

011/2020

Maximum : 100 marks

Time : 1 hour and 15 minutes

1. Radial height of a tooth above the pitch circle of a spur gear is:  
(A) dedendum (B) pitch point  
(C) tooth face (D) addendum
2. Connecting link between the piston rod and \_\_\_\_\_ of a steam engine is cross head.  
(A) cylinder (B) valve  
(C) connecting rod (D) eccentrics
3. Which one of the following is not a locking device?  
(A) Locking by plate (B) Split pin  
(C) Lock washers (D) Hexagonal bolt
4. Ratio between inertia forces to viscous forces is known as:  
(A) Reynolds's number (B) Poisson's ratio  
(C) Power factor (D) Strain
5. The value of acceleration due to gravity ( $g$ ) is equal to:  
(A)  $10.56 \text{ m/s}^2$  (B)  $9.81 \text{ m/s}^2$   
(C)  $11.36 \text{ m/s}^2$  (D)  $1.2 \text{ m/s}^2$
6. If  $P$  and  $Q$  are two forces and angle between them is ' $\alpha$ ' then according to parallelogram law of forces the resultant force 'R' =:  
(A)  $\sqrt{(P^2 + Q^2 + 2PQ \sin \alpha)}$  (B)  $\sqrt{(P + Q + 2PQ \cos \alpha)}$   
(C)  $\sqrt{(P + Q^2 + 2P^2 Q^2 \cos^2 \alpha)}$  (D)  $\sqrt{(P^2 + Q^2 + 2PQ \cos \alpha)}$
7. One kilo gram mass is equivalent as \_\_\_\_\_ N.  
(A) 1.5 (B) 9.81  
(C) 8.32 (D) 6.12
8.  $F = mx$  a is derived from:  
(A) Newton's first law (B) Newton's second law  
(C) Newton's third law (D) Newton's law of gravitation

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[P.T.O.]

9. The body which does not deform when subjected to external forces is termed as:  
 (A) flexible body (B) composit training  
 (C) elastic body (D) rigid body
10. Geometric center of the area where the entire area can be assumed to be concentrated is known as:  
 (A) centroid of area (B) midpoint of area  
 (C) eccentricity of area (D) concentricity of area
11. Whenever a body moves or tends to move over another body \_\_\_\_\_ force is developed at the contact surface.  
 (A) laminar (B) co-planar  
 (C) anti frictional (D) frictional
12. The angle between normal reaction at the contact surface and the resultant of normal reaction and limiting friction is:  
 (A) angle of friction (B) angle of reaction  
 (C) angle of repose (D) angle of deviation
13. The point about which the body can be assumed to be rotating at the given instant is called \_\_\_\_\_ of rotation.  
 (A) instantaneous retardation (B) instantaneous motion  
 (C) instantaneous plane (D) instantaneous center
14. The absolute pressure of a given mass of a perfect gas varies inversely as its volume when the \_\_\_\_\_ remains constant.  
 (A) volume (B) temperature  
 (C) flow (D) velocity
15. A machine which converts mechanical energy in to pressure energy is known as:  
 (A) engine (B) generator  
 (C) pump (D) motor
16. In double acting reciprocating pumps, the water is acting on \_\_\_\_\_ sides of the piston.  
 (A) both (B) one  
 (C) either in one or two (D) nearer

17. In order to produce air tight reveted joint ————— process is required.
- (A) bevelling (B) caulking  
(C) fillering (D) sealing
18. Least count of a vernier caliper is ————— mm.
- (A) 0.002 (B) 0.01  
(C) 0.02 (D) 0.001
19. H9 holes can be produced by ————— process.
- (A) punching and enlarging (B) drilling and chamfering  
(C) counter sinking and drilling (D) boring and reaming
20. The device used to connect two shafts together at their ends for the purpose of transmitting power is known as:
- (A) sleeve (B) coupling  
(C) bearing (D) nipples
21. Standard size of the part, which is same for both hole and its shaft is known as:
- (A) Enlarged size (B) reduced size  
(C) Nominal size (D) Measured size
22. Difference between maximum and minimum limit of size is:
- (A) allowance (B) tolerance  
(C) limits of size (D) actual deviation
23. Trimmed size of A1 drawing sheet will be:
- (A) 147 mm × 210 mm (B) 210 mm × 297 mm  
(C) 420 mm × 594 mm (D) 594 mm × 841 mm
24. The drawing which is used for explaining working principle of any machine is known as
- (A) production drawing (B) exploded drawing  
(C) schematic drawing (D) tabular drawing
25. Length of the arrow head should be about ————— times its maximum width.
- (A) three (B) two  
(C) four (D) five

