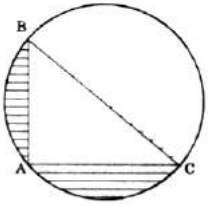
SECTION – I
Straight Objective Type

This section contains multiple choice questions. Each question has four choice (a), (b), (c), (d) out of which ONLY ONE is correct.

1. The area of rhombus, one side of which measures 25 cm and diagonal 30 cm is
(a) 600 sq. cm (b) 250 sq. cm
(c) 200 sq. cm (d) 150 sq. cm

2. The cross-section of a canal is a trapelium in shape. If the canal is 8 m wide at the top and 6 m wide at the bottom and the area of cross-sections is 644 sqm., then the length of the canal is
(a) 90 m (b) 92 m (c) 94 m (d) 96 m

3. If BC passes through the center of the circle, then the area of the shaded region in the given figure is



(a) $\frac{a^2}{2}(3-\pi)$ (b) $a^2\left(\frac{\pi}{2}+1\right)$ (c) $2a^2(\pi-1)$ (d) $\frac{a^2}{2}\left(\frac{\pi}{2}-1\right)$

4. If the sides of a triangle are doubled then its area
(a) remains the same (b) becomes doubled
(c) becomes three times (d) becomes four times

5. The base of a triangle is 15 dm and its height is 12 dm. The height of another triangle of double the area and the base of which is 20 dm is given by
(a) 9 dm (b) 18 dm (c) 8 dm (d) 12.5 dm

6. In a right angled triangle whose sides are x and y and hypotenuse l, the altitude drawn on the hypotenuse is a then,

(a) $xy = a^2$ (b) $\frac{1}{x} + \frac{1}{y} = \frac{1}{a}$

(c) $x^2 + y^2 = 2a^2$ (d) $\frac{1}{x^2} + \frac{1}{y^2} = \frac{1}{a^2}$

7. The diagonal of a square A is $(x + y)$. The diagonal of a Square B with twice the area of A is

(a) $\sqrt{2}(x+y)$ (b) $2(x+y)$

(c) $2x+4y$ (d) $4x+2y$

8. A circle and a square have the same perimeter then

(a) Their areas are equal

(b) The area of the circle is greater

(c) The area of the square is greater

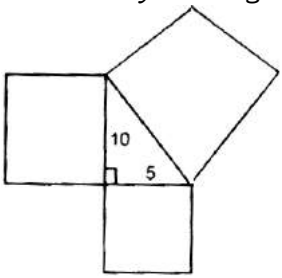
(d) None of the above

9. The area of a right angled triangle is 20 sq. cm. and one of the sides containing the right angle is 4 cm. The altitude on the hypotenuse is

(a) $\frac{20}{\sqrt{29}} cm$ (b) $8 cm$

(c) $10 cm$ (d) $\sqrt{\frac{40}{47}} cm$

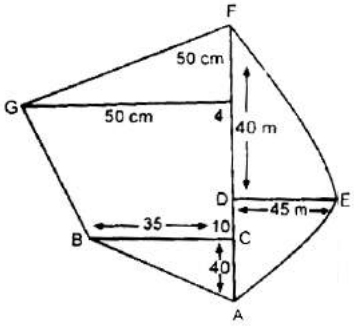
10. Squares are constructed on the outer side of a right angled triangle on each of its three sides. If the length of the two sides containing the right angle are 5 cm and 10 cm respectively. Then the total area of the region bounded by the diagram is



(a) 250 sq. cm (b) 200 sq. cm

(c) 300 sq. cm (d) 275 sq. cm

11. Area of the field ABGFE is



(a) 7225 m^2 (b) 7230 m^2 (c) 7235 m^2 (d) 7240 m^2

12. The total surface area of the cube is 216 sq. cm. The length of the longest pole that can be kept inside the cube is

(a) $6\sqrt{3}$ (b) 6 (c) 8 (d) $7\sqrt{3}$

13. A square and an equilateral triangle have equal perimeters. If the diagonal of the square is $6\sqrt{2}$ cm then the area of the triangle is

