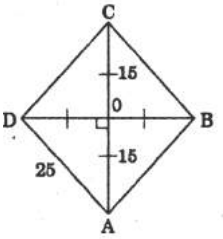
SECTION - I
Straight Objective Type

1.



Area of rhombus

$$= \frac{1}{2} d_1 d_2$$

$$= \frac{1}{2} \times 30 \times d_2$$

$$OD^2 = 25^2 - 15^2$$

$$= 625 - 255 \quad \Rightarrow \quad d_2 = 2 \times OD$$

$$= 400 \qquad\qquad = 2 \times 20$$

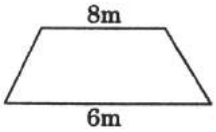
$$OD = 20 = 40$$

$\Rightarrow$ Area of rhombus $= \frac{1}{2} \times 30 \times 40$

$$= 30 \times 20 = 600 sq.cm$$

Hence (a) is the correct option.

2.



Area of the trapezium

$$= \frac{h}{2}(a+b)$$

$$644 = \frac{h}{2}(8+6)$$

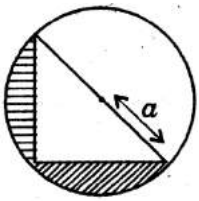
$$644 \times 2 = 14h$$

$$\Rightarrow \quad h = \frac{644 \times 2}{14} = 46 \times 2 = 92m$$

The length of the canal = 92 m.

Hence (b) is the correct option.

3. Area of the shaded portion $= \frac{a^2}{2}\left(\frac{\pi}{2} - 1\right)$



Hence (d) is the correct option.

4. Area of the triangle

$$\Delta_1 = \sqrt{s(s-a)(s-b)(s-c)}$$

where $s = \frac{a+b+c}{2}$

If the sides of a triangle are doubled

$$s^1 = \frac{2a+2b+2c}{2} = \frac{2(a+b+b)}{2} = 2s$$

$$\Delta^1 = \sqrt{s^1(s^1-2a)(s^1-2b)(s^1-2c)}$$

$$= \sqrt{2s(2s-2a)(2s-2b)(2s-2c)}$$

$$= \sqrt{16.s(s-a)(s-b)(s-c)}$$

$$\Rightarrow \quad = 4\sqrt{s(s-a)(s-b)(s-c)}$$

$$= 4\Delta$$

The area becomes four times

Hence (d) is the correct option

5. $b_1 = 15dm$

$h_1 = 12dm$

$A_1 = \frac{1}{2} b_1 h_1$

$= \frac{1}{2} \times 15 \times 12$

$= 90dm^2$

$A_2 = 180dm_2$

$b_2 = 20\,dn$

$h_2 = ?$

$A_2 = \frac{1}{2} b_2 h_2$

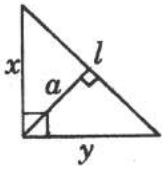
$180 = \frac{1}{2} \times 20 \times h_2$

$\frac{180}{10} = h_2$

$\Rightarrow \quad h_2 = 18dm$

Hence (b) is the correct option.

6.



Area of the triangle $= \frac{1}{2} al = \frac{1}{2} xy$

$\Rightarrow \quad xy = al$

$l^2 = x^2 + y^2$ ($\because$ Pythagoras theorem)

$$\frac{1}{x^2}+\frac{1}{y^2}=\frac{x^2+y^2}{(xy)^2}=\frac{l^2}{(al)^2}$$

$$=\frac{l^2}{a^2l^2}=\frac{1}{a^2}$$

$\Rightarrow$ $$\frac{1}{x^2}+\frac{1}{y^2}=\frac{1}{a^2}$$

Hence (d) is the correct option.

7. $D_1=(x+y)$

$$A_1=\frac{D_1^2}{2}$$

$$=\frac{(x+y)^2}{2}$$

$$D_2=D_2$$

$$A_2=2A_1$$

$$=2.\frac{(x+y)^2}{2}$$

i.e., $$\frac{D_2^2}{2}=(x+y)^2$$

$\Rightarrow$ $D_2^2=2(x+y)^2$

$\Rightarrow$ $D_2=\sqrt{2}(x+y)$

The diagonal of a square B with twice the area of $A=\sqrt{2}(x+y)$

Hence (a) is the correct option.

