$\Rightarrow \quad \frac{4}{3}\pi R^3 = \frac{1}{3}\pi r^2 h$

$\Rightarrow \quad \frac{4}{3} \times \left(\frac{22}{7}\right) \times (6.3)^3 = \frac{1}{3} \times \left(\frac{22}{7}\right) \times (r)^2 \times 25.2$

$\Rightarrow \quad r^2 = \frac{4 \times 6.3 \times 6.3 \times 6.3}{25.2} = 6.3 \times 6.3 = (6.3)^2$

$r = 6.3$ cm

Answer 67(c).

radius of big ball (R) $= 3$ cm

radius of first ball (r_1) $= 1.5$ cm

radius of second ball (r_2) $= 2$ cm

let radius of third ball is r_3 cm

Volume of Big Ball = Volume of first ball + Volume of Second ball + Volume of third ball

$\frac{4}{3}\pi R^3 = \frac{4}{3}\pi r_1^3 + \frac{4}{3}\pi r_2^3 + \frac{4}{3}\pi r_3^3$

$\frac{4}{3}\pi R^3 = \frac{4}{3}\pi(r_1^3 + r_2^3 + r_3^3)$

$R^3 = (r_1^3 + r_2^3 + r_3^3)$

$3^3 = \{(1.5)^3 + (2)^3 + r_3^3\}$

$27 = 3.375 + 8 + r_3^3$

$r_3^3 = 27 - 11.375$

$r_3^3 = 15.625$

$r_3 = \sqrt[3]{15.625} = 2.5$ cm

radius of third ball = 2.5 cm

Answer 68(a).

initial radius (r) = 6 cm

final radius (R) = 12 cm

$$\text{ratio of surface area} = \frac{(3\pi r^2)}{(3\pi R^2)} = \frac{(r^2)}{(R^2)}$$

$$= \frac{(6^2)}{(12^2)}$$

$$= \frac{(1)}{(2\times 2)}$$

$$= \frac{(1)}{(4)}$$

Answer 69(d) .

let the radii be r and R of sphere.

r + R = 7 cm.

$\Rightarrow$ r = (7 – R) cm ..... eq(i)

Ratio of Volume of sphere = 64 : 27

$\Rightarrow \frac{\frac{4}{3}\pi R^3}{\frac{4}{3}\pi r^3} = \frac{64}{27}$

$\Rightarrow \frac{R^3}{(7-R)^3} = \frac{64}{27}$ from eq(i)

$\Rightarrow \frac{R^3}{(7-R)^3} = \left(\frac{4}{3}\right)^3$

$\Rightarrow \frac{R}{(7-R)} = \left(\frac{4}{3}\right)$

$\Rightarrow$ R = 4 cm

$\Rightarrow$ r = (7 – R) cm = (7 – 4) cm = 3 cm

Difference of surface area $= 4\pi R^2 - 4\pi r^2$

$= 4\pi(4)^2 - 4\pi(3)^2$

$= 4\pi(7)$

$= 4 \times \left(\frac{22}{7}\right) \times (7)$

$= 88\ cm^2$

Answer 70(c) .

Given:

Radius of hemispherical bowl (R) $= 9$ cm

$\Rightarrow$ diameter of bottle $= 3$ cm

radius of bottle (r) $= 1.5$ cm

$\Rightarrow$ Height of bottle (h) $= 4$ cm

No. Of bottles $= \frac{Volume of bowl}{Volume of one bottle}$

$= \frac{\left(\frac{2}{3}\right)\times\pi\times(9)^3}{\pi\times(1.5)^2\times4}$

$= \left(\frac{2\times3\times81}{9}\right)$

$= 54$

Answer 71(b).

let the height of cone be h.

And radius of cone be r .

height of hemisphere = radius of hemisphere = r

Volume of cone = Volume of hemisphere

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

$\Rightarrow \quad h = 2r$

$\frac{h}{r} = \frac{2}{1}$

hence ratio of height = 2:1

Answer 72(a).

let the radius of each base is r cm.

height of hemisphere = radius of hemisphere = r cm

so, height of each is r cm.

Volume of Cone : Volume of hemisphere : Volume of cynlinder

$\Rightarrow \frac{1}{3}\pi r^2(r) : \frac{2}{3}\pi r^3 : \pi r^2(r)$

$\Rightarrow \quad \frac{1}{3} : \frac{2}{3} : 1$

$\Rightarrow \quad 1 : 2 : 3$

Answer 73(c).

let the radius of sphere be R

Volume of Sphere = Surface area of sphere (given)

$\Rightarrow \frac{4}{3}\pi R^3 = 4\pi R^2$

$\Rightarrow \quad R = 3$ unit.