55/2019

Maximum : 100 marks

Time : 1 hour and 15 minutes

1. SI unit of work is:

    (A) Pound   (B) Newton

    (C) Watt   (D) Joule

2. When a person opens a door, he applies:

    (A) Force   (B) Torque

    (C) Moment   (D) None of the above

3. The escape velocity from the surface of the earth is approximately equal to:

    (A) 9.81 km/s   (B) 11.2 km/s

    (C) 14.0 km/s   (D) 22.0 km/s

4. If the momentum of a given particle is doubled, then its kinetic energy will be:

    (A) doubled   (B) unaffected

    (C) halved   (D) quadrupled

5. When the car moves on road its wheel has:

    (A) Purely rotational motion   (B) Rotational and translational motion

    (C) Purely translational motion   (D) None of the above

6. The friction experienced by a body when it is in motion is called:

    (A) Rolling friction   (B) Static friction

    (C) Limiting friction   (D) Dynamic friction

7. Moment of inertia of a circular section about its diameter (d) is:

    (A) $(\pi/16)d^4$ (B) $(\pi/32)d^4$

    (C) $(\pi/64)d^4$ (D) $(\pi/4)d^4$

A   **3**

8. The force applied on a body of mass 150 kg to produce an acceleration of 10 m/s², is:

   (A) 15 N
   (B) 150 N

   (C) 1500 N
   (D) 3000 N

9. Two forces act an angle of 120°. If the greater force is 50 kg and their resultant is perpendicular to the smaller force, the smaller force is:

   (A) 20 kg
   (B) 25 kg

   (C) 30 kg
   (D) 35 kg

10. The process of finding out the resultant force is known as:

   (A) Superposition of forces
   (B) Composition of forces

   (C) Addition of forces
   (D) Resolution of forces

11. The point, at which the whole weight of the body may be considered to act, is known as:

   (A) Centre of mass
   (B) Centre of gravity

   (C) Centre of curvature
   (D) Moment of inertia

12. If the resultant of forces acting on a body is zero, the body:

   (A) is in equilibrium
   (B) is moving with non uniform velocity

   (C) is not in equilibrium
   (D) none of the above

13. The unit of force in C.G.S. system of units, is called:

   (A) Dyne
   (B) Kg

   (C) Newton
   (D) All the above

14. If the angular distance, $0 = 2t^3 - 3t^2$ the angular acceleration at t = 1sec. is:

   (A) $1 \, \text{rad/sec}^2$
   (B) $6 \, \text{rad/sec}^2$

   (C) $4 \, \text{rad/sec}^2$
   (D) $12 \, \text{rad/sec}^2$

15. The resultant of two forces which are acting at an angle θ is:

   (A) $\sqrt{\left(P^2 - Q^2 + 2PQ\cos\theta\right)}$
   (B) $\sqrt{\left(P^2 - Q^2 + 2\,PQ\sin\theta\right)}$

   (C) $\sqrt{\left(P^2 + Q^2 + 2PQ\cos\theta\right)}$
   (D) $\sqrt{\left(P^2 + Q^2 + 2PQ\sin\theta\right)}$

16. The resultant of two equal forces P making an angle 2θ is given by:

(A) $2\text{Psin}\,\theta$ (B) $2\text{Ptan}\,\theta$

(C) $2\text{Pcos}\,\theta$ (D) $2\text{Pcot}\,\theta$

17. The rate of doing work is known as:

(A) Power   (B) Potential energy

(C) Kinetic energy   (D) None of the above

18. The total energy possessed by a system of moving bodies:

(A) Is constant at every instant   (B) Varies from point to point

(C) Is maximum in the start   (D) None of the above

19. If the tension in a cable supporting a lift moving upwards is twice the tension when the lift is moving downwards, the acceleration of the lift, is:

(A) g/2   (B) g/4

(C) g/3   (D) g/5

20. In a lifting machine with efficiency 60%, an effort of 200 N is required to raise a load of 6 kN.The velocity ratio of the machine is :