8. A circle and square have the same polimeter then

$2\pi r=4a$

$\Rightarrow$ $\pi r=2a$

$\Rightarrow$ $$a=\frac{\pi r}{2}$$

Area of the square = a^2

Area of the circle $= \pi r^2$

$$a^2 = \left(\frac{\pi r}{2}\right)^2 = \frac{\pi^2 r^2}{4} = \left(\pi r^2\right).\frac{\pi}{4}$$

$$\frac{\pi}{4} = \frac{22}{28} < 1 \text{ i.e., } \frac{\pi}{4} < 1$$

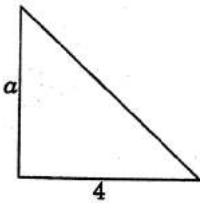
$\Rightarrow \quad \left(\pi r^2\right).\frac{\pi}{4} < \pi r^2$

$\Rightarrow \quad a^2 < \pi r^2$

Area of the square < Area of the circle

Hence (b) is the correct option.

9.



Area of the right angles triangle = 20 sq. cm

$\Rightarrow \quad A = \frac{1}{2}ab$

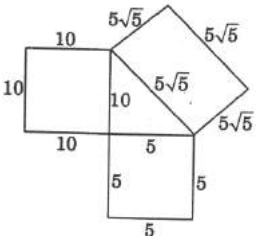
$$20 = \frac{1}{2} \times a \times 4$$

$\Rightarrow \quad 2a = 20$

$\Rightarrow \quad a = 10cm$

Hence (c) is the correct option.

10.



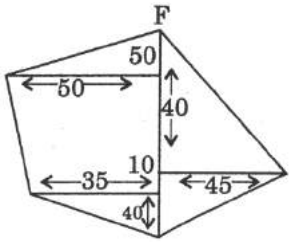
Total Area

$$=10^2+^2+\left(5\sqrt{5}\right)^2+\frac{1}{2}\times10\times5$$

$$=100+25+125+25=275$$

Hence (d) is the correct option.

11.



Total Area

$$=\frac{1}{2}\times35\times40+\frac{1}{2}\times90\times45+\frac{1}{2}\times40\times45$$

$$+\frac{1}{2}\times50\times50+\frac{1}{2}\times50\left(50+35\right)$$

$$=700+2025+900+1250+2975$$

$$=7225m^2$$

Hence (a) is the correct option.

12. Total surface area of a cube $=216cm^2$

$$6a^2=216$$

$\Rightarrow$ $a^2=36$

$a=6m$

The length of the longest pole that can be inside the cube $=\sqrt{3}a$

$$=\sqrt{36}$$

$$=6\sqrt{3}$$

Hence (a) is the correct option.

13. Perimeter of square = perimeter of equilateral triangle

$4a = 3b$

Where a is the length of the side of the square and b is the length of the side of the equilateral triangle

Diagonal of the square $= 6\sqrt{2}cm$

$\sqrt{2}a = 6\sqrt{2}$

$\Rightarrow \quad a = 6cm$

$b = \frac{4}{3}a$

$= \frac{4}{3} \times 6 = 8cm$

Area of the equilateral triangle

$= \frac{\sqrt{3}}{4}a^2$

$= \frac{\sqrt{3}}{4} \times (8)^2$

$= \frac{\sqrt{3}}{4} \times 64 = 16\sqrt{3}cm^2$

Hence (b) is the correct option.

14. The height of a comical text at the centre is 5m. The distance of any point on its circular base from the top of the text is 13 m. The area of the slant surface is $156\pi sq.m$

Hence (c) is the correct option.