26. A section is formed by passing a cutting plane at right angles to the axis of the object is termed as:
- (A) partial section (B) full section  
(C) revolved section (D) offset section
27. Actual depth of a British Association thread in terms of pitch is:
- (A)  $d = p$  (B)  $d = 0.6 p$   
(C)  $d = 0.01 p$  (D)  $d = 0.001 p$
28. Width across flats (W) of a hexagonal nut can be found by \_\_\_\_\_ formula.
- (A)  $2 D + 1 \text{ mm}$  (B)  $D + 3 \text{ mm}$   
(C)  $3 D + 3 \text{ mm}$  (D)  $1.5 D + 3 \text{ mm}$
29. If thickness of the plate is 't' then the diameter of a rivet is:
- (A)  $d = \sqrt{t}$  (B)  $d = 6\sqrt{t}$   
(C)  $d = 2\sqrt{t}$  (D)  $d = 3\sqrt{t}$
30. The bearing pressure is perpendicular to the axis of shaft in \_\_\_\_\_ bearings.
- (A) journal (B) pivot  
(C) thrust (D) collar
31. Thread angle of Acme thread is:
- (A)  $55^\circ$  (B)  $29^\circ$   
(C)  $35^\circ$  (D)  $45^\circ$
32. Standard taper of taper key is:
- (A) 1 in 50 (B) 1 in 40  
(C) 1 in 100 (D) 1 in 30
33. In a muff coupling, the outside diameter and the length of the muff are \_\_\_\_\_ and \_\_\_\_\_ the diameter of the shaft.
- (A) two times and two times (B) three times and two times  
(C) three times and three times (D) two times and three times

34. If width of a 'V' belt is 10 mm then the length of the belt will be in a range of \_\_\_\_\_ mm.
- (A) 150 to 860 mm (B) 260 to 860 mm  
(C) 212 to 1262 mm (D) 420 to 2820 mm
35. The formula for finding out circular pitch of a spur gear is:
- (A)  $\pi \times$  module pitch (B)  $\pi /$  module pitch  
(C)  $\pi \times$  number of teeth (D)  $\pi /$  number of teeth
36. The engine produces power by the:
- (A) Rotation of the crankshaft  
(B) Valve action  
(C) Combustion pressure pushing on piston  
(D) Up and down movement of piston
37. A Telescopic gauge can be used to measure a cylinder bore if \_\_\_\_\_ is used to the telescopic gauge?
- (A) Micrometer (B) Feeler gauge  
(C) Straight edge (D) Dial indicator
38. The depth of water formed by providing a tap in the water closet is called:
- (A) Water cushion (B) Water seal  
(C) Water meter (D) Water barrier
39. \_\_\_\_\_ bacteria can live and develop in the presence or absence of oxygen.
- (A) Aerobic (B) Anaerobic  
(C) Facultative (D) All of the above
40. The waste water from the kitchen, bathroom etc is called:
- (A) Sewage (B) Ashes  
(C) Garbage (D) Sullage
41. The capillary rise is due to:
- (A) Cohesion (B) Adhesion  
(C) Both of the above (D) None of the above

42. The law related to transmission of pressure is:
- (A) Faraday's law (B) Pascal's law  
(C) Stevin's law (D) None of the above
43. A bearing shell has a slightly larger arc than bearing housing is called:
- (A) Bearing tang (B) Bearing saddle  
(C) Bearing crush (D) Bearing spread
44. In a normally operating engine, intake and exhaust valves are opened by a cam closed by the:
- (A) Rocker arm or cam follower (B) Lifters or tappets  
(C) Valve spring (D) Valve guide or pushrod
45. The distributor injection pump has:
- (A) A rotor that sends fuel to the injector  
(B) A barrel and plunger assembly for each cylinder  
(C) A helix cut in each plunger  
(D) All of the above
46. Which of the following engine do not have mechanical balance?
- (A) Inline engine (B) Single cylinder engine  
(C) 'V' engine (D) Radial engine
47. How many, crankshaft rotations required to get one power stroke in a four stroke single cylinder diesel engine?
- (A) One (B) Three  
(C) Two (D) Four
48. The centre of pressure on any surface immersed in a liquid is the point through which the \_\_\_\_\_ acts?
- (A) Resultant pressure (B) Weight of surface  
(C) Buoyant force (D) Total pressure
49. The bottom edge of the notch over which the liquid flows is called?
- (A) Bed (B) Sill  
(C) Sluice (D) Vent

