

Surface Areas and Volumes Ex.16.2 Q22

Answer:

We have to find the remaining volume of the cylinder when the toy is inserted into it. The toy is a hemisphere surmounted by a cone.

Radius of cone, cylinder and hemisphere (r) = 2 cm

Height of cone (1) = 2 cm

Height of the cylinder (h) = 4 cm

So the remaining volume of the cylinder when the toy is inserted into it,

$$= \pi r^2 h - \left(\frac{1}{3}\pi r^2 l + \frac{2}{3}\pi r^3\right)$$

Put the values to get,

$$=16\pi - \left(\frac{8\pi}{3} + \frac{16\pi}{3}\right)$$

$$=16\pi-8\pi$$

$$=8\pi$$

Surface Areas and Volumes Ex.16.2 Q23

Answer:

We have to find the remaining volume of water left in the cylinder when the solid is inserted into it. The solid is a hemisphere surmounted by a cone.

Radius of cone, cylinder and hemisphere (r) = 60 cm

Height of cone (I) = 120 cm

Height of the cylinder (h) = 180 cm

So the remaining volume of water left in the cylinder when the solid is inserted into it,

$$= \pi r^2 h - \left(\frac{1}{3}\pi r^2 l + \frac{2}{3}\pi r^3\right)$$

$$=\pi r^2 \left(h - \frac{1}{3}I - \frac{2}{3}r\right)$$

Put the values to get,

$$= \left(\frac{22}{7}\right) (3600) (180 - 40 - 40) \text{ m}^3$$

$$= 1.131 \text{ m}^3$$

Surface Areas and Volumes Ex.16.2 Q24

Answer:

We have a cylindrical vessel in which a cone is inserted. We have,

Radius of the cylinder $(r_1) = 5$ cm

Radius of cone $(r_2) = 3.5$ cm

Height of cylinder (h) = 10.5 cm

Height of cone (l) = 6 cm

(i) We have to find the volume of water displaced from the cylinder when cone is inserted. So,

Volume of water displaced = Volume of cone

So volume of water displaced,

$$= \frac{1}{3}\pi r_2^2 l$$

$$= \frac{1}{3} \left(\frac{22}{7}\right) (12.25)(6) \text{ cm}^3$$

$$= \boxed{77 \text{ cm}^3}$$

(ii) We have to find the volume of water remaining in the cylinder.

Volume of water left = Volume of cylinder - Volume of cone

So volume of the water left in the cylinder,

$$= \left[\left(\frac{22}{7} (25)(10.5) \right) - (77) \right] \text{ cm}^3$$
$$= (825 - 77) \text{ cm}^3$$

$$= 748 \text{ cm}^3$$

Surface Areas and Volumes Ex.16.2 Q25

Answer:

We have to find the remaining volume and surface area of a cubical box when a hemisphere is cut out from it.

Edge length of cube (a) = 21 cm

Radius of hemisphere (r) = 10.5 cm

Therefore volume of the remaining block,

= Volume of box - Volume of hemisphere

So

$$= (a)^3 - \frac{2}{3}\pi r^3$$

$$= (21)^3 - \frac{2}{3} \left(\frac{22}{7}\right) \left(\frac{21}{2}\right)^3$$

$$= (9261 - 2425.5) \text{ cm}^3$$

$$= [6835.5 \text{ cm}^3]$$

So, remaining surface area of the box,

- = Surface area of box Area of base of hemisphere
- + Curved surface area of hemsphere

