Value Based Questions

Que 1. A manufacture involved ten children in colouring playing top (lattu) which is shaped like a cone surmounted by a hemisphere. The entire top is 5 cm in height and the diameter of the top is 3.5 cm. Find the area they had to paint if 50 playing tops were given to them. $\left(\boldsymbol{Take}\ \boldsymbol{\pi} = \frac{22}{7}\right)$

(a) How is child labour an abuse for the society?

(b) What steps can be taken to abolish child labour?

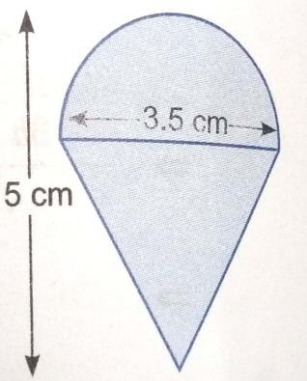

Fig. 9

Sol. This top is exactly like the object in Fig. 9.

∴ Total surface area of the top = Curved surface area of hemisphere + Curved surface area of cone

Now, the curved surface area of hemisphere = $2\pi r^2$

$$= \left(2 \times \frac{22}{7} \times \frac{3.5}{2} \times \frac{3.5}{2}\right)\ cm^2$$

Also, the height of the cone

= Height of the top – Height (radius) of the hemisphere part

$$= \left(5 - \frac{3.5}{2}\right)\ cm = 3.25\ cm$$

So, the slant height of the cone (l) = $\sqrt{r^2 + h^2}$

$$= \sqrt{\left(\frac{3.5}{2}\right)^2 + (3.25)^2} cm = \ 3.7\ cm\ (approx)$$

Therefore, curved surface area of cone $\pi rl\ = \left(\frac{22}{7} \times \frac{3.5}{2} \times 3.7\right) \text{cm}^2$

Thus, the surface area of the top = $\left(2 \times \frac{22}{7} \times \frac{3.5}{2} \times \frac{3.5}{2}\right)\ cm^2\ +\ \left(\frac{22}{7} \times \frac{3.5}{2} \times 3.7\right)\ cm^2$

$$= \frac{22}{7} \times \frac{3.5}{2}(3.5 + 3.7)\ cm^2 = \frac{22}{7} \times \frac{3.5}{2} \times 7.2\ cm^2$$

$= 39.6\ \text{cm}^2$ (approx.)

Surface area to be painted = 50 × 39.6 cm^2 = 1980 cm^2

(a) Children are the future of any society or country and they possess various talents. So, providing them opportunities to grow be giving proper education instead of involving them in work will help in the development of society. With education and proper nurture of their talent, they can contribute in a better way for the development of society and the country.

(b) (i) Spreading awareness against child labour in the society.
(ii) Abolishing the use of products involving child labour.
(iii) Providing free education at elementary level to poor children.
(iv) Enforcing the law to abolish child labour.

Que 2. A child prepares a poster on 'Save Energy' on a square sheet whose each side measures 60 cm. At each corner of the sheet, she draws a quadrant of radius 17.5 cm in which she shows the ways to save energy. At the centre, she draws a circle of diameter 21 cm and writes a slogan in it. Find the area of the remaining sheet.
(a) Write down the four ways by which energy can be saved.
(b) Write a slogan on 'Save Energy'.
(c) Why do we need to save energy?

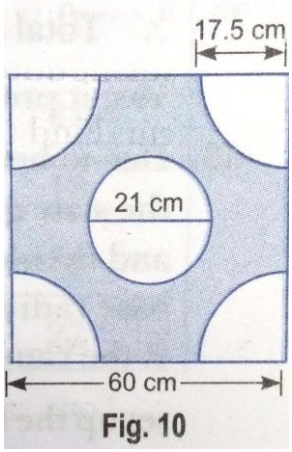

Fig. 10

Sol. Area of the square = 60 x 60 = 3600 cm^2

Area of the remaining sheet = $3600 - \pi\left(\frac{21}{2}\right)^2 - 4 \times \frac{\pi}{4} \times (17.5)^2$

$= 3600 - \pi\left(\frac{441}{4} + \frac{1225}{4}\right)$

$= 3600 - \frac{22}{7} \times \frac{1666}{4} = 3600 - 1309 = 2291\ cm^2$

(a) (i) Saving electricity by using CFLs, switching off appliances when not in use.
(ii) Saving water by using it efficiently.
(iii) Saving petroleum resources by using public transport.
(iv) Using solar energy.

