

028/2023

Maximum : 100 marks

Time : 1 hour and 30 minutes

1. A car consumes fuel at the rate of one gallon for a travel of 40 miles, the same car travels a distance of 120 km. What is the consumption of fuel in liters :
- (A) 6 lit. (B) 3 lit.
(C) 7.57 lit. (D) 7.05 lit.
2. $\frac{13}{9} = \frac{1}{6} \times \text{—————}$
- (A) $\frac{12}{5}$ (B) $\frac{13}{7}$
(C) $\frac{26}{2}$ (D) $\frac{54}{3}$
3. Find the ratio of $A : B : C$, if $A : B = 2 : 3$ and $B : C = 4 : 5$.
- (A) 12 : 8 : 15 (B) 8 : 15 : 10
(C) 8 : 12 : 5 (D) 8 : 10 : 15
4. If two water pumps take 45 minutes to fill up a tank how long will 4 similar pumps will take to fill this tank?
- (A) 90 minutes (B) 11.25 minutes
(C) 45 minutes (D) 22.5 minutes
5. An iron piece weighs 160 kgf in air and 133 kgf when it is fully immersed in water. Determine the volume and specific gravity of the iron piece :
- (A) 5.93 (B) 0.16
(C) 2.20 (D) 16.8
6. 0.5 meter long bar of 30 cm diameter has a density of 8 gm/cc. Calculate the mass in kg. :
- (A) 120 kg (B) 0.282 kg
(C) 282.6 kg (D) 28.6 kg

7. The force of friction acts in a direction _____ to the direction of motion of object.
- (A) Same (B) Perpendicular
(C) Opposite (D) Downwards
8. Ohm's law is the relation between voltage (V), current (I), and resistance (R), According to which _____
- (A) $I = \frac{V}{R}$ (B) $V = \frac{I}{R}$
(C) $I = VR$ (D) $R = \frac{I}{V}$
9. The ratio of the limiting force of friction (F) to the normal reaction (R) is known as :
- (A) Coefficient of friction (B) Angle of friction
(C) Force of friction (D) None of these
10. The force of friction (F) is equal to :
- (A) $\mu R/2$ (B) μR
(C) $2\mu R$ (D) $\mu R/3$
11. A house contains 3 fans of 70 watts each, 3 CFL of 20 watts each and one refrigerator of 250 watt. The total connected load is :
- (A) 500 Watt (B) 50 Watt
(C) 520 Watt (D) 620 Watt
12. Centre of gravity is usually located where :
- (A) More weight is concentrated (B) Less weight is concentrated
(C) Less mass is concentrated (D) More mass is concentrated
13. Where the centre of gravity of circle lies?
- (A) Anywhere on its diameter (B) Anywhere on its radius
(C) Anywhere on its circumference (D) At its centre
14. The actual weight of a piece was 175 kg. But by mistake it was recorded as 155 kg. Find the percentage of error?
- (A) 1.143% (B) 1143%
(C) 114.3% (D) 11.43%

15. Bearings are made out of :
- (A) Lead alloys (B) Zinc alloys
(C) Tin and copper alloys (D) Copper alloys
16. _____ is manufactured in puddling furnace.
- (A) Pig iron (B) Cast iron
(C) Wrought iron (D) Mild steel
17. Which steel is used as cutting tool?
- (A) Nickel steel (B) Manganese steel
(C) Chromium steel (D) Tungsten steel
18. A train which leaves a station at 11.30 hrs. Arrives at 11.45 hrs. The distance between the two stations is 104 km. What is the average velocity of the train?
- (A) 32 km/hr. (B) 30 km/hr.
(C) 60 km/hr. (D) 62 km/hr.
19. An object when thrown vertically upwards reaches a maximum height of 10 meters. Find out time taken by the body to reach the height :
- (A) 1.429 sec. (B) 14 sec.
(C) 9.8 sec. (D) 6 sec
20. A body of mass 1 kg. is travelling at the speed of 1000 cm/sec. What will be its kinetic energy?
- (A) 8.8 joules (B) 0.5 joules
(C) 9 joules (D) 0.8 joules
21. Specific heat of water is :
- (A) 4200 J/kg°C. (B) 4.2 J/kg°C.
(C) 420 J/kg°C. (D) 42 J/kg°C.
22. Humidity in the atmosphere is measured by :
- (A) Manometer (B) Hydrometer
(C) Hygrometer (D) Pyrometer
23. What is 20°C in degree Kelvin?
- (A) 212°C (B) 293°C
(C) 100°C (D) 70°C