(a) $16\sqrt{2}\,cm^2$ (b) $16\sqrt{3}\,cm^2$ (c) $12\sqrt{2}\,cm^2$ (d) $12\sqrt{3}\,cm^2$

14. The height of a conical tent at the centre is 5m. The distance of any point on its circular base from the top of the tent is 13m. The area of the slant surface is

(a) 144 sq. m (b) 130 π sq. m

(c) 156 π sq. m (d) 169 π sq. cm

15. The area of curved. surface of a right cone of diameter 14 cm is 560 cm^2. The height of the cone is

(a) 25 cm (b) 22 cm (c) 23 cm (d) 24 cm

16. A right pyramid is on a regular hexagonal base. Each side of the base is 10m. Its height is 60 m. The volume of the pyramid is

(a) 5196 m^3 (b) 5200 m^3 (c) 6210 m^3 (d) 6510 m^3

17. A cone whose height is 15 cm and radius of base is 6 cm is trimmed sufficiently to reduce it to a pyramid whose base is an equilateral triangle. The volume of the portion of removed is

(a) 325 cm^3 (b) 328 cm^3 (c) 330 cm^3 (d) 331 cm^3

18. If the radius of the circle is increased by 100%. Then the area is increased by

(a) 100% (b) 200% (c) 300% (d) 400%

19. A square ABCD is inscribed in a circle of radius a. Another circle is inscribed in ABCD and a square EFGH is inscribed in this circle. The side EF is equal to

(a) a (b) $a\sqrt{2}$ (c) $\frac{a}{\sqrt{2}}$ (d) $\frac{a}{2}$

20. Inside a triangular garden there is a flower bed in the form of a similar triangle. Around the flower bed runs a uniform path of such a width that the sides of the garden are double of the corresponding sides of the flower bed. The areas of the path and flower bed are in the ratio.

(a) 1 : 1 (b) 1 : 2 (c) 1 : 3 (d) 3 : 1

21. If a solid right circular cylinder made of iron is heated to increase its radius and height by 1 P.C ech, then the volume of the solid is increased by

(a) 1.01 P. C (b) 3.03 P. C (c) 2.01 P. C (d) 1.2 P. C

22. The radius of a piece of wire is decreased to one-half. If volume remains the same, its length will increase

(a) 2 times (b) 3 times (c) 4 times (d) 5 times

23. A wire bent into the shape of an equilateral triangle encloses an area 5 sq. cm. If the same wire is bent to form a circle, the area of the circle will be

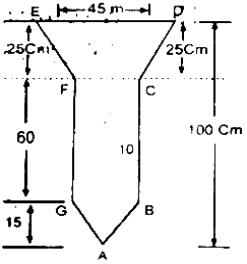
(a) $\frac{\pi S^2}{9}$ (b) $\frac{3S^2}{\pi}$ (c) $\frac{33}{\pi}$ (d) $\frac{3\sqrt{3}S}{\pi}$

24. The length and breadth of a room are in the ratio 3 : 2. If the height is equal to half of its length. If the cost of carpetting the floor at Rs. 400 per m^2 is Rs. 216.

Then the area of four walls (in m^2) is

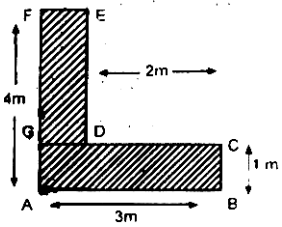
(a) 135 (b) 140 (c) 125 (d) 120

25. The area of the space occupied by figure ABCDEFG is



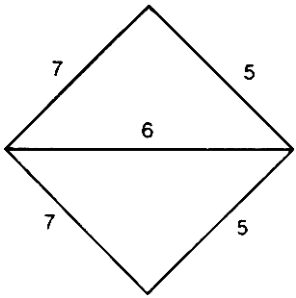
(a) 1175 cm^2 (b) 1185 cm^2 (c) 1195 cm^2 (d) 1199 cm^2