15. Curved surface area of a cone

$= \pi r\sqrt{r^2 + h^2} \quad d = 14cm$

$550 = \frac{22}{7} \times 7\left(\sqrt{7^2 + h^2}\right) \quad r = 7cm$

$\frac{550}{22} = \sqrt{h^2 + 7^2}$

$\frac{50}{2} = \sqrt{49 + h^2}$

$$25 = \sqrt{49 + h^2}$$

$\Rightarrow$ $625 = 49 + h^2$

$\Rightarrow$ $h^2 = 576$

$h = 24cm$

Hence (d) is the correct option.

16. Volume of the right pyramid

$$= \frac{1}{3}(\text{area of the base}) \times (\text{height})$$

$$= \frac{1}{3}.\left(6 \times \frac{\sqrt{3}}{4} \times 10^2\right) \times 60$$

$$= \frac{100\sqrt{3} \times \overset{30}{\cancel{60}}}{\cancel{2}} = 3000\sqrt{3}$$

$$= 3000 \times 1.73 = 5196m^2$$

Hence (a) is the correct option.

17. Height = 15 cm

radius = 6 cm

Volume of the pyramid

$$= \frac{1}{3} \times \text{Area of the base} \times \text{height}$$

$$= \frac{1}{3} \times \frac{\sqrt{3}}{4} \times 6^2 \times 15 = 331cm^3$$

Hence (d) is the correct option.

18. $r_1 = r$

$A_1 = A = \pi r^2$

$r_2 = 2r$

$A_2 = \pi(2r)^2$

$= 4\pi r^2$

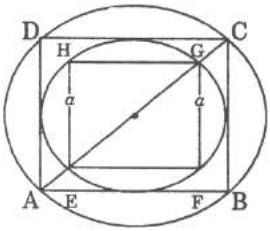
$= 4A_1$

The percentage of increase in Area

$= \frac{4A_1 - A_1}{A_1} \times 100 = 300\%$

Hence (c) is the correct option.

19.



The diameter of outer circle = diagonal of A B C D

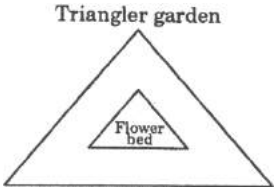
$= 2a$

$\Rightarrow$ Length of the side of E F G H

$= \frac{\sqrt{2}a}{\sqrt{2}} = a$

Hence (a) is the correct option.

20.



The ratio areas of the path and flower bed are in the ratio = 3 : 1

Hence (d) is the correct option.

21. If a solid right circular cylinder made of iron is heated to increase its radius and height 1 E C each them the volume of the solid increased to 2.01 PC

Hence (c) is the correct option.

22. The radius of a piece of wire decreased to one-half. If volume remains same, its length will increase 4 times.
Hence (c) is the correct option.

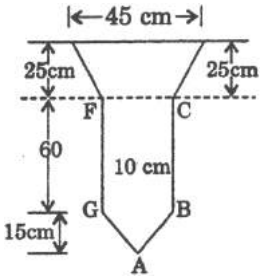
23. A wire bent into the shape of an equilateral triangle encloses an area 5 sq.cm. If the same wire is bent to form a circle, the area of the circle will

$be = \frac{3\sqrt{3}s}{\pi}$

Hence (d) is the correct option.

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 ₹ 4.00 per m^2 is ₹ 216.00. Then the area of the four walls is $135m^2$.
Since area of the four walls
$= 2h(1+b)$
Hence (a) is the correct option-

25.



Area of the Trapezium F C D E
$= \frac{1}{2} \times (10+45)25$
Area of the triangle G A B
$= \frac{1}{2} \times 15 \times 10$

Area of the rectangle G B C F

$= 60 \times 10$

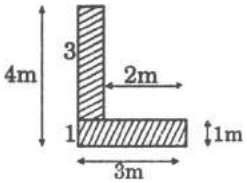
$\therefore$ Total Area

$= \frac{1}{2} \times 55 \times 25 + \frac{1}{2} \times 15 \times 10 + 60 \times 10$

$= 1175 cm^2$

Hence (a) is the correct option.

26.

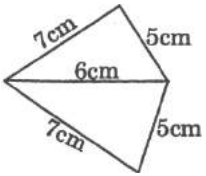


Area of the shaded region

$= 3 \times + 3 \times 1 = 6 m^2$

Hence (b) is the correct option.

