained when steel is quenched in water?
(A) Pearlite
(B) Sorbite
(C) Troosite
(D) Martensite

51. Which of the following forecasting technique uses three types of participants: decision makers, staff personnel and respondents?
(A) Expert's opinion
(B) Sales force survey
(C) Consumer survey
(D) Delphi method

52. Which of the following is a part of the steering linkage?
(A) Pitman arm
(B) Wheel rim
(C) Backing plate
(D) Master cylinder

53. The maximum efficiency of screw jack is (when φ - angle of friction):
(A) (1-sinφ) / (1+sinφ)
(B) (1+sinφ) / (1-sinφ)
(C) (1-tanφ) / (1+tanφ)
(D) (1+tanφ) / (1-tanφ)

54. In an experiment it is found that the bulk modulus (K) of a material is equal to its shear modulus (G). The Poisson's ratio (ν) is
(A) 0.125
(B) 0.25
(C) 0.375
(D) 0.5

55. The property of a material due to which it resists fracture caused by impact load is called as
(A) Resilience
(B) Toughness
(C) Stiffness
(D) Hardness

56. The initial clearance left between the leaves in a laminated leaf spring is known as
(A) Clearance
(B) Gap
(C) Nip
(D) Void

57. The working of hydraulic brake system follows
(A) The Pascal's law of hydraulics
(B) The Bernoulli's principle
(C) The Newton's law of cooling
(D) The Archimedes principle

58. The magnitude of buoyant force can be determined by:
(A) Newton's second law of motion
(B) Archimedes principle
(C) Principle of moments
(D) Newton's third law of motion

59. Drill diameter is measured over which of the following?
(A) Main body
(B) Plain shank portion
(C) Margin at the drill point
(D) Heel

60. Which of the following dynamometer is widely used to measure wide range of power at wide range of speed?
(A) Hydraulic
(B) Belt transmission
(C) Rope Brake
(D) Electric generator

61. Which of the following chucks in lathe machine is known as Universal Chuck?
(A) Magnetic Chuck
(B) Face plate
(C) Three jaws chuck
(D) Four jaws chuck

62. Heating of dry steam above saturation temperature is known as
(A) Superheating
(B) Supersaturation
(C) Super tempering
(D) Saturation heating

63. Euler's formula is applicable for which type of columns?
(A) Weak columns
(B) Long columns
(C) Short columns
(D) Strong columns

64. On which of the fundamental principle a jet engine works?
(A) Conservation of mass only
(B) Conservation of energy only
(C) Conservation of linear momentum
(D) Conservation of mass and energy

65. Transfer box is used in
(A) Front wheel Drive automobiles
(B) Rear wheel Drive automobiles
(C) Four wheel Drive automobiles
(D) Two wheeled automobiles

66. The strength of the unriveted or solid plate per pitch length is equal to
(A) $p \cdot d \cdot \sigma_t$
(B) $p \cdot t \cdot \sigma_t$
(C) $(p - t)d \cdot \sigma_t$
(D) $(p - d)t \cdot \sigma_t$

67. A refrigeration system
(A) Extracts heat from a cold body and delivers to a hot body
(B) Extracts heat from a hot body and delivers to a cold body
(C) Rejects heat to a cold body
(D) Rejects heat to a hot body

68. The ratio of heat extracted in the refrigerator to the work done on the refrigerant is called
(A) Coefficient of performance of refrigeration
(B) Coefficient of performance of heat pump
(C) Relative coefficient of performance
(D) Refrigerating efficiency

69. A refrigerator and heat pump operate between the same temperature limits. If coefficient of performance of the refrigerator is 4, then the coefficient of performance of the pump would be
(A) 3
(B) 4
(C) 5
(D) 6

70. Pareto Chart is used to
(A) Identify the critical factor caused for the defect
(B) Average number of defects in production
(C) Demonstrate the frequency distribution of good quality production
(D) Express the bar chart for mathematical analysis

71. Which of the following displacement diagram is chosen for better dynamic performance of a cam-follower mechanism?
(A) Simple Harmonic motion
(B) Parabolic motion
(C) Cycloidal motion
(D) Hyperbolic motion

72. The muff coupling is designed as
(A) Hollow shaft
(B) Solid shaft
(C) Thin cylinder
(D) Thick cylinder

73. Flow ratio for a Kaplan Turbine is given as 0.6 and the head available is 20 meter. Which of the following will be the approximate velocity of flow at the inlet of the runner?
(A) 9 m/sec
(B) 12 m/sec
(C) 15 m/sec
(D) 18 m/sec

74. Viscosity of gases
(A) Remains constant with temperature
(B) Increases with increase in temperature
(C) Decreases with increase in temperature
(D) Increases with decrease in temperature