26. Area of shaded portion as shown in the given figure is



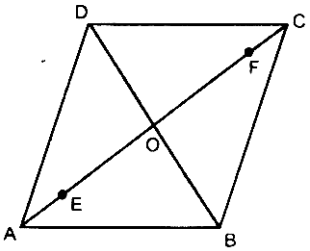
(a) 5 m^2 (b) 6 m^2 (c) 7 m^2 (d) 8 m^2

27. The lengths of four sides and a diagonal of the given quadrilateral are indicated in the diagram. If A denotes the area and (is the length of the other diagonal, then A and *l* are respectively



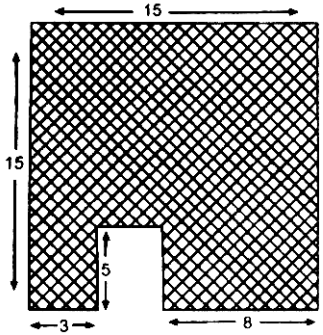
(a) $12\sqrt{6}, 4\sqrt{6}$ (b) $12\sqrt{6}, 5\sqrt{6}$ (c) $6\sqrt{6}, 4\sqrt{6}$ (d) $6\sqrt{6}, 5\sqrt{6}$

28. If ABCD is a parallelogram and E, F the entroids of triangles ABD and BCD respectively, then EF equals



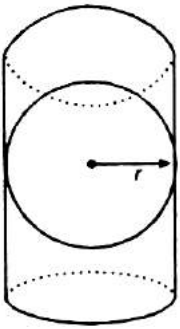
(a) AE (b) BE (c) CE (d) DE

29. The area of the shaded region is



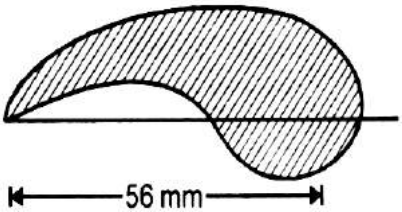
(a) $150 cm^2$ (b) $140 cm^2$ (c) $205 cm^2$ (d) $120 cm^2$

30. A sphere of radius 'r' is inscribed in the cylinder such that the curved surface of the sphere touches the cylinder as shown in the given figure. The area of curved surface of cylinder is



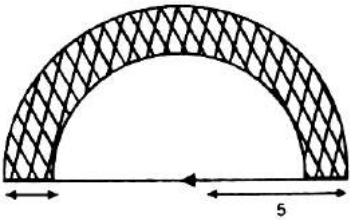
(a) $\frac{4}{3}\pi r^2$ (b) $4\pi r^2$ (c) πr^2 (d) $2\pi r^2$

31. The length of the boundary of the shaded region in the adjoining figure is



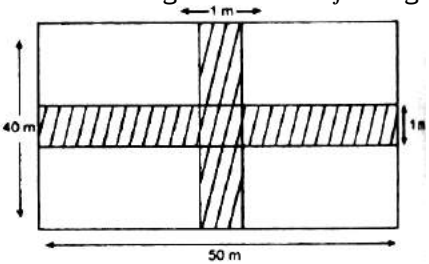
(a) 200 mm (b) 196 mm (c) 186 mm (d) 176 mm

32. The area of the shaded portion in the given figure is



(a) 4.5 π sq. units (b) 6.6 π sq. units
(c) 5.5 π sq. units (d) 4.5 π sq. units

33. The area of the shaded region in the adjoining figure is



(a) 2000 m^2 (b) 90 m^2 (c) 45 m^2 (d) 89 m^2

SECTION - II
Assertion - Reason Questions

This section contains 12 questions. Each question contains STATEMENT-1 (Assertion) and STATEMENT-2 (Reason). Each question has 4 choices (a), (b), (c) and (d) out of which ONLY ONE is correct.

