[A] :- 3D FIGURES

1:(a) Curved Surface Area of the Roller is :- $2\pi rh$

$= \left(2\times\frac{22}{\cancel{7}}\times\cancel{42}^{\,6}\times150\right)\text{cm}^2 = \left(\frac{2\times22\times6\times150}{10^4}\right)$

$\therefore$ Area of the Road is :- $\left(\frac{600\times2\times22\times6\times150}{10^4}\right)\text{m}^2$

$= \boxed{2376\,\text{m}^2}$

2: (c) We know that; if the triangles are Similar; then Ratio of their areas is equal with ratio of their square of the sides.

Let; Side of the Smaller triangle is a cm.

Then the side of the bigger triangle is 2a cm.

$\therefore$ Required answer is :- $\boxed{1:4}$

3. (d) $2\pi r_1(h_1+r_1) : 2\pi r_2(h_2+r_2)$

Now, $\cancel{2}(2+2) : 1(1+\cancel{1}) = \boxed{4:1}$

4 (b) Let $l = 5x$; $h = 4x$; then area is $lh = 500$

$\therefore$ According to the question:- $20x^2 = 500 \Rightarrow x = 5$

$\therefore l+h = (5x+4x) = 9x = (9\times5) = \boxed{45\,\text{m}}$

5: (a) $r = 20$ cm, $h = 21$ cm; $l = \sqrt{(20)^2+(21)^2} = 29$ cm

$\therefore$ Total surface area: $\pi rl + \pi r^2 = \pi r(l+r)$

$= \frac{22}{7}\times20\times(20+29)$

$= \frac{22}{\cancel{7}}\times20\times\cancel{49}^{\,7} = \boxed{3080\,\text{cm}^2}$

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6. (C) Let the [redacted] height of the Wall is $2x$ m.

$\therefore$ Length is $3x$. | Then, According to the question:-

$\therefore$ Area $= 6x^2$ | $6x^2 = 600 \Rightarrow x^2 = 100 \Rightarrow x = 10$

$\therefore$ Sum of length and height is $\rightarrow (3x + 2x) = 5x = \boxed{50m}$

7. (b) Volume of the block $= (22 \times 14 \times 7)$ c.c

Volume of the cylinder $= \left(\frac{22}{7} \times 7 \times 7 \times h\right)$ c.c

$\therefore \frac{\cancel{22}}{\cancel{7}} \times \cancel{7} \times \cancel{7} \times h = \cancel{22} \times 14 \times \cancel{7} \Rightarrow \boxed{h = 14cm}$

8. (C) $\frac{V_1}{V_2} = \frac{\pi r^2 h_1}{\pi (2r)^2 \cdot h_2}$ $\left[\because h = h_2 = h\right]$

$\Rightarrow \frac{V_1}{V_2} = \frac{\pi r^2 \cdot h}{4 \pi r^2 h} = \boxed{1:4}$

9. (b) Base of the Cone $(r) = \left(\frac{10}{2}\right) = 5cm$

Height of the Cone $(h) = \sqrt{(13)^2 - (5)^2} = 12$ cm

Volume of the Cone $= \frac{1}{3}\pi r^2 h = \left(\frac{1}{\cancel{3}} \times \frac{22}{7} \times 5 \times 5 \times \cancel{12}^{4}\right)$ c.c

$= \boxed{314.2 \text{ sqcm}}$

10. (d) Let the rise in Water level be h cm.

$\therefore$ According to the question:→

$(80 \times \cancel{30} \times h) = (\cancel{120}^{4} \times 5) \Rightarrow h = \boxed{\frac{1}{4} cm}$

11. (C) Volume of the ball = Volume of the Cylinder (Raised water)

$\Rightarrow \frac{\cancel{4}^{2}}{3}\cancel{\pi} r^3 = \cancel{\pi} \times \cancel{10}^{5} \times \cancel{10}^{5} \times 5 \Rightarrow r^3 = 125 \times 3$

$\Rightarrow r =$ [redacted] $=$ [redacted] $\left[\because \sqrt[3]{3} = 1.44\right]$

$= 7.2 \approx 7cm$

$\therefore D = 2r = \boxed{14 \text{ Cm}}$

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12. (C) Area to be plastered $= [\{2(l+b)\times h\} + (l\times b)]$

$= [\{2(25+12)\times 6\} + (25\times 12)]\ m^2$

$= 744\ m^2$

$\therefore$ Cost of Plastering $= (744\times 25)/100 = \boxed{₹\ 186}$

13. (a) Let the height of the jar be $100x$ (Initially)

Now; the present height be $64x$.