75. Which of the following materials is the best example of Amorphous material?
(A) Silver
(B) Brass
(C) Mica
(D) Glass

76. Kelvin-Planck's law deals with conservation of which of the following?
(A) Work
(B) Heat
(C) Mass
(D) Heat into work

77. What will be the controlling force curve in case of spring controlled governors?
(A) A zigzag line
(B) Hyperbolic
(C) Parabolic
(D) Straight line

78. For harder materials, the helix angle of drill is
(A) Less than 45 degree
(B) Equal to 45 degree
(C) Between 45 to 60 degree
(D) Between 60 to 90 degree

79. A heat engine is supplied with 800 kJ/s of heat at 600 K, and heat rejection takes place at 300 K. Which of the following results report a reversible cycle?
(A) 200 kJ/s are rejected
(B) 400 kJ/s are rejected
(C) 100 kJ/s are rejected
(D) 500 kJ/s are rejected

80. When bevel gears having equal teeth connect two shafts whose axes are mutually perpendicular, then the bevel gears are known as
(A) Skew bevel gears
(B) Spiral gears
(C) Miter gears
(D) Zerol bevel gears

81. Which one of the following is a flexible coupling?
(A) Sleeve coupling
(B) Flange coupling
(C) Bushed pin type coupling
(D) Split muff coupling

82. Modulus of rigidity is defined as the ratio of:
(A) Lateral stress & lateral strain
(B) Shear stress & shear strain
(C) Longitudinal stress & longitudinal strain
(D) Linear stress & linear strain

83. Internal energy of an ideal gas is a function of
(A) Temperature and volume
(B) Pressure and volume
(C) Pressure and temperature
(D) Temperature alone

84. Which of the following has the lowest freezing point temperature?
(A) Freon-11
(B) Freon-12
(C) Freon-22
(D) Ammonia

85. Which of the following device is used to check the profile of a gear tooth?
(A) Optical pyrometer
(B) Bench micrometer
(C) Telescopic gauge
(D) Optical projector

86. On a Mollier chart, the constant pressure lines
(A) Diverge from left to right
(B) Diverge from right to left
(C) Are equispaced throughout
(D) First rise up and then fall

87. Water at 5^0 C (ρ=1000 kg/m^3 and μ=1.519×10^{-3} kg/ms) is flowing steadily through a 0.3 cm diameter 9 m long horizontal circular pipe at an average velocity of 0.9 m/s. What is the pressure drop?
(A) 48.7 kPa
(B) 47.7 kPa
(C) 43.7 kPa
(D) 50.7 kpa

88. What is the purpose of ratchet screw in a micrometer screw gauge?
(A) To lock the dimension.
(B) To impart blow motion.
(C) To maintain sufficient and uniform measuring pressure.
(D) To allow zero adjustment.

89. Peaks and valleys of surface irregularities are called
(A) Asperities
(B) Waves
(C) Perspectives
(D) Manifolds

90. The size of abrasive grains in abrasive jet machining ranges from
(A) 1 to 10 microns
(B) 10 to 50 microns
(C) 50 to 100 microns
(D) 100 to 500 microns

91. The theory suitable for ductile materials is:
(A) Maximum principal stress theory
(B) Distortion energy theory
(C) Maximum principal strain theory
(D) Maximum shear stress theory

92. The efficiency of a Carnot engine depends on:
(A) Working substance
(B) Design & Size of engine
(C) Type of fuel fired
(D) Temperatures of source & sink

93. What is the purpose of using auto-collimator?
(A) To measure small angular differences.
(B) To measure flatness.
(C) To measure concavity.
(D) To check surface linearity.

94. The wet bulb depression is zero, when relative humidity is equal to
(A) Zero
(B) 0.5
(C) 0.75
(D) 1

95. Where does the intensity of bending stress at any point in a beam directly varies?
(A) Area of cross-section of beam
(B) Length of beam
(C) Polar moment of inertia
(D) Distance of point from the neutral axis

96. The value of initial tension in belts is equal to
(A) Tension in the tight side of the belt
(B) Tension in the slack side of the belt
(C) Sum of the tension in the tight side and slack side of the belt
(D) Average tension of the tight side and slack side of the belt

97. Which is the fluid whose viscosity does NOT change with the rate of deformation?
(A) Ideal fluid
(B) Real fluid
(C) Newtonian fluid
(D) Non-Newtonian fluid

98. What is the time of flight of a projectile on a horizontal plane, where u is the initial velocity of projectile, α is the angle of inclination, and g is the gravitational acceleration?
(A) 2 u sin α / g
(B) 2 u cos α / g
(C) u sin α / g
(D) u cos α / g