24. What is the formula for Interchange of heat?
- (A) Heat = Heat gained (B) Heat lost = Heat gained
(C) Heat lost – Heat gained (D) Heat lost \times Heat gained
25. The unit of conductance is
- (A) ohm (B) Watt
(C) mho (D) Volt
26. The area of 'Ring' portion of washer with inner radius = 13 cm. and outer radius = 15 cm. is :
- (A) 176 cm² (B) 156 cm²
(C) 170 cm² (D) 123 cm²
27. Two angles are said to be supplementary when their sum equal to :
- (A) 180° (B) 30°
(C) 45° (D) 360°
28. If perimeter of a square and equilateral triangle is equal and diagonal of square is $12\sqrt{2}$ cm. Find the area of triangle :
- (A) $24\sqrt{2}$ cm² (B) $24\sqrt{3}$ cm²
(C) $48\sqrt{3}$ cm² (D) $64\sqrt{3}$ cm²
29. Calculate the volume of sphere of 6 cm radius :
- (A) 9049 cu.cm. (B) 904.9 cu.cm
(C) 9.049 cu.cm. (D) 90.49 cu.cm
30. In machine of VR = 6 and efficiency 80%, calculate MA :
- (A) 48 (B) 4.8
(C) 34 (D) 5.6
31. Which is the example of third order lever?
- (A) Wheel barrow (B) Common balance
(C) Lemon squeezer (D) Human fore arm
32. The ratio of load lifted to effort applied is known as :
- (A) Work done (B) Velocity ratio
(C) Efficiency (D) Mechanical advantage

33. If $\cos A = 0.8$, find the value of $\sin A$:
- (A) 0.3 (B) 4.8
(C) 4.3 (D) 0.6
34. $\sin(180^\circ - \phi) = \text{—————}$
- (A) $\sin \phi$ (B) $\cos \phi$
(C) $\operatorname{cosec} \phi$ (D) $\tan \phi$
35. Two men are on the opposite side of a tower. They measure the angle of elevation of the tower as 45° and 30° respectively. If the height of the tower is 80 meter, find the distance between the men :
- (A) 212.12 metres (B) 218.13 metres
(C) 21.813 metres (D) 21.212 metres
36. What is the length of arc of a sector, whose radius is 15 cm and angle is 40° ?
- (A) 9.75 cm (B) 9.8 cm
(C) 10.60 cm (D) 10.4 cm
37. What is the name called biggest chord of the circle?
- (A) Arc (B) Diameter
(C) Radius (D) Diagonal
38. If the circumference of a circle is 44 cm, find its area? (Take $\pi = \frac{22}{7}$)
- (A) 76 cm^2 (B) 99 cm^2
(C) 70 cm^2 (D) 44 cm^2
39. The sum of three consecutive numbers is 126. Find the first number?
- (A) 42 (B) 40
(C) 43 (D) 41
40. If $\frac{p}{6} - \frac{1}{2} = \frac{p}{4} - \frac{p}{9}$, find the value of p :
- (A) 4 (B) 9
(C) 18 (D) 24

41. In order to soften the iron, Which heat treatment method is required?
(A) Normalizing (B) Annealing
(C) Tempering (D) Hardening
42. When carbon steel is heated above high critical point, and then cooled immediately, which properties of steel is enhanced?
(A) Hardness (B) Malleability
(C) Ductility (D) Elasticity
43. The steel is held for some time when it has reached the required temperature. During this the entire job gets consistently heated. This is called :
(A) Quenching (B) Soaking
(C) Heating (D) Hardening
44. What is the process for increasing toughness and decreasing brittleness?
(A) Normalizing (B) Annealing
(C) Tempering (D) Hardening
45. What is the point of material called where the flexibility ends?
(A) Young's modulus (B) Yield point
(C) Slenders ratio (D) Modulus of rigidity
46. The ratio of lateral strain and linear strain is called :
(A) Young's modulus (B) Directly proportional
(C) Poisson's ratio (D) Modulus of rigidity
47. 125 N force is applied to a wire of 10 mm diameter. Calculate the stress :
(A) 1.59 N/mm² (B) 12.5 N/mm²
(C) 78.5 N/mm² (D) 0.628 N/mm²
48. What is the term, if an article is purchased?
(A) Discount price (B) Cost price
(C) Margin price (D) Selling price
49. An article marked at Rs. 450 is sold for Rs. 396. Find discount percent :
(A) 12% (B) 83.33%
(C) 45% (D) 54%