(b) 'Save energy, Save Environment' or any other given by students.
(c) We should save energy to save our environment so that we can give a better tomorrow to the forth coming generations.

Que 3. A teacher brings clay in the classroom to teach the topic' mensuration'. She forms a cylinder of radius 6 cm and height 8 cm with the clay. Then she moulds that cylinder into a sphere. Find the radius of the sphere formed.
Do teaching aids enhance teaching learning process? Justify your answer.

Sol. Volume of the cylinder formed = Volume of the sphere

$\Rightarrow \quad \pi(6)^2 \times 8 = \frac{4}{3}\pi r^3 \quad \Rightarrow \quad \frac{6^2 \times 8 \times 3}{4} = r^3$

$\Rightarrow \quad r^3 = 6^3 \quad$ or $\quad r = 6$ cm

Yes, teaching aids make the learning practical, interesting, easy to learn and leave long lasting impact.

Que 4. A night camp was organised for Class X students for two days and their accommodation was planned in tents. Each tent is in the shape of a cylinder surmounted by a conical top. If the height and diameter of the cylindrical part are 2.1 m and 4 m respectively and the slant height of the top is 2.8 m, find the area of the canvas used for making the tent. Also, find the cost of the canvas of the tent at the rate of ₹ 500 per m^2. (Note that the base of the tent will not be covered with canvas). Is camping helpful to students in their development? Justify your answer.

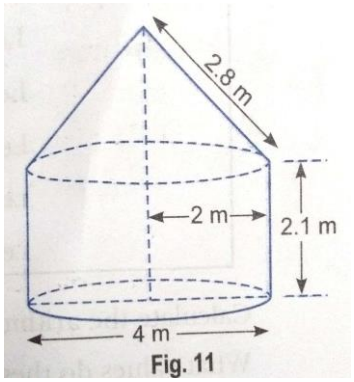

Fig. 11

Sol. We have, Radius of cylindrical base = $\frac{4}{2} = 2\ m$

Height of cylindrical portion = 2.1 m

∴ Curved surface area of cylindrical portion = 2 πrh

$= 2 \times \frac{22}{7} \times 2 \times 2.1$

$= 26.4\ m^2$

Radius of conical base (r) = 2 m

Slant height of conical portion (l) = 2.8 m

∴ Curved surface area of conical = πrl

$= \frac{22}{7} \times 2 \times 2.8$

$= 17.6\ m^2$

Now, total area of the canvas = (26.4 + 17.6) m^2 = 44 m^2

∴ Total cost of the canvas used = ₹ 500 × 44 = ₹ 22,000

Yes, it provides the feeling of self-confidence, sharing, caring and other social values.

Que 5. Due to heavy floods in a state, thousands were rendered homeless. 50 schools collectively offered to the state government to provide place and the canvas for 1500 tents to be fixed by the government and decided to share the whole expenditure equally. The lower part of each tent is cylindrical of base radius 2.8 m and height 3.5 m, with conical upper part of same base radius but of height 2.1 m. If the canvas used to make the tents costs ₹ 120 per sq. m, find the amount shared by each school to set up the tents. What value is generated by the above problem? $\left(\boldsymbol{Use\ \pi = \frac{22}{7}}\right)$

Sol. Slant height of conical part = $\sqrt{(2.8)^2 + (2.1)^2} = 3.5\ m$

Area of canvas/tent = $2\pi rh + \pi rl$

$$= 2 \times \frac{22}{7} \times 2.8 \times 3.5 + \frac{22}{7} \times 2.8 \times 3.5\ m^2$$

$$= \frac{22}{7} \times 2.8 \times 3.5(2 + 1)$$

$$= 3 \times \frac{22}{7} \times 2.8 \times 3.5$$

$$= 92.4\ m^2$$

Cost of 1500 tents = $1500 \times 92.5 \times 120$ = ₹ 1,66,32,000

Share of each school = $\frac{1}{50} \times 16632000 =$ ₹ 3,32,640

Values: Helping the needy people