50. A Sewage contains:
- (A) 0.1% matters (B) 99.9% water  
(C) Both of the above are correct (D) None of the above
51. The openings constructed on lines of sewers or drains in order to enable men enter or leave them is called:
- (A) Pot hole (B) Lamp hole  
(C) Street inlet (D) Man holes
52. What is the volume of the space above the piston at BDC?
- (A) Swept volume (B) Combustion chamber volume  
(C) Total volume (D) Clearance volume
53. What effect does backpressure have on the operation of an IC engine?
- (A) Reduces power (B) Increases fuel economy  
(C) Increases the amount of CO (D) All of the above
54. Percentage of fuel energy lost to the cylinder walls is approximately:
- (A) 15% (B) 30%  
(C) 5% (D) 80%
55. Firing order of a 6- cylinder in line engine is:
- (A) 1-6-3-5-2-4 (B) 1-3-6-2-4-5  
(C) 1-4-3-2-6-5 (D) 1-5-3-6-2-4
56. The property of liquid used in the manufacturing of lead shots is :
- (A) Viscosity (B) Capillarity  
(C) Surface tension (D) Density
57. Barometer is used to measure :
- (A) Atmospheric pressure (B) Vacuum pressure  
(C) Absolute pressure (D) Gauge pressure
58. The equation of continuity in brief states that the \_\_\_\_\_ of the fluid through a section remains the same :
- (A) Velocity (B) Mass  
(C) Direction (D) Total head

59. Thrust bearing wear will cause excessive :
- (A) Crankshaft bending (B) Crankshaft vibration  
(C) Crankshaft endplay (D) Crankshaft speed
60. A venturimeter is used to measure :
- (A) Pressure in a pipe (B) Total energy in a pipeline  
(C) Velocity of flow in a pipeline (D) Discharge through a pipe
61. The heading up of water due to an obstruction in its flow is called :
- (A) Afflux (B) Hydraulic jump  
(C) Backwater (D) None of the above
62. Detonation results from :
- (A) High idle speed during cold starts (B) Over advanced ignition timing  
(C) High-octane fuel (D) Lowering the compression ratio
63. Hydraulic radius is the ratio between wetted area to :
- (A) Wetted perimeter (B) Wetted bed width  
(C) Wetted side length (D) Any of the above
64. Generally in 4 stroke diesel engine the inlet valve opens :
- (A) 25 degree before TDC (B) 20 degree before TDC  
(C) 40 degree before TDC (D) 10 degree before TDC
65. The three basic pollutants the emission system control
- (A) HC, H<sub>2</sub>O and NO (B) CO<sub>2</sub>, NO and HC  
(C) HC, CO and NO (D) CO<sub>2</sub>, H<sub>2</sub>O and HC
66. Which is the most common tool used for drawing circles :
- (A) French Curve (B) Mini Drafter  
(C) Divider (D) Compass
67. Drawing pencils are graded according to increase in relative :
- (A) Diameter (B) Sharpness  
(C) Length (D) Hardness

68. In unidirectional system the dimensions are :
- (A) Placed above the dimension line
  - (B) Placed below the dimension line
  - (C) Placed by breaking the dimension line in the middle
  - (D) None of the above
69. The scale of a drawing is given as 1:20 what is the representative fraction :
- (A) 20
  - (B) 1/20
  - (C) 0.5
  - (D) 0.02
70. How many external tangents are there for two circles :
- (A) 1
  - (B) 2
  - (C) 3
  - (D) 4
71. The sections cut by a plane on a right circular cone are called :
- (A) Parabola sections
  - (B) Conic sections
  - (C) Elliptical sections
  - (D) Hyperbolic sections
72. Which of the following is conic section :
- (A) Circle
  - (B) Rectangle
  - (C) Triangle
  - (D) Square
73. A plane is held parallel to horizontal plane in which view we can watch drawing on that plane :
- (A) Top view
  - (B) Front view
  - (C) Back view
  - (D) Side view
74. A circle is placed at 20 degrees with vertical the view from top view will be :
- (A) Line
  - (B) Circle
  - (C) Ellipse
  - (D) Oval
75. Which of the following represents reducing scales
- (A) 1 : 1
  - (B) 1 : 2
  - (C) 2 : 1
  - (D) 10 : 1