(A) 30   (B) 60

(C) 80   (D) 50

21. Which of the following represent reducing scale?

(A) 1:1   (B) 2:1

(C) 1:2   (D) 10:1

22. The following line is used for dimension line:

(A) Continuous thick   (B) Chain thin line

(C) Continuous thin   (D) Short zigzag thin

23. The front view of a rectangle, when its plane is parallel to HP and perpendicular to VP, is:

(A) Rectangle   (B) Line

(C) Square   (D) Point

24. The following are the Polyhedron except:

(A) Prism   (B) Cube

(C) Pyramid   (D) Cylinder

25. The following are the solids of revolution except:

(A) Prism   (B) Cone

(C) Sphere   (D) Cylinder

26. The top view of a right cylinder resting on HP on its base rim is :

(A) Ellipse   (B) Rectangle

(C) Circle   (D) Square

27. The following is formed by revolving rectangle about one of its sides which remains fixed:

(A) cylinder   (B) hemi sphere

(C) sphere   (D) cone

28. The sectional plane are represented by :

(A) Continuous thick line   (B) Chain thin line

(C) Continuous thin line   (D) Chain thin line having thick edges

29. The dotted lines represents:

(A) hidden edges   (B) centre line

(C) projection line   (D) hatching line

30. A tetrahedron has four equal —————— faces.

(A) square   (B) triangular

(C) rectangular   (D) circular

31. In first angle projection method, object is assumed to be placed in:

(A) First quadrant   (B) Third quadrant

(C) Second quadrant   (D) Fourth quadrant

32. The internal angle of regular hexagon is —————— degree.

(A) 72   (B) 120

(C) 108   (D) 150

33. A right regular hexagonal prism in resting on HP on its base, its top view is a.

    (A) square   (B) hexagon

    (C) rectangle   (D) pentagon

34. The following is the method for development of a sphere:

    (A) Parallel line method   (B) Triangulation method

    (C) Radial line method   (D) Approximate method

35. The Length : Width in case of an arrow head is:

    (A) 1:1   (B) 2:1

    (C) 3:1   (D) 4:1

36. The ability of engine bearings to accommodates small variation in shaft is its:

    (A) Embadability   (B) Conformability

    (C) Adaptability   (D) Fatigue strength

37. Combustion knock in a CI engine is generally known as:

    (A) Diesel knock   (B) Diesel lock

    (C) Both (A) and (B)   (D) Detonation

38. Which of the following are provided to the crank shaft to the balancing of main journals?

    (A) crank arm   (B) vibration damper

    (C) crank weight   (D) crank pulley

39. To improve the resistance to wear and corrosion, cylinder liners are plated with:

    (A) platinum   (B) vanadium

    (C) zinc   (D) chromium

40. Tendency of fuel to change from liquid to vapor form is called:

    (A) pour point   (B) volatility

    (C) viscosity   (D) flash point

41. Piston rings and cylinder liners are:

    (A) Die casted   (B) Hollow casted

    (C) Sand casted   (D) Centrifugal casted

42. The leaking of the combustion charges to the crank case is known as:

(A) blow-by

(B) by pass

(C) dilution

(D) scavenging

43. Find the odd one :

(A) Piston pin

(B) Wrist pin

(C) Crank pin

(D) Gudgeon pin

44. Double row side valve mechanism incorporated with a:

(A) H-head engine

(B) L-head engine

(C) F-head engine

(D) T-head engine

45. The term harmonic balancer is used instead of:

(A) fly wheel

(B) crank shaft

(C) vibration damper

(D) none of these

46. T- slot provided in the piston:

(A) To accommodate the expansion of piston when heated up

(B) For cooling purpose

(C) To reduce piston weight

(D) For the passage of oil

47. Brake power of an engine is measured with a:

(A) vacuum gauge

(B) dynamo meter

(C) taco meter

(D) oscilloscope

48. Disadvantage of a pre-combustion chamber engine is :

(A) cold starting problems

(B) More engine knock

(C) Less power

(D) Both (B) and (C)