99. Deming award is related to
(A) Total Quality Management
(B) Lean Production
(C) Flexible manufacturing
(D) Agile Manufacturing

100. Design of shafts made of brittle material is based on
(A) Guest's theory
(B) Rankine's theory
(C) St. Venant's theory
(D) Von Mises theory

101. Which of the following mathematical distribution is used in p-chart?
(A) Normal distribution
(B) Binomial distribution
(C) Poisson distribution
(D) Exponential distribution

102. The maximum angle that can be set using a sine bar is limited to
(A) 30 Degrees
(B) 15 Degrees
(C) 45 Degrees
(D) 60 Degrees

103. Which amongst the following is an inversion of double slider Crank chain?
(A) Engine indicator
(B) Elliptical trammel
(C) Quick returns motion
(D) Coupled wheels of a locomotive

104. Which of the following product does cupola produce?
(A) Cast iron
(B) Pig iron
(C) Mild steel
(D) Weight iron

105. Draft tube is used in reaction turbine to
(A) Pass water downstream without eddies formation
(B) Convert the kinetic energy into pressure energy by gradual expansion of the flow cross-section
(C) Provide safety to the turbine
(D) Prevent water splitting

106. Gantt chart is applicable for
(A) Time study
(B) Motion study
(C) Sales forecasting
(D) Production scheduling

107. Numeric control is
(A) Used only for milling operations
(B) Used to produce exact number of parts per hour
(C) Controlled by means of a set of instructions
(D) Only used for lathe operations

108. Surface tension on hollow soap bubble is given by
(A) P = 2σ/d
(B) p = 3σ/d
(C) p = 4σ/d
(D) p = 8σ/d

109. The area under the curve on T-S diagram represents the
(A) Heat transfer for all the processes
(B) Heat transfer for adiabatic processes
(C) Heat transfer for reversible processes
(D) Heat transfer for irreversible processes

110. Which of the following pump is used to pump the viscous fluid?
(A) Reciprocating pump
(B) Centrifugal pump
(C) Axial flow pump
(D) Screw pump

111. The angle of friction is:
(A) The ratio of friction and normal reaction.
(B) The force of friction when the body is in motion.
(C) The angle between the normal reaction and the resultant of normal reaction and limiting friction.
(D) The force of friction at which the body is just about to move.

112. Isochoric process is also known as
(A) Constant volume process
(B) Constant temperature process
(C) Constant pressure process
(D) Constant enthalpy process

113. The strain energy stored in a body due to suddenly applied load compared to when it is applied gradually is:
(A) Same
(B) Twice
(C) Half
(D) Four times

114. The highest temperature during the cycle, in a vapour compression refrigeration system, occurs after
(A) Compression
(B) Condensation
(C) Expansion
(D) Evaporation

115. Diameter of shaft A is thrice that of diameter of shaft B. Power transmitted by shaft A when compared to shaft B will be
(A) 3 times
(B) 9 times
(C) 27 times
(D) 81 times

116. Gear is best mass, manufactured by
(A) Shaping
(B) Milling
(C) Hobbing
(D) Forming

117. An automatic expansion valve is required to maintain constant
(A) Pressure in the evaporator
(B) Temperature in the freezer
(C) Pressure in the liquid line
(D) Temperature in the condenser

118. As the rating of the pressure cap increases in the radiator, the boiling point of the coolant
(A) Decreases
(B) Remains the same
(C) Increases
(D) Initially increases and later decreases

119. The centre head attachment on a combination set is used to
(A) Measure angles
(B) Measure height and depth
(C) Measure distance between centers
(D) Locate the centre of a circular job

120. Pessimistic time and optimistic time of completion of an activity are given as 10 days and 4 days respectively, the variance of the activity will be
(A) 1
(B) 6
(C) 12
(D) 18

121. If the retardation produced due to braking is 3.1 m/s^2, the braking efficiency is
(A) 20%
(B) 31%
(C) 25%
(D) 35%

122. Johnson's rule is used for
(A) Sequencing problem
(B) Assignment problem
(C) Aggregate planning
(D) Scheduling

123. In a shaft basis system, the upper deviation of the size of shaft is
(A) 0
(B) 1
(C) Less than zero
(D) More than 1

124. SIMO chart is used for
(A) Micro motion study
(B) Method study
(C) Process analysis
(D) Plant layout

125. The maximum efficiency of a machine
(A) Is directly proportional to the velocity ratio
(B) Should occur when the load is 50% of maximum permissible load
(C) Is given by mechanical advantage divided by velocity ratio
(D) Is given by velocity ratio divided by mechanical advantage