76. In first angle projection method object is assumed to be placed in
- (A) First quadrant (B) Second quadrant  
(C) Third quadrant (D) Fourth quadrant
77. The dotted line represents :
- (A) Hidden edge (B) Projection line  
(C) Centre line (D) Hatching line
78. The length width in case of an arrow head is :
- (A) 1 : 1 (B) 2 : 1  
(C) 3 : 1 (D) 4 : 1
79. The internal angle of a regular hexagon is \_\_\_\_\_ degree :
- (A) 72 (B) 108  
(C) 120 (D) 150
80. A point 'p' is above horizontal plane and in front of vertical plane. The point is in :
- (A) First quadrant (B) Second quadrant  
(C) Third quadrant (D) Fourth quadrant
81. Orthographic projection is also known as :
- (A) Single view projection (B) Two view projection  
(C) Multi view projection (D) All the above
82. How many pairs of parallel lines are there in regular hexagon :
- (A) 2 (B) 3  
(C) 6 (D) 1
83. When drawing a perpendicular line through a point which is nearer to the middle of a given line is cut at two points on the line?
- (A) A circle (B) A square  
(C) A rectangle (D) An arc
84. The line perpendicular to a tangent and is passing through the point of contact is called :
- (A) Perpendicular bisector (B) Angle bisector  
(C) Normal (D) Tangent

85. The preferred size of the drawing sheet is recommended by the :
- (A) BIS (B) ASME  
(C) ASTE (D) NIST
86. By converting  $5.6 \text{ m}^2$  in to  $\text{cm}^2$  answer will be:
- (A)  $0.0056 \text{ cm}^2$  (B)  $5600 \text{ cm}^2$   
(C)  $56000 \text{ cm}^2$  (D)  $560 \text{ cm}^2$
87. A rectangular field is 40 m long and 30 m wide. Perimeter of rectangular field is:
- (A)  $20 \text{ m}^2$  (B)  $18 \text{ m}^2$   
(C)  $160 \text{ m}^2$  (D)  $140 \text{ m}^2$
88. The perimeter of a triangle of side 10 cm, 5 cm and 6 cm is:
- (A) 21 cm (B) 3 cm  
(C) 20 cm (D) 90 cm
89. Ninu took two rounds of a ground 180 cm long and 100 m wide. The total distance covered by him is:
- (A) 280 m (B) 560 m  
(C) 1120 m (D) 2240 m
90. Find the side of a square whose perimeter is 324 cm:
- (A) 18 cm (B) 81 cm  
(C) 24 cm (D) 3.24 cm
91. The amount of region enclosed by a plane closed figure is called:
- (A) Area (B) Perimeter  
(C) Circumference (D) Semi perimeter
92. The area of a square field is 24200 sq.m. How long will a man take to cross the field, diagonally at the rate of 6.6 km/hr:
- (A) 3 minutes (B) 2 minutes  
(C) 2.4 minutes (D) 2 min 40 seconds
93. A 5 cm cube is cut in to as many 1 cm cubes as possible. What is the ratio of the surface area of the larger cube to that of the sum of the surface areas of the smaller cube
- (A) 1 : 6 (B) 1 : 5  
(C) 1 : 25 (D) 1 : 125

94. What is the area of an equilateral triangle of side 16 cm.
- (A)  $48\sqrt{3} \text{ cm}^2$  (B)  $128\sqrt{3} \text{ cm}^2$   
(C)  $9.6\sqrt{3} \text{ cm}^2$  (D)  $64\sqrt{3} \text{ cm}^2$
95. Find the area of a trapezium whose parallel sides are 20 cm and 18 cm long and the distance between them is 15 cm:
- (A)  $225 \text{ cm}^2$  (B)  $275 \text{ cm}^2$   
(C)  $285 \text{ cm}^2$  (D)  $315 \text{ cm}^2$
96. If the edge of a cube is 1cm then which of the following is its volume:
- (A)  $6 \text{ cm}^3$  (B)  $3 \text{ cm}^3$   
(C)  $1 \text{ cm}^3$  (D) None of the above
97. If the dimensions of a room are  $l$ ,  $b$ ,  $h$  ( $l$ -length,  $b$ -breadth,  $h$ -height) then which of the following is the area of its four walls.
- (A)  $2h(l+b)$  (B)  $2h(l+h)$   
(C)  $2l(h+b)$  (D) None of the above
98. Two identical cubes each of total surface area of  $6 \text{ cm}^2$  are joined end to end. Which of the following is the total surface area of the cuboid so formed.
- (A)  $12 \text{ cm}^2$  (B)  $18 \text{ cm}^2$   
(C)  $10 \text{ cm}^2$  (D)  $8 \text{ cm}^2$
99. An octagon has \_\_\_\_\_sides.
- (A) 7 (B) 8  
(C) 4 (D) 5
100. A man walks entirely around his semi circular garden. What is the area of his garden if he walks 324 m
- (A)  $18 \text{ m}^2$  (B)  $6237 \text{ m}^2$   
(C)  $5248 \text{ m}^2$  (D)  $5368 \text{ m}^2$
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**SPACE FOR ROUGH WORK**

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