49. Detonation can be controlled by:

(A) advanced timing

(B) pre heating of charge

(C) increase in compression ratio

(D) cooling of the charge

50. By providing a thick head gasket, the compression ratio of the engine will:

    (A)   increase   (B)   decrease

    (C)   double   (D)   remain constant

51. A pitot tube is used to measure:

    (A)   Pressure   (B)   Pressure difference

    (C)   Velocity of flow   (D)   Density of fluid

52. Forces acting on a floating body are:

    (A)   Inertia and gravity   (B)   Buoyancy and gravity

    (C)   Buoyancy and inertia   (D)   Pressure and gravity

53. Euler's equation for the motion of liquid assumes that:

    (A)   velocity of flow is non uniform

    (B)   flow is unsteady along the stream line

    (C)   fluid is viscous

    (D)   fluid is homogeneous and incompressible

54. The most efficient section of a channel is:

    (A)   Triangular   (B)   Rectangular

    (C)   Trapezoidal   (D)   Square

55. Velocity of fluid particles at the centre of pipe section is:

    (A)   maximum   (B)   minimum

    (C)   medium   (D)   equal throughout

56. Why the alcohol is used in manometer?

    (A)   It provides longer column due to low density

    (B)   It is clearly visible

    (C)   It has low vapour pressure

    (D)   It has low surface tension

57. To avoid cavitations in centrifugal pump:

    (A)   suction pressure should be low   (B)   delivery pressure should be low

    (C)   suction pressure should be high   (D)   delivery pressure should be high

58. A structure used to dam up a stream or river over which the water flow is called:

    (A) Orifice   (B) Notch

    (C) Mouth piece   (D) Weir

59. Bacteria which can survive without oxygen is called:

    (A) Aerobic bacteria   (B) Anaerobic bacteria

    (C) Pathogenic bacteria   (D) Non-pathogenic bacteria

60. The pressure conduit laid underground may not be subjected to:

    (A) pressure due to external load

    (B) internal pressure of water

    (C) longitudinal temperature stress

    (D) longitudinal stress due to unbalanced pressure

61. Water consumption per capita per day for hostel use in India as per Indian standard is:

    (A) 40 litres   (B) 80 litres

    (C) 115 litres   (D) 135 litres

62. The central rural sanitation program started on:

    (A) 1986   (B) 1996

    (C) 2006   (D) 2016

63. Most common coagulant is:

    (A) Chlorine   (B) Alum

    (C) Bleaching powder   (D) Potassium permanganate

64. Slow sand filter is more efficient for the removal of :

    (A) bacteria   (B) turbidity

    (C) odour   (D) acidity

65. The equipment used to checking the levels of the sewer inverts is :

    (A) Dumpy level   (B) Theodolite

    (C) Boning rod   (D) None of these

66. The formula for finding volume of hollow cylinder is —————————.

    (A) $\pi h(R+r)(R-r)$ (B) $\pi r^2 h$

    (C) $4/3\,\pi\,r^3$ (D) $2/3\pi r^3$

67. Find the area of a circle which inscribe in a square of side 14 cm:

    (A) 140 sq.cm   (B) 154 sq.cm

    (C) 160 sq.cm   (D) 196 sq.cm

68. If volume of cylinder is 900 cu.cm with height of 20 cm, then diameter of cylinder is:

    (A) 24 cm   (B) 9.57 cm

    (C) 7.57 cm   (D) 12.23 cm

69. What is area of a circle whose circumference is 44 cm?

    (A) 150 sq.cm   (B) 152 sq.cm

    (C) 154 sq.cm   (D) 156 sq.cm

70. How many balls of 2 cm radius can be made by melting of a big ball of diameter 16 cm?

    (A) 120   (B) 64

    (C) 32   (D) None of the above

71. Find the angle of sector whose radius is 10 cm and area is 78.5 sq.cm:

    (A) 60 degree   (B) 75 degree

    (C) 90 degree   (D) 45 degree

72. One side of rectangular field is 4 m and its diagonal is 5 m. The area of the field is :

