

(iv) Case ICase II

(12)

$$(CSA)_1 = 2 (CSA_2)$$

$$\Rightarrow \pi r_1 l_1 = 2 \cdot \pi r_2 l_2$$

$$\Rightarrow r_1 l_1 = 2 r_2 l_2$$

$$\Rightarrow r_1 l_1 = 2 r_2 (2l_1) \quad \text{Since } l_2 = 2l_1$$

$$\Rightarrow r_1 = 4 r_2$$

$$\Rightarrow r_1 : r_2 = 4 : 1$$

LEARNERS TASK

CUQ'S

01.	Conceptual	Ans: D
02.	Conceptual	Ans: C
03.	Conceptual	Ans: D
04.	Conceptual	Ans: B
05.	Conceptual	Ans: A
06.	Conceptual	Ans: D
07.	Conceptual	Ans: D
08.	Conceptual	Ans: D
09.	Conceptual	Ans: D
10.	Conceptual	Ans: B

JEEMAINS LEVEL

01. $d = 7 \text{ m}$, $r = \frac{7}{2} \text{ m}$

$$S.A = 4\pi r^2$$

$$= 4 \times \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} = 154 \text{ sq.m}$$

Ans: A



02

$$l:b:h = 2:3:4$$

$$\Rightarrow l = 2x, b = 3x, h = 4x$$

$$\begin{aligned} \text{C.S.A} &= 2(lb + bh + hl) \\ &= 2(2x \cdot 3x + 3x \cdot 4x + 4x \cdot 2x) \\ &= 52x^2 \text{ Sq.mt} \end{aligned}$$

$$\begin{aligned} \text{Total cost} &= \text{Area} \times \text{cost per 1 Sq.mt} \\ &= 52x^2 \times (4.50) = 52x^2 \cdot (4) \\ &= 26x^2 = 416 \end{aligned}$$

$$\Rightarrow x = 4.$$

$\therefore$ The dimensions are 8, 12, 16

Ans: C

03

$$2\pi r = 17.6$$

$$\Rightarrow 2 \times \frac{22}{7} \times r = 17.6$$

$$\Rightarrow r = 2.8 \text{ mt}$$

$$\text{C.S.A} = 2\pi r^2$$

$$= 2 \times \frac{22}{7} \times (2.8)^2$$

$$= 49.28$$

Cost of painting $\rightarrow$ per $100 \text{ cm}^2 \rightarrow \text{Rs } 5.$

$$\begin{aligned} \text{Now C.S.A} &= 49.28 \text{ mt}^2 \\ &= 49.28 \times 100 \times 100 \text{ cm}^2 \\ &= 492800 \text{ cm}^2 \end{aligned}$$

$$\text{Cost of painting} = \frac{5}{100} \times 492800$$

$$= \text{Rs } 24,640.$$

Ans: D

04

$$\text{original S.A} = 6a^2$$

$$\text{New S.A} = 6(2a)^2 = 24a^2$$

$$\% \text{ increase} = \frac{\text{New} - \text{original}}{\text{original}} \times 100$$

$$= \frac{18a^2}{6a^2} \times 100 = 300\%$$

Ans: D



05 for cone

$$r = 7, h = 24$$

$$l^2 = h^2 + r^2$$

$$= 24^2 + 7^2$$

$$l^2 = 625 \Rightarrow l = 25$$

$$C.S.A = \pi r l$$

$$= \frac{22}{7} \times 7 \times 25 = 550 \text{ m}^2$$

$$\text{Now Area} = l \times b$$
$$= l \times 5$$

$$\therefore 5l = 550$$

$$\Rightarrow l = 110 \text{ m}$$

Ans: B

06 $l = 20, b = 16, h = 12$

$$\text{length of the rod} = \sqrt{l^2 + b^2 + h^2}$$

$$= \sqrt{20^2 + 16^2 + 12^2}$$

$$= \sqrt{400 + 256 + 144}$$

$$= \sqrt{800}$$

$$= 10\sqrt{8} = 10 \times 2\sqrt{2}$$

$$= 20 \times 1.414$$

$$= 28.28$$

Ans: D

07 diagonal of floor = $\sqrt{l^2 + b^2}$

$$\therefore \sqrt{l^2 + b^2} = 10 \Rightarrow l^2 + b^2 = 100 \rightarrow \text{①}$$