27.

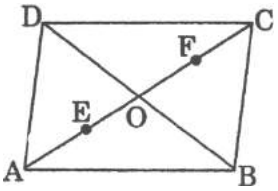


Area of the Quadrilateral $= 12\sqrt{6}$

Length of the other diagonal $= 4\sqrt{6}$

Hence (a) is the correct option.

28.



E is the centroid of ΔABD

F is the centroid of ΔBCD

$AO = OC$

($\because$ A B C D is a parallelogram)

$\frac{1}{3}OA = \frac{1}{3}OC$

$\Rightarrow \quad OE = OF \Rightarrow \quad EF = 2OE$

$= 2.\left(\frac{1}{3}OA\right)$

$= \frac{2}{3}.OA$

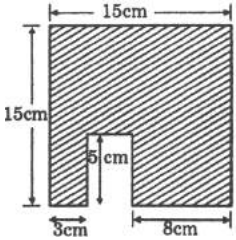
$= \frac{2}{3}\left(\frac{1}{2}AC\right)$

$= \frac{1}{3}AC$

$= AE$

$\Rightarrow$ Hence (a) is the correct option.

29.



Area of the shaded region

$= 15 \times 15 - 4 \times 5$

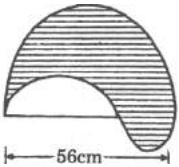
$= 225 - 20 = 205 cm^2$

Hence (c) is the correct option.

30. The area of the curved surface of cylinder is $= 4\pi r^2$

Hence (b) is the correct option.

31.



Diameter of semi circle = 56 mm

Radius of the semi circle = 28 mm

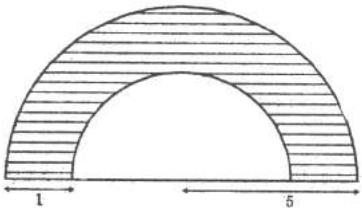
$\Rightarrow$ The area of the shaded region

$$=\frac{22}{7}\times\frac{28\times 28}{2}$$

$$=11\times 4\times 28=176mm$$

Hence (d) is the correct option.

32.



$R=5$

$r=4$

Area of the shaded region

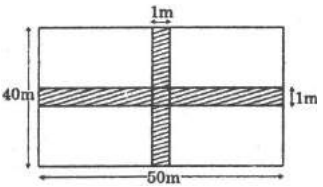
$$=\frac{1}{2}\pi\left(R^2-r^2\right)$$

$$=\frac{1}{2}\times\frac{22}{7}\left(5^2-4^2\right)$$

$$=11\times 4\times 28=176mm$$

Hence (d) is the correct option.

33.



Area of the shaded region

$=50\times1+40\times1-1\times1$

$=90-1=89m^2$

Hence (d) is the correct option.

SECTION - II

Assertion - Reason Questions

34. The radii of the bases of two cones are r_1 and r_2 slant height are s_1 and s_2 then the ratio of their I.S.A are $r_1s_1 : r_2s_2$ Since if the heights of two cones are equal then

Their volumes are in the ratio of squares of their radii.

Hence (d) is the correct option.

35. Slant height of a cone $l^2 = r^2 + h^2$

Area of the base if cone $= \pi r^2$

Hence (c) is the correct option.

36. Volume of the sphere $= \frac{4}{3}\pi r^3$

Area of the ring $= \pi\left(R^2 - r^2\right)$

Where R is radius of outer circle r is the radius of inner circle

Hence (b) is the correct option.

37. Area of the ring edge of hollow hemisphere

$= \pi\left(R^2 - r^2\right)$

Surface area of the hollow sphere

$= \pi\left(3R^2 + r^2\right)$

Hence (a) is the correct option.

38. Lateral surface area of a cube $= 4a^2$

Total surface are of cube

$= 6a^2 = 4a^2 + 4a^2$

Hence (a) is the correct option.

39. Volume of the cuboid $= lbh$

Total surface area $= 2)lh + bh + lb)$

Hence (b) is the correct option.