    (A) 12 sq.m   (B) 20 sq.m

    (C) 15 sq.m   (D) $4\sqrt{5}$ sq.m

73. If the volume of two cubes are in the ratio 27 : 1. The ratio of their edges is :

    (A) 1 : 3   (B) 3 : 1

    (C) 9 : 1   (D) 1 : 6

74. The sides of a triangle are 5 m, 12 m and 13 m. The area of the triangle is —————————.

    (A) 30 sq.Cm   (B) 45 sq.Cm

    (C) 65 sq.Cm   (D) none of the above

75. If cube of side "*a*" the total surface area is :

    (A) a^2 (B) $3a$

    (C) $6a^2$ (D) $6a$

76. Find the area of a square of diagonal 30 cm:

    (A) 500 sq.cm   (B) 900 sq.cm

    (C) 450 sq.cm   (D) 600 sq.cm

77. When a sheet size 10 m × 5 m cut into small pieces of 25 cm × 20 cm, how many number of pieces will be cut:

    (A) 800   (B) 725

    (C) 1000   (D) 825

78. Area of sphere of radius "*r*" is ————————:

    (A) $2\pi r^2$ (B) $1/2\,\pi r^2$

    (C) $4\pi r^2$ (D) $3\,\pi r^2$

79. A rectangle Carpet has an area of 120 sq.m and perimeter is 46 m, the length of its diagonal is ————————.

    (A) 15 m   (B) 16 m

    (C) 17 m   (D) 20 m

80. If the ratio of the areas of the two squares is 16 : 1, the ratio of their perimeter:

    (A) 1 : 3   (B) 3 : 1

    (C) 4 : 1   (D) 1 : 6

81. The sum of interior angles of a pentagon is:

    (A) 180°   (B) 360°

    (C) 540°   (D) 720°

82. Eccentricity of parabola is:

    (A) less than 1   (B) equal to 1

    (C) greater than 1   (D) none of these

83. The trimmed size of A1 drawing sheet:

(A) 841 × 1189 mm (B) 594 × 841 mm

(C) 420 × 594 mm (D) 297 × 420 mm

84. The working edge of a drawing table is known as:

(A) Fiducial edge (B) Ebony edge

(C) Cutting edge (D) Straight edge

85. How the letters and numerals are designated?

(A) By their width (B) By their height

(C) Size of paper (D) All of these

86. Name the polygon which is bounded by 9 sides:

(A) Nonagon (B) Decagon

(C) Hexagon (D) Octagon

87. What is the name of the part of circle bounded by two radii and its arc?

(A) Circle (B) Sector

(C) Segment (D) Chord

88. The ratio between two adjacent side of the drawing sheet:

(A) $1 : \sqrt{5}$ (B) $1 : \sqrt{3}$

(C) $1 : \sqrt{2}$ (D) $1 : 1$

89. In which regular polygon sides are equal to radius of circumscribing circle:

(A) Octagon (B) Heptagon

(C) Hexagon (D) Pentagon

90. Path of a projectile is in the form of a:

(A) Ellipse (B) Hyperbola

(C) Semicircle (D) Parabola

91. A conic having only one directrix:

(A) Ellipse (B) Hyperbola

(C) Parabola (D) None of these

92. Bow compass is used for drawing:

    (A)   Big circle   (B)   Very small circle

    (C)   Parallel lines   (D)   Curves

93. The maximum number of tangents drawing to a circle from a point outside the circle:

    (A)   2   (B)   4

    (C)   8   (D) ∞

94. Acute angle is an angle:

    (A)   greater than 90°   (B)   Less than 90°

    (C)   Equal to 180°   (D)   Equal to 360°

95. Which of the following is an enlarged scale?

    (A)   n : 1   (B)   1 : n

    (C)   1 : 1   (D)   none of these

96. The following is not included in the title block of drawing sheet:

    (A)   Sheet number   (B)   Scale

    (C)   Date   (D)   Size of sheet

97. The following line is used for dimension line.

    (A)   Continuous thin   (B)   Continuous thick

    (C)   Chain thin line   (D)   None of these

98. Hatching lines are drawn at —————— to reference line.

    (A)   30°   (B)   45°

    (C)   60°   (D)   90°

99. The length : width in case of an arrow head is:

    (A)   1 : 1   (B)   2 : 1

    (C)   3 : 1   (D)   4 : 1

100. Which of the following is the most soft pencil?

    (A)   2B   (B)   1B

    (C)   HB   (D)   H

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SPACE FOR ROUGH WORK

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