



IX/ VOLUME & SURFACE AREA/ CASE STUDY

During vacation, two friends decided to visit Shimla. Due to peak days in Shimla, they did not get any room to stay in. So, they thought to buy a tent and set up in a park. They made a tent in the shape of a cone, whose diameter is 14 cm and height is 22 cm.



On the basis of the above information, solve the following questions:

Q1. How much volume of air is stored in a conical tent?

- a. 1140 cm^3
- b. 1132 cm^3
- c. 1129.33 cm^3
- d. 1134 cm^3

Q2. The slant height of a cone is:

- a. $\sqrt{521} \text{ cm}$
- b. $\sqrt{533} \text{ cm}$
- c. $2\sqrt{533} \text{ cm}$
- d. $\sqrt{537} \text{ cm}$

Q3. The base area covered by a conical tent is:

- a. 150 cm^2
- b. 153 cm^2
- c. 154 cm^2
- d. 159 cm^2

Q4. The curved surface area of a conical tent is:

(Use $\sqrt{533} = 23.09$)

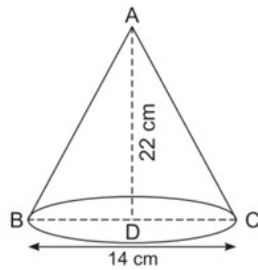
- a. 508 cm^2
- b. 507.98 cm^2
- c. 509 cm^2
- d. 512 cm^2

Q5. If the cost of painting a tent is 50 paise per cm^2 , then the cost of painting the tent is (approximate):

- a. 260
- b. 255
- c. 254
- d. 270

Solutions

1. (c) Given, diameter of cone, $d = 14$ cm and height of cone, $h = 22$ cm



Therefore, radius of a cone, $r = \frac{d}{2} = \frac{14}{2} = 7$ cm

$\therefore$ Volume of air stored in a conical tent
= Volume of cone

$$\begin{aligned} &= \frac{1}{3} \pi r^2 h = \frac{1}{3} \times \frac{22}{7} \times (7)^2 \times 22 \text{ cm}^3 \\ &= 1129.33 \text{ cm}^3 \end{aligned}$$

So, option (c) is correct.

2. (b)

$$\begin{aligned} \therefore \text{The slant height of a cone} &= \sqrt{(7)^2 + (22)^2} \\ &= \sqrt{49 + 484} = \sqrt{533} \text{ cm} \end{aligned}$$

So, option (b) is correct.

3. (c) The base area covered by a conical tent is

$$\begin{aligned} A &= \text{Area of circle} = \pi r^2 \\ &= \frac{22}{7} \times (7)^2 = 22 \times 7 = 154 \text{ cm}^2 \end{aligned}$$

So, option (c) is correct.

4. (b) The curved surface area of a conical tent $= \pi r l$

$$\begin{aligned} &= \frac{22}{7} \times 7 \times \sqrt{533} \quad [\because l = \sqrt{533} \text{ cm}] \\ &= 22 \times 23.09 = 507.98 \text{ cm}^2 \end{aligned}$$

So, option (b) is correct.

5. (c) Given, 1 cm^2 is painted for 50 paise or ₹ 0.5.

$$\begin{aligned} \therefore 507.98 \text{ cm}^2 &\text{ is painted for ₹ } 507.98 \times 0.5 \\ &= ₹ 253.99 \approx ₹ 254 \end{aligned}$$

So, option (c) is correct.