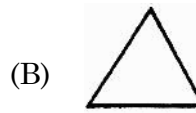
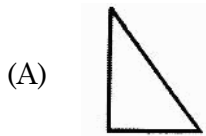
50. What is the total construction cost of a house construction area of 3000 sq.? (Cost of construction Rs. 2,000 per sq.ft. including material and labor)?
- (A) Rs. 30,000,000 (B) Rs. 60,00,000
(C) Rs. 6,00,000 (D) Rs. 60,000
51. The drawing sheet is so folded that the _____ is always on the top.
- (A) Title block (B) Conventions
(C) Letters (D) Numbers
52. The edge of drawing board on which T-square is made to slide is called its :
- (A) Working edge (B) Straight edge
(C) Chisel edge (D) None of the above
53. The section line is used to show
- (A) Rolled section of steel (B) The part cut by a cutting plane
(C) A small section of the main object (D) None of the above
54. Number of diagonals that a hexagon can have :
- (A) 4 (B) 6
(C) 9 (D) 10
55. Which of the following is the eccentricity of for ellipse?
- (A) 1 (B) $\frac{3}{2}$
(C) $\frac{2}{3}$ (D) $\frac{5}{2}$
56. Which of the following is Hyperbola Equation?
- (A) $y^2 + x^2/b^2 = 1$ (B) $x^2 = 1 ay$
(C) $x^2/a^2 - y^2/b^2 = 1$ (D) $x^2 + y^2 = 1$
57. Which shape of sharpened pencil points to be preferred for free hand sketching?
- (A) Pointed shape (B) Conical shape
(C) Taper shape (D) Round shape

58. For quick exchange of ideas among designer and technician the type of drawing used is :
- (A) Detailed drawing (B) Assembly drawing
(C) Free hand sketch (D) Operation chart
59. A free hand sketch is considered to be good when its features are shown in correct :
- (A) Proportions (B) Paper
(C) Position (D) None of the above
60. In free hand sketching, horizontal lines are drawn from :
- (A) Left to right (B) Top to bottom
(C) Right to left (D) Bottom to top
61. Outline or principal lines are drawn as :
- (A) Long and thin chain lines (B) Thick continuous line
(C) Thin continuous line (D) Dashed lines of medium thickness
62. Dimension lines, hatching and extension lines are drawn as :
- (A) Thin continuous line
(B) Thick continuous line
(C) Zigzags line
(D) Long and thin chain lines
63. Which of the following publications made by the Indian standards include standard techniques for line conventions?
- (A) BIS 9609 (B) SP46-2003
(C) ASMEV 14.2M (D) None of the above
64. Which line is used to indicate the axis of cylindrical and spherical object?
- (A) Center line (B) Border line
(C) Hidden line (D) Chain thick line
65. The lines, which are with same distance between them and they do not meet when extended are called as :
- (A) Straight lines (B) Parallel line
(C) Perpendicular line (D) Inclined line

66. Which diagram below shows a correct geometrical construction of bisecting an angle?



67. Identify the scalene triangle from the following :



68. Two opposite sides are equal and parallel and four angles are right angle are called as :

(A) Trapezium

(B) Triangle

(C) Parallelogram

(D) Rectangle

69. If a line intersects a circle at two points and does not pass through the center, the line segment inside the circle is referred as :

(A) Chord

(B) Quadrant

(C) Segment

(D) Radial line

70. What is the formula for finding the interior angle of a polygon?

(A) $\frac{(n-2)180}{n}$

(B) $(2n-4)90$

(C) $\frac{(2-n)90}{n}$

(D) $\frac{(2n-2)180}{n}$

71. The inclination of letters recommended by BIS is :

(A) 55°

(B) 65°

(C) 70°

(D) 75°

72. The types of letters used in drawing are :

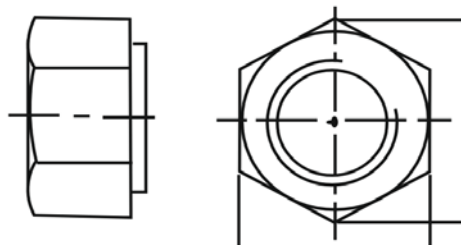
(A) Gothic

(B) Roman

(C) Italic

(D) All of the above

73. In dimension, dimensional values shall be placed parallel to their dimension line and preferably near the middle. This method of dimensioning is known as :
- (A) Unidirectional system of dimensioning
 (B) Aligned system of dimensioning
 (C) Dimensioning by co-ordinates
 (D) Dimensioning by taper parts
74. The length to width ratio of closed filled arrow head is :
- (A) 2:1 (B) 3:1
 (C) 1:3 (D) 1:2
75. The length to width ratio of drawing sheet is :
- (A) $1:\sqrt{2}$ (B) $\sqrt{2}:1$
 (C) 2:1 (D) 1:2
76. Where is the position of title block in drawing sheet?
- (A) Bottom of right hand corner (B) Bottom of left hand corner
 (C) Upper part on right hand corner (D) Bottom part on left hand corner
77. An object seen by a human eye is :
- (A) Axonometric view (B) Perspective view
 (C) Isometric view (D) Orthographic view
78. The angles that isometric lines make with each other is :
- (A) 120° (B) 45°
 (C) 90° (D) 60°
79. Identify the given figure :



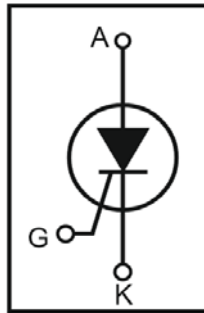
- (A) Square head bolt (B) Hexagonal bolt
 (C) Square nut (D) Hexagonal headed bolt

80. Identify the type of welded joint :



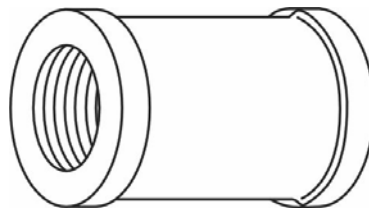
- (A) Single V butt
- (B) Double V butt
- (C) Single U butt
- (D) Double U butt

81. Read the below electrical signs or symbols :



- (A) UJT
- (B) BJT
- (C) SCR
- (D) FET

82. Identify the pipe fitting accessory :



- (A) Caps
- (B) Plug
- (C) Coupling
- (D) Reducer

83. Which is not a principle view?

- (A) Front view
- (B) Bottom view
- (C) Auxiliary view
- (D) Left side view

84. For orthographic projection BIS recommends the following :

- (A) First angle projection
- (B) Second angle projection
- (C) Third angle projection
- (D) Fourth angle projection

85. In which projection the object is put below the horizontal plane and behind the vertical plane?

- (A) Third angle projection (B) Second angle projection
 (C) First angle projection (D) Fourth angle projection

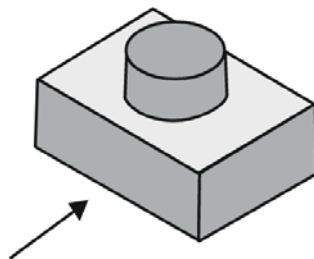
86. Which of the following is a symbol of the first angle projection?

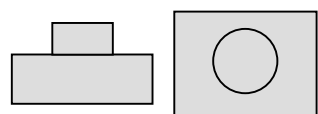
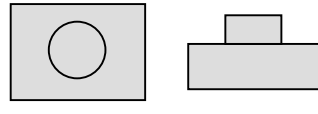
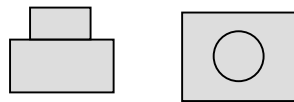
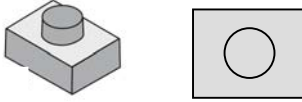
- (A)  (B) 
 (C)  (D) 

87. The isometric length is _____ % of actual length.

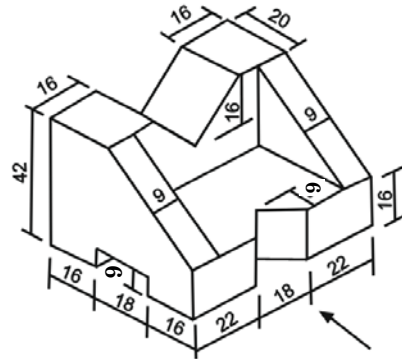
- (A) 0.85% (B) 0.82%
 (C) 0.75% (D) 0.91%

88. Identify the elevation and plan of the given object in first angle projection :



- (A)  (B) 
 front view top view top view front view
 (C)  (D) 
 side view top view top view

