CHAPTERS- SURFACE AREA AND VOLUMES

CLASS-IX (MATHS)

CASE STUDY:
.Read the passage given below and answer the following questions:
Once four friends Rahul, Ajay and Vijay went for a picnic at a hill station. Due to peak season they did not get a proper hotel in the city. The weather was fine so they decided to make a conical tent at a park. They were carrying 300 m² cloth with them. As shown in the figure they made the tent with height 24 m and diameter 14 m. The remaining cloth was used for the floor.(Take π = 22/7)
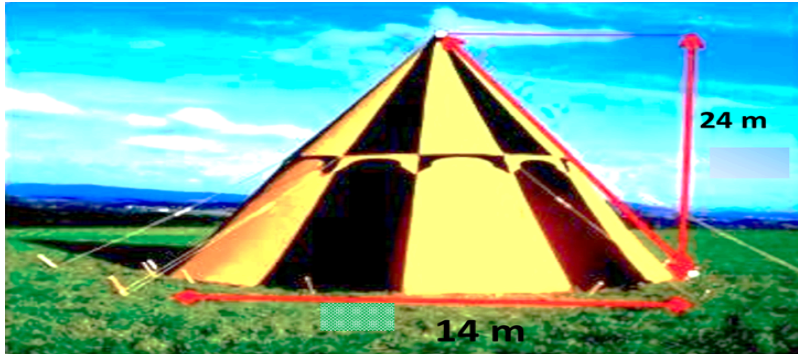
1. What was the slant height of the tent?
    (A) 25 m
    (B) 35 m
    (C) 15 m
    (D) none of these.
ANS: (A) 25 m
$l^2 = r^2 + h^2 \Rightarrow l^2 = 7^2 + 24^2 = 49 + 576 \Rightarrow l^2 = 625 \Rightarrow l = 25$ m

2.What was the Curved surface area of the tent ?
    (A) 550 m²
    (B) 704 m²
    (C) 700 m²
    (D) none of these.
ANS: (A) 550 m²
Curved surface area of the tent = $\pi r l$ = 22/7 × 7 × 25 = 550 m²

3. What was the total surface area of cone?

    (A) 550 m²
    (B) 704 m²
    (C) 700 m²
    (D) none of these.
  ANS: (B) 704 m²
Total surface area of cone = $\pi r(l + r)$ = 22/7 ×7 ×(25+ 7) = 22 × 32= 704 m²
4.What was the area of the floor of the tent?

(A) 154 m²
(B) 100m²
(C) 462m²
(D) none of these.
    Area of the floor of the tent= πr^2 =   22/7 × 7 × 7   = (A) 154 m²

5. Volume of a cone of height h and radius r is
   (A) $\pi r^2 h$
    (B) $2\pi rh$
    (C) $\frac{1}{3}\pi r^2 h$
    (D) $3\pi r^2 h$

ANS: (C) $\frac{1}{3}\pi r^2 h$

Volume of a cone of height h and radius r = $\frac{1}{3}\pi r^2 h$

CASE STUDY:

Mathematics teacher of a school took her 9th standard students to show Red fort. It was a part of their Educational trip. The teacher had interest in history as well. She narrated the facts of Red fort to students. Then the teacher said in this monument one can find combination of solid figures. There are 2 pillars which are cylindrical in shape. Also 2 domes at the corners which are hemispherical.7 smaller domes at the centre. Flag hoisting ceremony on Independence Day takes place near these domes
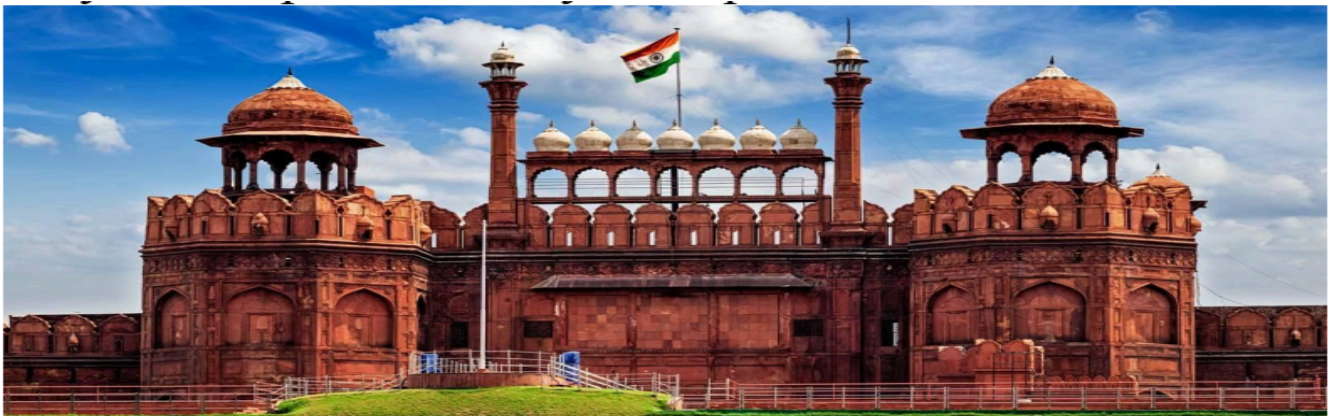
6. How much cloth material will be required to cover 2 big domes each of radius 2.5metres?
(A) 75m²
(B) 78.57m²

(C) 87.47m²
(D) 25.8m²

ANS:
(B) 78.57m²Cloth material required = 2 × 2π r² = 4 ×22/7 × 2.5 ×2.5 = 78.57m²

7. Write the formula to find the total surface area of a hemisphere.

(A) $2\pi r^2$
(B) $4\pi r^2$
(C) πr^2
(D) $3\pi r^2$
ANS:
(D) $3\pi r^2$
Total surface area of a hemisphere= $2\pi r^2 + \pi r^2 = 3\pi r^2$
8. If the area of one dome is 100 m² then what is the area of 7 such domes?
(A) 300 m²
(B) 700 m²
(C) 900m²
(D) 345.2 m²

Area of one dome = 100 m²
Area of 7 domes = 100 ×7 m² = 700 m²
9. How much is the volume of a hemisphere if the radius of the base is 3.5m?

(A) 85.9 m³
(B) 80 m³
(C) 98 m³
(D)89.83 m³
ANS: (D)89.83 m³
r =3.5   m,
 Volume of hemisphere= 2/3 πr^3 = 2/3 × 22/7 × 3.5 ×3.5 ×3.5=89.83 cubic m

10 What is the ratio of sum of volumes of two hemispheres of radius 1cm each to the
 volume of a sphere of radius 2cm?
(A) 1:1
 (B) 1:8
 (C) 8:1

(D) 1:16

Volume of 2 hemispherical of radius 1 cm = $2 \times \frac{2}{3}\pi r^3 = \frac{4}{3}\pi$ cm³

Volume of 1 hemispherical of radius 2 cm = $2 \times \frac{2}{3}\pi r^3 = \frac{32}{3}\pi$ cm³

Required Ratio = 1:8