34. STATEMENT-1: The radii of the bases of two cones are r_1 and r_2 slant heights are s_1 and s_2.

because

STATEMENT-2: Then the ratio of their L.S.A are $r_1 s_1 : r_2 s_2$. If the heights of two cones are equal then their volumes are in the ratio of squares of their radii.

(a) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1

(b) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1

(c) Statement-1 True, Statement-2 is False

(d) Statement-1 is False, Statement-2 is True

35. STATEMENT-1: Slant height $l^2 = r^2 + h^2$

because

STATEMENT-2: Area of the base of a cone $= \pi r^2$

(a) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1

(b) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1

(c) Statement-1 True, Statement-2 is False

(d) Statement-1 is False, Statement-2 is True

36. STATEMENT-1: Volume of the sphere is $\frac{4}{3}\pi r^3$

because

STATEMENT-2: Area of the ring $= \pi(r^2 - s^2)$

(a) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation of statement-1

(b) Statement-1 True, Statement-2 is True; Statement-2 is not a correct explanation for Statement-1
(c) Statement-1 True, Statement-2 is False
(d) Statement-1 is False, Statement-2 is True

37. STATEMENT-1: Area of the ring edge of hollow hemisphere $=\pi(R^2-r^2)$

because

STATEMENT-2: Surface area of hollow sphere $\pi(3R^2+r^2)$

(a) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1
(b) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1
(c) Statement-1 True, Statement-2 is False
(d) Statement-1 is False, Statement-2 is True

38. STATEMENT-1: L.S.A of a cube $=4a^2$

because

STATEMENT-2: T.S.A of a cube $=6a^2$

(a) Statement-1 is True, Statement-2 is True; Statement-2 Is a correct explanation for Statement-1
(b) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1
(c) Statement-1 True, Statement-2 is False
(d) Statement-1 is False, Statement-2 is True

39. STATEMENT-1: T.S.A of a cuboid $=2(lh+bh+lb)$

because

STATEMENT-2: Volume of a cuboid $=lbh$

(a) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1
(b) Statement-1 is True, Statement-2 is True; Statement-2 18 NOT a correct explanation for Statement-1
(c) Statement-1 True, Statement-2 is False
(d) Statement-1 is False, Statement-2 is True

40. STATEMENT-1: L.S.A of a triangular priaim $= ph$

because

STATEMENT-2: Area of the base of the triangular prism is $\sqrt{S(S-a)(S-b)(S-c)}$

(a) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1

(b) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1

(c) Statement-1 True, Statement-2 is False

(d) Statement-1 is False, Statement-2 is True

41. STATEMENT-1: The base of a prism is rhombus with diagonels 28 cm, 96 cm. Height of the prism is 32 cm. Then the volume is $43008\ cm^3$.

because

STATEMENT-2: Volume of the prism $V = A \times h$

(a) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1

(b) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1

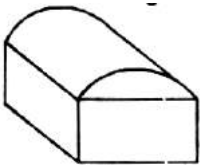
(c) Statement-1 True, Statement-2 is False

(d) Statement-1 is False, Statement-2 is True

42. STATEMENT-1: Volume of masnory = Area of cross section x length

because

STATEMENT-2: Area of cross section = Area of rectangle + Area of semi-circle



(a) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1

(b) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1

(c) Statement-1 True, Statement-2 is False

(d) Statement-1 is False, Statement-2 is True

43. STATEMENT-1: Diagonal of a cuboid $= \sqrt{l^2 + b^2 + h^2}$

because

STATEMENT-2: Sum of the edges of a cuboid $= 4(l + b + h)$

(a) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1

(b) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1

(c) Statement-1 True, Statement-2 is False

(d) Statement-1 is False, Statement-2 is True

44. STATEMENT-1 : L.S.A of triangular prism of sides 15 cm, 20 cm and 25 cm with height 40 cm is 2400 sq. cm

because

STATEMENT-2: Perimeter of the base of prism is 60 cm.