$\therefore$ Original Volume $(V_1) = \pi r_1^2 \times 100x$

Present " $(V_2) = \pi r_2^2 \times 64x$

$\therefore$ ~~$\frac{V_2}{V_1} = \frac{64 r_2^2}{100 r_1^2} = \frac{16}{25}\frac{r_2^2}{r_1^2}$~~

$\Rightarrow$ ~~$\frac{V_2}{V_1}$~~ $\quad V_1 = V_2$

$\Rightarrow \cancel{\pi} r_1^2 \times 100\cancel{x} = \cancel{\pi} r_2^2 \times 64\cancel{x}$

$\Rightarrow \frac{r_1^2}{r_2^2} = \frac{64}{100} \Rightarrow \frac{r_1}{r_2} = \frac{8}{10} = \frac{4}{5}$

$\therefore$ Required answer is: $\left[\frac{(5-4)}{4}\times 100\right]\% = \boxed{25\%}$

14. (b) $\frac{2\cancel{\pi} rh}{2\cancel{\pi} r(r+h)} = \frac{4}{5}$

$\Rightarrow \frac{r+h}{h} = \frac{5}{4}$

$\Rightarrow \frac{r}{h} + 1 = \frac{5}{4}$

$\Rightarrow \frac{r}{h} = \frac{1}{4}$

$\Rightarrow r : h = 1:4$

Curved Surface Area:

$2\pi rh = 1232$

$\Rightarrow \cancel{2}\times\frac{22}{7}\times 4x^2 = \cancel{1232}\ 7$

$\Rightarrow x = 7$

$\therefore r = 7$.

then $h = 4x = \boxed{28\text{cm}}$

15. (d) Volume of the Cone :- $\left(\frac{1}{3}\pi r^2 \times \frac{r}{4}\right) = \frac{\pi r^3}{12}$

Volume of the hemi-sphere :- $\frac{2}{3}\pi R^3$

According to the question :→ $\frac{\pi r^3}{2\times 6 \cdot 2} = \frac{2}{3}\pi R^3 \Rightarrow \frac{R^3}{r^3} = \frac{1}{8}$

$\therefore R : r = \boxed{1:2}$

16. (b) Let the number of spherical balls be x.

$\left(\pi \times 7 \times 7 \times \cancel{8}^{2}\right) = x \times \frac{4}{3}\pi \times 1^3 \Rightarrow x = \boxed{294}$

17. (d) Wire will be taken as Cylinder :-

$\therefore R = \frac{r}{3}$

$\therefore \Rightarrow \pi r^2 h = \pi R^2 H$ | $\Rightarrow r^2 h = R^2 H$ → $\Rightarrow r^2 h = \left(\frac{r}{3}\right)^2 H$ | → $\Rightarrow r^2 h = \frac{r^2}{9} H$ → $\Rightarrow H = 9h$

$\therefore$ Required answer is $\boxed{9 \text{ times.}}$

18. (b) Area of first room: $2(l+b)\times h$

After all dimensions doubled ; new area :→ $2(2l+2b)\times 2h$

$= 4\left[2(l+b)\times h\right]$ = 4 times of previous area

So, Cost of painting $= (4 \times 475) = \boxed{₹ 1900}$

19. (d) Volume of each of the ball $= \frac{4}{3}\times \pi \times (20)^3 \times \frac{1}{8}$

According to the question:

$\frac{4}{3}\pi r^3 = \frac{4}{3}\pi \times (20)^3 \times \frac{1}{8} \Rightarrow \boxed{r = 10}$

20. (c) Surface area of the cube $= 6a^2$

A increase by 50% ; So the area increases by :→

$\left(50 + 50 + \frac{50 \times 50}{100}\right) = \boxed{125\%}$

21. (c) $r = 70$ cm

∴ According to the question: → $\frac{22}{7} \times 70 \times l = 40040$

$\Rightarrow l = 182$ cm

∴ $h = \sqrt{(182)^2 - (70)^2} = 168$ cm

∴ Volume $= \left(\frac{1}{\cancel{3}} \times \frac{22}{\cancel{7}} \times 70 \times 70 \times \cancel{168}^{8}\right)$ c.c $= \boxed{862400}$

22. (d) Volume of each of the ball $= \left[\frac{4}{3}\pi \times (10)^3 \times \frac{1}{8}\right]$

∴ $\frac{4}{\cancel{3}}\cancel{\pi} r^3 = \frac{4}{\cancel{3}}\cancel{\pi} \times (10)^3 \times \frac{1}{8}$ $\Rightarrow \boxed{r = 5 \text{ cm}}$

23. (c) Let the radious $= 5x$ and height $= 12x$.

The slant height $(l) = \sqrt{(5x)^2 + (12x)^2} = 13x$

∴ Required Ratio: $2\pi r(h + r) : \pi r(l + r)$

$= 2 \cdot 17x : 18x = \boxed{17 : 9}$

24. (b) Let the radious of the rod $= r$; then height $= 8r$

∴ Radious of 1 spherical ball $= \frac{r}{2}$

∴ According to the question:

Number of balls → $\frac{\pi r^2 \cdot 8r}{\frac{4}{3}\pi\left(\frac{r}{2}\right)^3} = \boxed{48}$

25. (c) Diagonal $= 36\sqrt{3}$

∴ Let the side be x cm.

Then; $\cancel{\sqrt{3}}x = 36\cancel{\sqrt{3}}$

$\Rightarrow x = 36$

∴ Volume $= (36)^3 = \boxed{46656 \text{ cm}^3}$