40. L.S.A of triangular prisim = ph

Area of the base of the triangular prism is $\sqrt{s(s-a)(s-b)(s-c)}$

Hence (b) is the correct option.

41. The volume of the prism

$= \frac{1}{3} \times \left(\frac{1}{2} \times 28 \times 96\right) \times 32$

$= 43008 cm^3$

Volume of the prism $V = A \times h$

Hence (a) is the correct option.

42. Volume of the Masnory = Area of the cross section × length

Hence (a) is the correct option.

43. Diagonals k of a cuboid $= \sqrt{l^2 + b^2 + h^2}$

Sum of the edges of a cuboid

$= 4\left(l + b + h\right)$

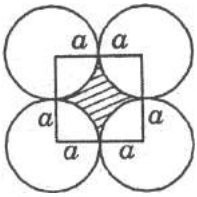
Hence (b) is the correct option.

44. L.S.A. of Triangular prism of sides 15 cm, 20 cm, 25 cm with height 40 cm is 2400 sq.cm.
Perimeter of the base of prism is 60 cm
Hence (a) is the correct option.

45. Volume of a regular hexagonal prism of side 30 cm and height 6 cm is 14029.2cc
Volume = Area of base x height
Hence (b) is the correct option.

SECTION - III
Linked Comprehension Type

46.



Area of the shaded
Portion = Area of the square
$-4\times$ Area of the Quadrant

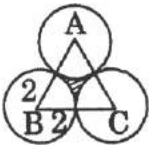
$$=(2a)^2-4\times\frac{1}{4}\times\pi\times a^2$$

$$=4a^2-\pi a^2$$

$$=\left(4-\frac{22}{7}\right)a^2=\frac{6}{7}a^2$$

Hence (a) is the correct option.

47.



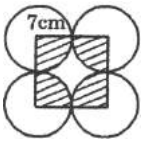
Area of the shaded portion
= Area of the equilateral triangle
$-3\times$ *area* of the Quadrant

$$=\frac{\sqrt{3}}{4}\times(2)^2-3.\frac{1}{4}\times\pi(2^2)$$

$$=\sqrt{3}-3\pi=0.642cm^2$$

Hence (b) is the correct option.

48.



Area of the shaded portion
$=4\times$ Area of the Quadrant

$$=4\times\frac{1}{4}\times\pi\times7^2$$

$$=49\pi=49\times\frac{22}{7}$$

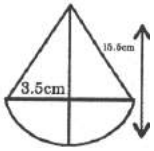
$$=7\times22=154cm^2$$

Hence (a) is the correct option.

49. Slant height of the cone = 7.5 mts
Hence (a) is the correct option.

50. Canvas required for conical portion of the tent is 106.71 m
Hence (b) is the correct option.

51.



Canvas required for the cylindrical part of the tent is $246.24cm^2$
Hence (b) is the correct option.

52. Curved surface area is $137.cm^2$
Hence (a) is the correct option.

53. Curved surface area of the hemisphere $= 77cm^2$
Hence (c) is the correct option.

54. Total surface area of the top $214.5cm^2$
Hence (c) is the correct option.

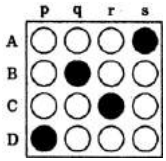
55. Slant height of the pyramid = 13 cm
Hence (a) is the correct option.

56. Lateral surface area of the pyramid is $260cm^2$
Hence (a) is the correct option.

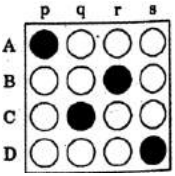
57. Volume of the pyramid is 200 c.c
Hence (b) is the correct option.

SECTION - IV
Matrix - Match Type

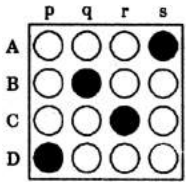
58.



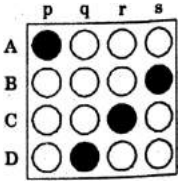
59.



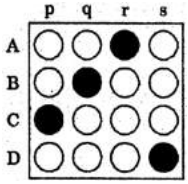
60.



61.



62.



63.