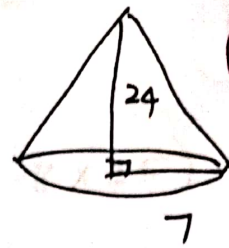
$$\text{diagonal} = \sqrt{l^2 + b^2 + h^2} = 10\sqrt{2}$$

$$\Rightarrow l^2 + b^2 + h^2 = 200$$

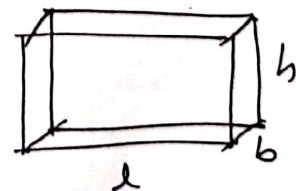
$$\Rightarrow 100 + h^2 = 200$$

$$\Rightarrow h = 10 \text{ m}$$

Ans: D



14



08 $l = 25\text{cm}, b = 15\text{cm}, h = 8\text{cm}$

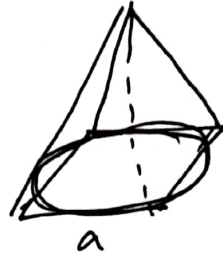
(15)

$$T.S.A = 2(lb + bh + hl)$$

$$= 2(25 \times 15 + 15 \times 8 + 8 \times 25)$$

$$= 1390\text{ cm}^2 \quad \text{Ans: C}$$

09 Let base = radius = r
height = $h = 2r$



10 $r = 14\text{cm}$

$$C.S.A = 2\pi r^2$$

$$= 2 \times \frac{22}{7} \times 14 \times 14$$

$$= 1232\text{ sq. m}$$

$$\text{Total cost} = 1232 \times 3$$

$$= \text{Rs } 3696$$

Ans: D

11. $r = 14\text{m}, d = 7\text{cm}$

$$\therefore R = r + d = 14 + 7 = 21\text{cm.}$$



$$R = r + d$$

T.S.A. of hollow hemisphere

$$= 2\pi r^2 + 2\pi R^2 + \pi R^2 - \pi r^2$$

$$= \pi r^2 + 3\pi R^2$$

$$= \frac{22}{7} \times 14^2 + 3 \times \frac{22}{7} \times (21)^2$$

$$= 4774$$

Ans: A

12.

$$l + b + h = 5\sqrt{3}$$

$$\sqrt{l^2 + b^2 + h^2} = 3\sqrt{5}$$

$$\Rightarrow l^2 + b^2 + h^2 = 45$$

$$(l + b + h)^2 - 2(lb + bh + hl) = 45$$

$$\Rightarrow lb + bh + hl = 15$$

$$\therefore T. S. A = 2(lb + bh + hl)$$

$$= 2 \times 15$$

$$= 30 \text{ sq. cm}$$

Ans A

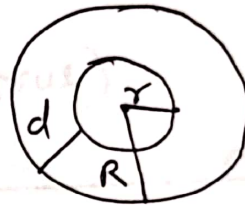
13 Statement I: $r = 15 \text{ m}$

$$d = 7 \text{ m}$$

$$\therefore R = r + d$$

$$= 15 + 7$$

$$= 22 \text{ m}$$



$$\text{Area of path} = \pi R^2 - \pi r^2$$

$$= \frac{22}{7} \times 22^2 - \frac{22}{7} \times 15^2$$

$$= \frac{22}{7} (22 + 15)(22 - 15)$$

$$= \frac{22}{7} \times 37 \times 7$$

$$= \frac{814}{1} \times 10$$

$$\text{Total cost} = \frac{814}{1} \times 10$$

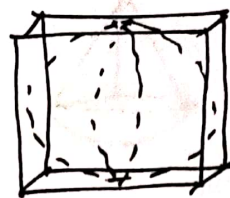
$$= \text{Rs. } 8140 \text{ (True)}$$

Statement II: Conceptual (True)

Ans A

14 Statement I:

$$r = 3.5 = \frac{7}{2} \text{ cm}$$



(17)

$$\begin{aligned} \text{C.S.A of sphere} &= 4\pi r^2 \\ &= 4 \times \frac{22}{7} \times \left(\frac{7}{2}\right)^2 \end{aligned}$$

$$\begin{aligned} \text{C.S.A of Cub} &= 6a^2 \\ &= 6 \times (7)^2 \end{aligned} \quad \begin{aligned} \text{Since } a &= 2r \\ &= 2 \times \frac{7}{2} \end{aligned}$$

$$\begin{aligned} \text{Difference in S.A} &= 6 \times 7^2 - 4 \times \frac{22}{7} \times \left(\frac{7}{2}\right)^2 = 7 \\ &= 140 \text{ cm}^2 \end{aligned}$$

Statement II: Conceptual (True)

Ans. A

15 $l = 3 \text{ mt}, b = 2 \text{ mt}, h = 1 \text{ mt}$

$$\begin{aligned} \text{T.S.A} &= 2(lb + bh + hl) \\ &= 2(3 \times 2 + 2 \times 1 + 1 \times 3) \\ &= 22 \text{ mt}^2 \end{aligned}$$

$$\begin{aligned} \text{Total cost} &= \text{Rs } 22 \times 10 \\ &= \text{Rs } 220. \end{aligned}$$

Ans. B

16 S.A. of Remaining box = T.S.A — Area of Side removed

$$= 2(lb + bh + hl) - 2 \times b$$

$$\begin{aligned} &= 2(3 \times 2 + 2 \times 1 + 2 \times 1 \times 3) - 2 \times 2 \\ &= 6 + 4 + 6 = 16 \end{aligned}$$

$$\begin{aligned} &= 22 - 2 \times 2 \\ &= 20 \end{aligned}$$

Ans. C

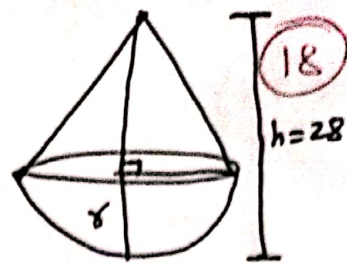


17. for cone hemisphere

$$r = 14 \text{ m}$$

for cone

$$r = 14 \text{ m}, h = 28 - 14 = 14 \text{ m}$$



$$\begin{aligned} \text{Ans. } l^2 &= h^2 + r^2 \\ &= 14^2 + 14^2 \\ &= 2 \times 14^2 \end{aligned} \quad \left| \quad \begin{aligned} \therefore l &= \sqrt{2 \times 14^2} \\ &= 14\sqrt{2} \end{aligned} \right.$$

Area of Canvas required = ~~Area~~ C.S.A.

$$\begin{aligned} \text{of cone} &= \pi r l \\ &= \frac{22}{7} \times 14 \times 14\sqrt{2} \\ &= 616\sqrt{2}. \end{aligned}$$

Ans: D

18. Area of metal sheet required

= C.S.A. of hemisphere

$$\begin{aligned} &= 2\pi r^2 \\ &= 2 \times \frac{22}{7} \times 14^2 \\ &= 1232 \end{aligned}$$

Ans: D

19. for cube

$$a = 4$$

for cuboid

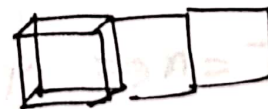
$$l = 12, b = 4, h = 4$$

$$\begin{aligned} \text{T.S.A} &= 2(lb + bh + hl) \\ &= 2(12 \times 4 + 4 \times 4 + 12 \times 4) = 224. \end{aligned}$$

$$\begin{aligned} \text{T.S.A of 3 cubes} &= 3 \times 6a^2 = 18 \times 4^2 \\ &= 288 \end{aligned}$$

$$\therefore \text{Ratio} = \frac{288}{224} = \frac{9}{7}$$

Ans: 7



$$a = 4$$



20. for cylinder

(19)

$$h = 8 \text{ cm}$$

$$C.S.A = 2\pi r h = 704$$

$$2 \times \frac{22}{7} \times r \times 8 = 704$$

$$r = 14$$

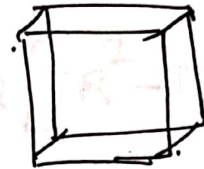
$$\text{Sum of the digits} = 1 + 4 = 5$$

Ans: 5

21

i) Let the side of cube be a

$$\text{Now, diagonal} = \sqrt{3} a$$



$$\text{Side of the square} = s = \sqrt{3} a$$

$$\begin{aligned} \text{Area} = s^2 &= (\sqrt{3} a)^2 \\ &= 3a^2 = 75 \end{aligned}$$

$$\Rightarrow a = 5$$

$$(ii) \pi r l = 154$$

$$\Rightarrow \frac{22}{7} \times r \times 7 = 154$$

$$\Rightarrow r = 11$$

$$(iii) C.S.A \text{ of cylinder} = 968$$

$$\Rightarrow 2\pi r h = 968$$

$$\Rightarrow 2 \times \frac{22}{7} \times r \times 11 = 968$$

$$\Rightarrow r = 14 \quad \therefore 2r = 28 \Rightarrow r = 14$$

$$(iv) \text{Area of 4 walls} = L.S.A = 2h(l+b) = 350$$

$$\text{New area} = 2 \times 3h[3l+3b]$$

$$= 9 \times 2h(l+b)$$

$$= 9 \times 350$$

$$= 3150$$

units are in m. Ans. 1, 14, 11, 9



$$22 \text{ (i) } 2\pi r h = 88$$

(20)

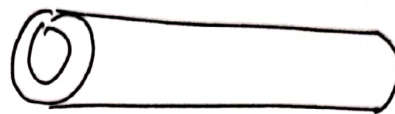
$$\Rightarrow 2 \times \frac{22}{7} \times r \times 14 = 88$$

$$\Rightarrow r = 1 \quad \therefore \text{diameter} = 2$$

$$\text{(ii) } h = 77 \text{ cm}$$

$$d = 4 \text{ cm} \quad \left| \quad D = 4.4 \text{ cm} \right.$$

$$\therefore r = 2 \text{ cm} \quad \left| \quad R = 2.2 \text{ cm} \right.$$



$$\text{Total S.A} = 2\pi R h + 2\pi r h + 2[\pi R^2 - \pi r^2]$$

$$= 2 \times \frac{22}{7} \times 2.2 \times 77 + 2 \times \frac{22}{7} \times 2 \times 77 +$$

$$2 \left[\frac{22}{7} \times (2.2)^2 - \frac{22}{7} \times (2)^2 \right]$$

$$= 2038.08 \text{ cm}^2$$

$$\text{(iii) } d = 84 \Rightarrow r = 42 \text{ cm}$$

$$h = 120 \text{ cm}$$

$$\text{C.S.A} = 2\pi r h$$

$$= 2 \times \frac{22}{7} \times 42 \times 120$$

Total area covered for 500 complete revolutions

$$= \frac{2 \times 22}{7} \times 42 \times 120 \times 500$$

$$= 15840000 \text{ sq. cm} = 1584 \text{ sq. m}$$

$$\text{(iv) } 6a^2 = \frac{50}{3}$$

$$\Rightarrow a^2 = \frac{50}{3} \times \frac{1}{6} = \frac{25}{9} \quad \therefore a = \frac{5}{3}$$

$\Rightarrow$ THE END $\Leftarrow$ Ans: t, s, r, p