126. Most accurately centering on Lathe can be done by
(A) Three-jaws chuck
(B) Four-jaws chuck
(C) Lathe dog
(D) Collets

127. The relationship that results between the two mating parts before assembly is called
(A) Limit
(B) Tolerance
(C) Fit
(D) Deviation

128. The power transmitted by a belt is maximum when the relation between maximum tension (T) and centrifugal tension (Tc) is
(A) T = 0.5 Tc
(B) T = Tc
(C) T = 2 Tc
(D) T = 3 Tc

129. The number of averaging period in simple moving average method of forecasting is increased for greater smoothing but at the cost of
(A) Accuracy
(B) Stability
(C) Visibility
(D) Responsiveness to changes

130. Acceptance sampling is normally used for
(A) Job-shop production
(B) Batch production
(C) Mass production
(D) Just-in -time production

131. The entropy of a fixed amount of incompressible substance,
(A) Decreases in every process in which the temperature increases
(B) Remains the same in every process in which the temperature increases
(C) Increases in every process in which temperature increases
(D) Increases in every process in which the temperature decreases

132. The ratio of aluminium and iron oxide in Thermit welding is
(A) 1:5:1
(B) 2:1
(C) 2.5:1
(D) 3:1

133. The pressure rise in the impeller should be equal to which head, in case of a centrifugal pump to start delivering liquid?
(A) Kinetic head
(B) Velocity head
(C) Manometric head
(D) Static head

134. How many grades of tolerances does the ISO system of limits and fits specify?
(A) 10
(B) 5
(C) 18
(D) 20

135. Which of the following is also known as a constant volume cycle?
(A) Carnot cycle
(B) Otto cycle
(C) Diesel cycle
(D) Dual combustion cycle

136. Involute profile is preferred over cycloidal profile because
(A) The profile is easy to cut
(B) Only one curve is required to cut
(C) The rack has a straight line profile and hence can be cut accurately
(D) It is universally accepted

137. What is the Miller index of a plane intersects the co-ordinate axes at x =2/3, y = 1/3, z = 1/2?
(A) 832
(B) 332
(C) 523
(D) 364

138. Zipper as a surface defect occurs in
(A) Casting process
(B) Welding process
(C) Machining process
(D) Rolling process

139. Which of the following eases the driver's effort in steering the vehicle?
(A) Positive caster
(B) Positive camber
(C) Negative caster
(D) Toe-in

140. What is the carbon content in pearlite or eutectoid steel?
(A) Below 0.8%
(B) 0.80%
(C) 1%
(D) 1.50%

141. The momentum correction factor (β) is used to account for:
(A) Change in direction of flow
(B) Change in total energy
(C) Non-uniform distribution of velocities at inlet and outlet sections
(D) Change in mass rate of flow

142. When measured from its base, the centre of gravity of a right circular solid cone whose height is 'h' will be at a distance of:
(A) h/2
(B) h/3
(C) h/4
(D) h/6

143. Which of the following is used for examination of crystal structure of material?
(A) Naked eye
(B) Microscope
(C) Optical microscope
(D) X ray

144. Subcooling is a process of cooling the refrigerant in vapour compression refrigeration system
(A) Before compression
(B) After compression
(C) Before throttling
(D) After throttling

145. A Carnot refrigeration cycle absorbs heat at 270 K and rejects it at 300 K. Calculate the C.O.P of this refrigeration cycle.
(A) 9
(B) 10
(C) 0.11
(D) 0.1

146. Two closed thin vessels, one cylindrical and other spherical with equal internal diameter and wall thickness are subjected to equal internal pressure. The ratio of hoop stress in the cylindrical vessel to that of spherical vessel is
(A) 4
(B) 2
(C) 1
(D) 0.5

147. If the sum of all the forces acting on a body is zero, it may be concluded that the body
(A) Must be in equilibrium
(B) Cannot be in equilibrium
(C) Maybe in equilibrium provided the forces are parallel
(D) Maybe in equilibrium provided the forces are concurrent

148. The movable wicket gates of a reaction turbine are used to
(A) Control the flow of water passing through the turbine
(B) Control the pressure under which the turbine is working
(C) Strengthen the casting of the turbine
(D) Reduce the size of the turbine

149. One kg of steam sample contains 0.8 kg dry steam; Calculate its dryness fraction.
(A) 0.2
(B) 0.6
(C) 0.8
(D) 1

150. In a refrigerating machine, if the lower temperature is fixed, then the C.O.P of the machine can be increased by
(A) Increasing the higher temperature
(B) Decreasing the higher temperature
(C) Operating the machine at a lower speed
(D) Operating the machine at a higher speed

Space for Rough work:

Space for Rough work: