

INTEGRATED ⁺

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Class: VIII, MATHEMATICS

7. MENSURATION

TEACHING TASK (JEE MAINS)

01. T.S.A = $2(lb + bh + hl)$
 $= 2(4 \times 3 + 3 \times 12 + 12 \times 4)$
 $= 2(12 + 36 + 48) = 2 \times 96 = 192 \text{ cm}^2$ Ans: A

02. Cube: $a = 10 \text{ cm}$
L.S.A = $4a^2 = 4 \times 10^2 = 400 \text{ cm}^2$ Ans

03 cylinder: $r = 7, h = 24$
T.S.A = $2\pi r(r + h)$
 $= 2 \times \frac{22}{7} \times 7(7 + 24) = 1364 \text{ cm}^2$ Ans: _____

04. cylinder $r = 5, h = 20$
T.S.A = $2\pi r(r + h)$
 $= 2 \times \frac{22}{7} \times 5(5 + 20) =$
 $= 250\pi \text{ cm}^2$ Ans: D

05. $r = 8 \text{ cm}, l = 15 \text{ cm}$ Cone
T.S.A = $\pi r l + \pi r^2$
 $= \pi \times 8 \times 15 + \pi \cdot 8^2$
 $= 184\pi \text{ cm}^2$ Ans: A

06. cylinder: $r = 0.7 \text{ m}, h = 2 \text{ m}$.
Area covered = $5 \times 2\pi r h = 10 \times \pi \times \frac{7}{10} \times 2$
 $= 14\pi \text{ m}^2$ Ans: B

07. Cylinder: $r = 7\text{cm}$
 height $= h = 50 \times 0.5 = 25$
 $T.S.A = 2\pi r (r + h)$
 $= 2\pi \times 7 (7 + 25)$
 $=$

08 Volume cuboid $= lbh$
 $= 12.5 \times 13.5 \times 1.5$
 $=$

09 Pyramid
 $L.S.A = \frac{1}{2} \times \text{perimeter of the base} \times l$
 $\Rightarrow 260 = \frac{1}{2} \times 4 \times 10 \times l$
 $\Rightarrow l = 13$ Ans: C

10. Sphere: $r = \frac{21}{2}\text{cm}$,
 Leather required $= 5 \times \frac{4}{3} \pi r^3$
 $= 5 \times \frac{4}{3} \times \pi \times \left(\frac{21}{2}\right)^3$
Ans:

11. a) $T.S.A = L.S.A + 2 \times \text{Base area}$
 $= 60 + 2 \times 24$
 $= 108\text{cm}^2 \checkmark$
 b) volume $= \text{Area of the base} \times \text{height}$
 $= 24 \times 10 = 240\text{cm}^3 \checkmark$
 c) $L.S.A + T.S.A = 60 + 108 = 168\text{cm}^2$
 d) $T.S.A = 84\text{cm}^2$ Ans: A, B

12. Cube $a = 4$

$$\text{Base perimeter} = 4a = 4 \times 4 = 16 = \frac{32}{2}$$

Ans: B, C, D

13. Statement I: Hemisphere, $r = 7 \text{ cm}$

$$\begin{aligned} \text{T.S.A} &= 3\pi r^2 \\ &= 3 \times \frac{22}{7} \times 7^2 = 462 \text{ cm}^2 \text{ (False)} \end{aligned}$$

Statement II: Hemisphere, $r = 7 \text{ cm}$

$$\begin{aligned} \text{C.S.A} &= 2\pi r^2 \\ &= 2 \times \frac{22}{7} \times 7^2 = 308 \text{ cm}^2 \text{ (True)} \end{aligned}$$

Ans: D

14. Statement I: Conceptual (True)

Statement II: Conceptual (True)

Ans: A

15. Assertion: cylinder $r = 7 \text{ cm}$, $h = 10 \text{ cm}$

$$\begin{aligned} \text{T.S.A} &= 2\pi r (r + h) \\ &= 2 \times \frac{22}{7} \times 7 (7 + 10) = 608 \text{ cm}^2 \text{ (False)} \end{aligned}$$

Reason: cylinder $r = 7 \text{ cm}$, $h = 10 \text{ cm}$

$$\begin{aligned} \text{C.S.A} &= 2\pi rh \\ &= 2 \times \frac{22}{7} \times 7 \times 10 = 140\pi \text{ cm}^2 \text{ (True)} \end{aligned}$$

Ans: D

16. Assertion: ~~LSA~~ $= 4a^2$ (True)

Reason: ~~LSA~~ $= \text{LSA} = 2h(l + b)$ (True)

Ans: A

$$\begin{aligned} \text{T.S.A} &= \text{L.S.A} + 2 \text{ Base area} \\ &= 80 + 2 \times 30 = 140 \text{ cm}^2 \end{aligned} \quad \text{(Ans: A)}$$

$$\begin{aligned} \text{Volume} &= \text{Area of the base} \times \text{height} \\ &= 30 \times 10 = 300 \text{ cm}^3 \end{aligned}$$

Ans: A

19.	Conceptual	Ans: A ⁽⁴⁾
20.	radius	Ans: A
21.	Volume = $20 \times 8 = 160 \text{ cm}^3$	Ans: 160
22	T.S.A = $2 (15 \times 10 + 10 \times 5 + 15 \times 5)$ $= 2(275) = 550 \text{ cm}^2$	Ans: 550
23	a) Volume = $20 \times 10 = 200 \text{ cm}^3$ (P) b) T.S.A = $2\pi r(r+h)$ $= 2\pi \times 5(5+13)$ $= 90\pi \text{ cm}^2$ (9) c) C.S.A = $2\pi rh$ $= 2\pi(7)(15)$ $= 210\pi$ (7) d) T.S.A = $6a^2$ $= 6(12)^2 = 864 \text{ cm}^2$ (5)	Since $5^2 + 12^2 = 13^2$ Ans: P, 9, 7, 5

24	a) 6 (7) c) 8 (5) b) 12 (7) d) rectangle (9)	Ans: 7, 5, 9
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LEARNER'S TASK (CUES)

01. Sphere: $r = \frac{21}{2}$

Surface Area = $4\pi r^2$
 $= 4\pi \cdot \left(\frac{21}{2}\right)^2 = 441\pi \text{ cm}^2$

Ans: A

02. $d^2 = h^2 + r^2$
 $= 24^2 + 10^2$
 $= 576 + 100 = 676$ } $d = 26$ (5)

Ans: A

03. hemisphere: $r = 3.5 \text{ cm} = \frac{7}{2}$

C.S.A = $2\pi r^2$
 $= 2 \times \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} = 77 \text{ cm}^2$ Ans: B

04. Cuboid

T.S.A = $2(9 \times 4 + 4 \times 6 + 6 \times 9)$

$= 2(36 + 24 + 54) = 2 \times 114 = 228$ Ans: B

05. Cube. Side = $a = 5$

T.S.A = $6a^2 = 6 \times 5^2 = 150$

Ans: C

06. Conceptual

Ans: B

07. Conceptual

Ans: C

08. Conceptual

Ans: C

09. $2\pi r^2$

Ans: C

10. Conceptual

Ans: A

11.

JEEMAINS LEVEL

01. Cuboid

L.S.A = $2h(l+b)$

$= 2 \times 8(6+7)$

$= 208 \text{ cm}^2$

Ans: C



02 $T.S.A = L.S.A + 2 \times \text{Base area}$
 $= 64 + 2 \times 15$
 $= 94 \text{ cm}^2$

Ans B

03 Hemisphere $r = 14 \text{ cm}$,

$T.S.A = 3\pi r^2$
 $= 3 \times \frac{22}{7} \times 14 \times 14 = 1848 \text{ cm}^2$

Ans: C

04 Sphere $r = 7$.

Surface Area $= 4\pi r^2$
 $= 4 \times \frac{22}{7} \times 7 \times 7 = 616 \text{ cm}^2$

Ans: D

05 Cone

$C.S.A = \pi r l$
 $= \pi \cdot 6 \times 10$
 $= 60\pi$

Ans: A

06 Rectangle

Ans: A

07 Hemisphere $r = 10 \text{ cm}$

$T.S.A = 3\pi r^2$
 $= 3 \times \frac{22}{7} \times 10 \times 10 = 942.85$

Ans: B

08 Cuboid $l = 60, b = 40, h = 30$

$T.S.A = 2(2400 + 1200 + 1800)$
 $= 10800 \text{ cm}^2$

Total cost $= \frac{10800}{20} \times 5 = 27000 \text{ paise}$
 $= \text{Rs } 270.$

Ans: C

09. Cone

$$T.S.A = \pi r (r + l) = 113\frac{1}{7} = \frac{792}{7}$$

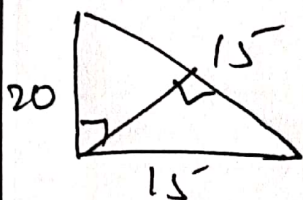
$$\Rightarrow \frac{22}{7} \times r (r + \sqrt{r^2 + h^2}) = \frac{792}{7}$$

$$\Rightarrow \frac{22}{7} \times r (r + \sqrt{r^2 + 3^2}) = \frac{792}{7}$$

$$\Rightarrow r = 4 \quad \therefore d = 8$$

(7)

10.



When revolved, the altitude to the hypotenuse forms a common radius (r) of the two cones.

The area of the triangle can be expressed

$$\text{as } \frac{1}{2} ab = \frac{1}{2} \times h \times r \Rightarrow r = \frac{ab}{h} = \frac{15 \times 20}{25} = 12 \text{ cm}$$

$$\therefore SA = \pi r l_1 + \pi r l_2$$

$$= \pi r (l_1 + l_2)$$

$$= \pi \times 12 (15 + 20) = 1320 \text{ cm}^2 \quad \text{Ans: C}$$

11.

Cone

$$r = 5, \quad l = 12$$

$$\therefore l^2 = r^2 + h^2 \Rightarrow h = \sqrt{119}$$

A) C.S.A = $\pi r l = \pi \times 5 \times 12 = 60\pi$ ✓

B) T.S.A = C.S.A + Base area

$$= \pi r (r + l)$$

$$= \pi \left(\frac{5}{1}\right) (12 + 5) = 85\pi$$
 ✓

Ans: A, B

12. Cube

$$L.S.A = 4a^2, \quad T.S.A = 6a^2$$

$$= \frac{3}{2} (4a^2)$$

$$= \frac{3}{2} \times L.S.A$$

$$\therefore \frac{T.S.A}{L.S.A} = 1.5 \times L.S.A \quad (OR)$$

$$\frac{L.S.A}{T.S.A} = \frac{2}{3} = \frac{4}{6}$$

Ans: A, B, C

13 Statement I: cylinder: $r = 7, h = 10$

$$T.S.A = 2\pi r(r+h)$$

$$= 2 \times \frac{22}{7} \times 7(7+10) = 748 \quad (False)$$

Statement II: C.S.A = $2\pi rh$

$$= 2 \times \pi \times 7 \times 10$$

$$= 140\pi \text{ cm}^2 \quad (True) \quad \text{Ans D}$$

14 Statement I: Conceptual (False)

Statement II: Conceptual (True)

Ans: D

15 Assertion: Hemisphere: $r = 7 \text{ cm}$.

$$T.S.A = 3\pi r^2 = 3 \times \frac{22}{7} \times 7 \times 7 = 462 \text{ cm}^2 \quad (False)$$

Reason: C.S.A = ~~$2\pi r^2$~~ $2\pi rh$

$$= 2 \times \frac{22}{7} \times 7 \times 7 = 268 \text{ cm}^2 \quad (False)$$

Ans: D



16. Assertion: Conceptual (True)

(9)

Reason: Conceptual (True)

Ans.. A

17. Cuboid: $l=8, b=5, h=3$

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

$$= 2(40 + 15 + 24) = 158 \text{ cm}^2$$

Ans: F

18. ~~L.S.A~~ $A = 2h(l+b)$

$$= 2 \times 3(8+5)$$

$$= 78 \text{ cm}^2$$

Ans.. A

19. Conceptual

Ans: C

20. Conceptual

Ans.. D

21. Cube: $a=8$

$$L.S.A = 4a^2 = 4 \times 8^2 = 64$$

Ans: 64

22. Sphere: $r=7 \text{ cm}$

$$T.S.A = 4\pi r^2 = 4 \times \frac{22}{7} \times 7 \times 7 = 616$$

Ans: 616

24. a) Conceptual (S) | c) Conceptual (P)

b) Conceptual (S) | d) Conceptual (P)

Ans.. S, S, P, P

25. a) $L.S.A = 2h(l+b) = 2 \times 3(8+5) = 78$ (P)

b) $T.S.A = 6a^2 = 6 \times 5^2 = 150 \text{ cm}^2$ (P)

c) $V = \frac{1}{3} \pi r^2 h = \frac{1}{3} \times \frac{22}{7} \times 3 \times 3 \times 4 = 12\pi$ (S)

d) $C.S.A = 2\pi rh = 2 \times \pi \times 5 \times 12 = 120\pi$ (S)

Ans: P, P, S, S

⇒ THE END €