(a) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1

(b) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1

(c) Statement-1 True, Statement-2 is False

(d) Statement-1 is False, Statement-2 is True

45. STATEMENT-1: Volume of a regular hexagonal prism of side 30 cm and height 6 cm is 14029.2 cc

because

STATEMENT-2: Volume = Area of base $\times$ height

(a) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1

(b) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1

(c) Statement-1 True, Statement-2 is False

(d) Statement-1 is False, Statement-2 is True

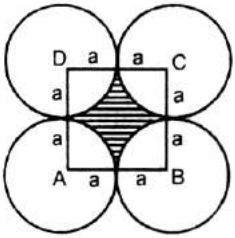
SECTION - III
Linked Comprehension Type

This section contains 4 paragraphs. Based upon each paragraph 3 multiple choice questions have to be answered. Each question has 4 choices (a), (b), (c) and (d), out of which ONLY ONE is correct.

Paragraph for Question Nos. 46 to 48

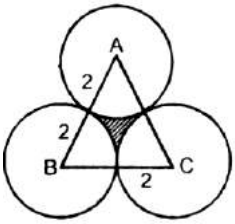
A sector of a circle is that part of the circle which is contained by radio and an arc. Area of a sector $= \pi r^2 \times \frac{\theta}{360^o}$. Then

46. Four equal circles, each of radius '*a*' touch one another. Then the area bounded by them is



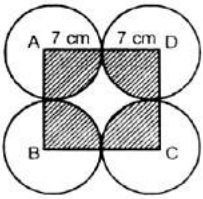
(a) $\frac{6a^2}{7}$ (b) $\frac{3a^2}{7}$ (c) $\frac{4a^2}{7}$ (d) a^2

47. Three equal circles. Each of radius 'a' touch one another. Then the area of the space enclosed between them is



(a) $6.928 cm^2$ (b) $0.642 cm^2$ (c) $1.732 cm^2$ (d) $154 cm^2$

48. Four equal circles are described about the four corners of a square so that each circle touches two of the others. The area of the space enclosed between the circumference of the circle.



(a) 42 cm^2 (b) 56 cm^2 (c) 48 cm^2 (d) 45 cm^2

Paragraph for Question Nos. 49 to 51

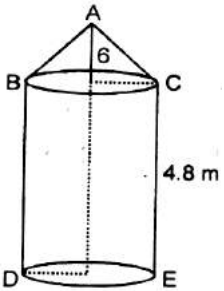
If l is slant height, r is radius of the base of cone, h is weight of the cone then curved surface area of a cone

$$= \pi r\sqrt{r^2 + h^2}$$

Total surface area of the cone $= \pi r\left(\sqrt{r^2 + h^2} + r\right)$

$$\text{Volume} = \frac{1}{3}\pi r^2 h$$

A circus tent is in the form of a cone over a cylinder. The diametre of the base is 9 mts and the height of the cylindrical part is 4.8 mts. and the total height of tent is 10.8 m. Then



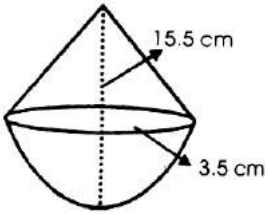
49. Slant height of the cone is
(a) 7.6 mts (b) 4.8 mts (c) 4.6 mts (d) 2.7 mts

50. Canvas required for conical portion of tent is
(a) 98.74 (b) 106.071 (c) 66.74 (d) 78.56

51. Convas required for the cylindried part of the tent is
(a) 241.84 m^2 (b) 246.24 m^2 (c) 198.56 m^2 (d) 98.72 m^2

Paragraph for Question Nos. 52 to 55

A top (toy) is of the shape of a cone over a hemisphere. The radius of the hemisphere is 3.5 cm. The total height of top is 15.5 cm then