89. Identify the orthographic view in first angle projection :



(A) Front view Side view

(B) Front view Top view

Top view Side view

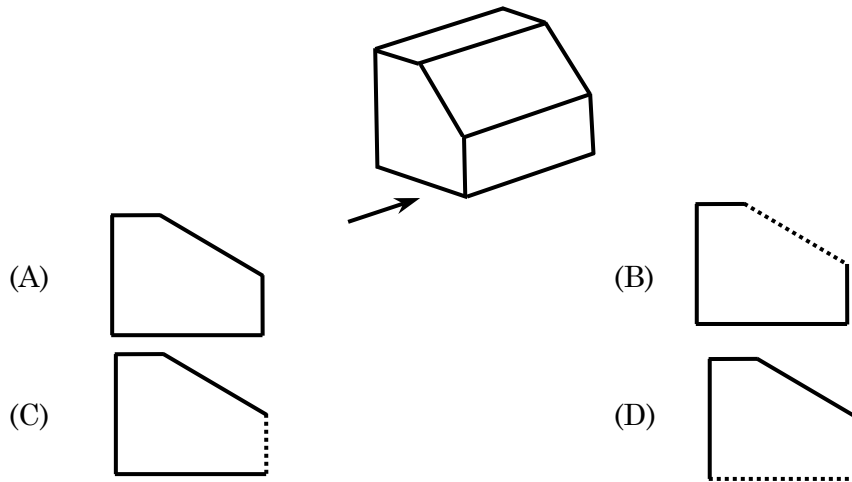
(C) Top view Side view

(D) Top view Side view

Side view Front view

Front view

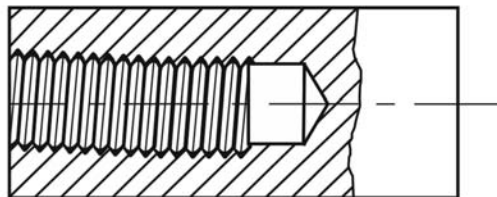
90. Identify the correct figure as per arrow shown in given isometric view of the object :



91. An area of 36 square kilometer is represented by 144 square centimeter on map. What is its RF.?

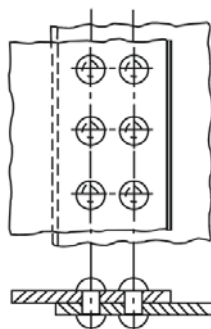
- (A) 1/50
- (B) 1/500
- (C) 1/5000
- (D) 1/50000

92. Identify the given screw thread :



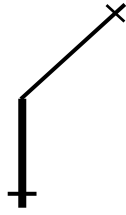
- (A) Screw thread
- (B) Internal screw thread
- (C) External screw thread
- (D) Bolt thread

93. Identify the type of rivet joint :



- (A) Double riveted (Zigzag) lap joint
- (B) Single riveted lap joint
- (C) Double riveted lap joint
- (D) Single strap butt joint

94. Identify the type of pipe joint :



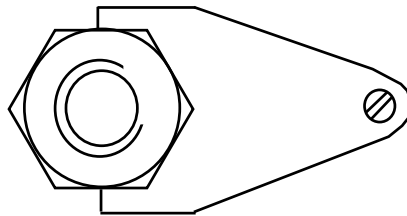
(A) Elbow 90 degree

(B) Bend 90 degree

(C) Bend 45 degree

(D) Elbow 45 degree

95. Identify the given figure :



(A) Locking slot

(B) Split pin

(C) Washers

(D) Locking plate

96. Which gear is used in sliding machines?

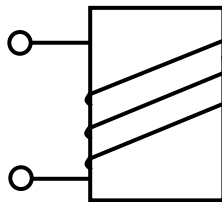
(A) Rack and Pinion gear

(B) Bevel gear

(C) Hypont gear

(D) Worm gear

97. Read the below Electrical signs or symbols :



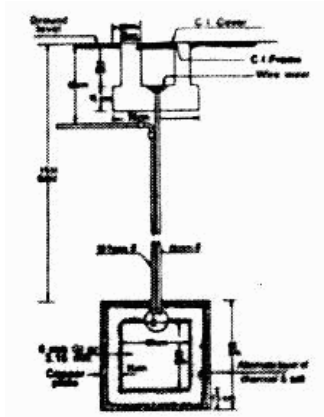
(A) Electric bell

(B) Choke

(C) Transformer

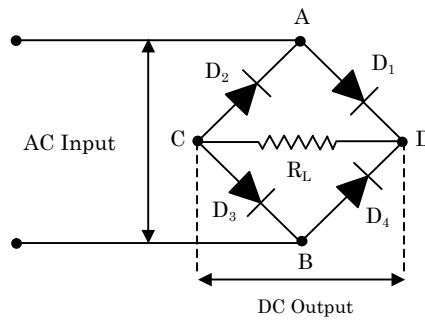
(D) Electromagnet

98. Identify the below earthing diagram :



- (A) Plate earthing diagram (B) Pipe earthing diagram
 (C) Plate and Pipe earthing diagram (D) None of the above

99. Identify the following circuit diagram :



- (A) Half wave rectifier (B) Full wave rectifier circuit
 (C) Full wave bridge rectifier (D) None of the above

100. Which of the following is the ISI symbol for Photo diode?

- (A) (B)
- (C) (D)

SPACE FOR ROUGH WORK

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