52. Curved surface area is

(a) 137.5 cm^2 (b) 7750 cm^2 (c) 214.5 cm^2 (d) 78 cm^2

53. Curved surface area of the hemisphere is

(a) 137.5 cm^2 (b) 77 cm^2 (c) 214.5 cm^2 (d) 78 cm^2

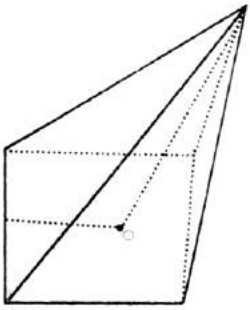
54. Total surface area of the top is

(a) 137.5 cm^2 (b) 77 cm^2 (c) 214.5 cm^2 (d) 78 cm^2

Paragraph for Question Nos. 56 to 58

The triangle meet at a common point called the vertex and the length of the perpendicular segment from the vertex to its base is called the height of the pyramid.

The base of a right pyramid is a square of side 10 cm. If the height of the pyramid is 126 m then



55. The slant *n* height is

(a) 13 cm (b) 15 cm (c) 17 cm (d) 8 cm

56. Lateral surface area of is

(a) 260 cm^2 (b) 240 cm^2 (c) 280 cm^2 (d) 175 cm^2

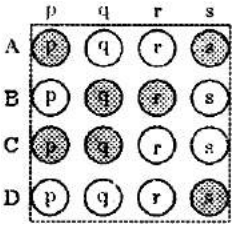
57. Volume of the pyramid is

(a) 300 c.c (b) 200 c.c (c) 400 c.c (d) 500 c.c

SECTION – IV
Matrix - Match Type

This section contains certain questions. Each question contains statement given in two columns, which have to be matched. Statements (A, B, C, D) in Column I have to be matched with statements (p, q, r, s) in Column II. The answers to these questions have to be appropriately bubbled as illustrated in the following example.

If the correct matches are A - p, A - s, B - q, B - r, C - p, C - q and D – s then the correctly bubbled 4 x 4 matrix should be as follows :



58. For a triangular prism

Column I	**Column II**
(a) Ph Sq units	(p) Number of edges
(b) Area of the triangle	(q) Area of the base
(c) Ph + 2× area of the triangular base	(r) Total surface area
(d) Number of sides ×3	(s) Lateral surface area

59. Formulae of Area

Column I	**Column II**

(a) $\frac{1}{2}d_1d_2$ (p) Rhombus

(b) $\left(\frac{a+b}{2}\right)^h$ (q) Quadrilateral

(c) $\frac{1}{2}d(h_1+h_2)$ (r) Trapelium

(d) bh (s) Parallelogram

60.

Column I	**Column II**
(a) The diagonals bisect each other perpendicularly but are not equal	(p) Rectangle
(b) The diagonals bisect each other perpendicularly and are equal	(q) Square
(c) The diagonals bisect each other and are not equal	(r) Parallelogram
(d) Diagonals bisect-each other and are equal	(s) Rhombus

61. Measurements of aides and angles of a triangle

Column I	**Column II**
(a) 7 cm, 7 cm, 7 cm	(p) Equilateral triangle
(b) 4 cm, 5 cm, 6 cm	(q) Isoscales triangle
(c) $45^o, 45^o, 90^o$	(r) Right angled isoscales triangle
(d) $50^o, 50^o, 80^o$	(s) Scalene triangle

62.

Column I	**Column II**
(a) 2 (l + b)	(p) Area of a rectangle
(b) a^2	(q) Area of a square
(c) lb	(r) Perimeter of a Rectangle
(d) 4 a	(s) Perimeter of a square

63. Formulae of Area

Column I	**Column II**
(a) Area of a sectorp	(p) l + 2r

(b) Length of an arc of a sector (q) $\frac{lr}{2}$

(c) Perimeter of a sector (r) $\frac{x^o}{360^o} \times \pi r^2$

(d) If I is length of arc then area is (s) $\frac{x^o}{360^o} \times 2\pi r$