Exercise 13.3                                                    Page No: 221

1. **Diameter of the base of a cone is 10.5 cm and its slant height is 10 cm. Find its curved surface area (Assume  $\pi = 22/7$)**

Solution:

Radius of the base of cone = diameter/ 2 = (10.5/2) cm = 5.25 cm
Slant height of cone, say l = 10 cm
CSA of cone is = πrl
 = (22/7 x 5.25 x 10) = 165
Therefore, the curved surface area of the cone is 165 cm².

2. **Find the total surface area of a cone, if its slant height is 21 m and diameter of its base is 24 m. (Assume  $\pi = 22/7$)**

Solution:

Radius of cone, r =  24/2 m = 12m

Slant height, l = 21 m
Formula: Total Surface area of the cone = πr(l + r)
Total Surface area of the cone = 22/7 x 12 x (21 + 12) m²
= 1244.57m²

3. **Curved surface area of a cone is 308 cm² and its slant height is 14 cm. Find**
**(i) radius of the base and (ii) total surface area of the cone.**
**(Assume π=22/7)**

Solution:

Slant height of cone, l = 14 cm
Let the radius of the cone be r.
(i)We know, CSA of cone = πrl
Given: Curved surface area of a cone is 308 cm²
 (308 ) = (22/7 x r x 14)
308 = 44 r
r = 308/44 = 7
Radius of a cone base is 7 cm.
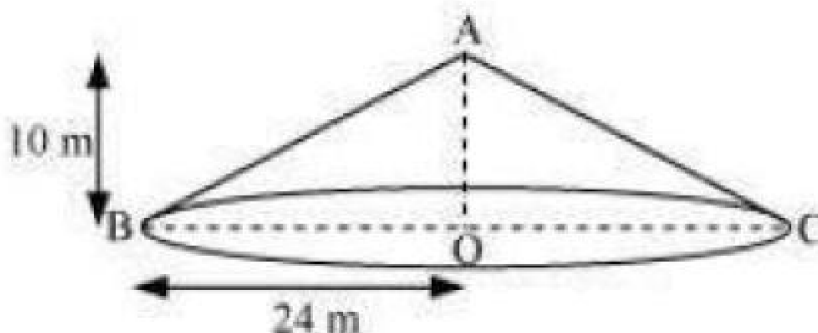
(ii) Total surface area of cone = CSA of cone + Area of base (πr²)
Total surface area of cone = 308 + 22/7 x 7² = 308 + 154
 Therefore, the total surface area of the cone is 462 cm².

4. **A conical tent is 10 m high and the radius of its base is 24 m. Find**
   **(i) slant height of the tent.**
   **(ii)cost of the canvas required to make the tent, if the cost of 1 m² canvas is Rs 70.**
    **(Assume π=22/7)**
Solution:



Let ABC be a conical tent
Height of conical tent, h = 10 m

Radius of conical
tent, r = 24 m
Let the slant height of the tent be l.

(i)In right triangle, ABO,

$AB^2 = AO^2 + BO^2$ (using Pythagoras theorem)
$l^2 = h^2 + r^2$
$= (10)^2 + (24)^2$
$= 676$

$l = 26$
Therefore, the slant height of the tent is 26 m.

(ii) CSA of tent $= \pi rl$
$= (22/7 \times 24 \times 26)$ m$^2$
Cost of 1 m$^2$ canvas = Rs 70
Cost of (13728/7)m$^2$ canvas is equal to Rs (13728/7) x 70 = Rs 137280

Therefore, the cost of the canvas required to make such a tent is Rs 137280.

5. **What length of tarpaulin 3 m wide will be required to make conical tent of height 8 m and base radius 6m? Assume that the extra length of material that will be required for stitching margins and wastage in cutting is approximately 20 cm. [Use $\pi$=3.14]**

Solution:

Height of conical tent, h = 8 m
Radius of base of tent, r = 6 m
Slant height of tent, $l^2 = (r^2 + h^2)$
$l^2 = (6^2 + 8^2) = (36 + 64) = (100)$
or l = 10

Again, CSA of conical tent $= \pi rl$
$= (3.14 \times 6 \times 10)$ m$^2$
$= 188.4$ m$^2$

Let the length of tarpaulin sheet required be L
As 20 cm will be wasted, therefore,
Effective length will be ( L - 0.2 m).
Breadth of tarpaulin = 3m (given)
Area of sheet = CSA of tent
$[(L - 0.2) \times 3] = 188.4$
L - 0.2 = 62.8
L = 63

Therefore, the length
of the required tarpaulin sheet will be 63m.

**6. The slant height and base diameter of conical tomb are 25 m and 14 m respectively. Find the cost of white-washing its curved surface at the rate of Rs. 210 per 100 m². (Assume $\pi$ = 22/7)**

Solution:

Slant height of conical tomb, l = 25m
Base radius, r = diameter/2 = 14/2 m = 7m
CSA of conical tomb = πrl
= 22/7 x 7 x 25 = 550

CSA of conical tomb = 550m²
Cost of white-washing 550 m² area, which is Rs (210 x 550)/100
= Rs. 1155
Therefore, cost will be Rs. 1155 while white-washing tomb.

6. **A joker's cap is in the form of right circular cone of base radius 7 cm and height 24 cm. Find the area of the sheet required to make 10 such caps. (Assume $\pi$=22/7)**

Solution:

Radius of conical cap, r = 7 cm
Height of conical cap, h = 24 cm
Slant height, l² = (r² + h²)
= (7² + 24²)
= ( 49 + 576)
= (625)
Or l = 25 cm
CSA of 1 conical cap = π r l
= 22/7 x 7 x 24
= 550
CSA of 10 caps = (10 x 550) cm² = 5500 cm²
Therefore, the area of the sheet required to make 10 such caps is 5500 cm² .

7. **A bus stop is barricaded from the remaining part of the road, by using 50 hollow cones made of recycled cardboard. Each cone has a base diameter of 40 cm and height 1 m. If the outer side of each of the cones is to be painted and the cost of painting is Rs. 12 per m², what will be the cost of painting all these cones? (Use $\pi$ = 3.14 and take $\sqrt{(1.04)}$ = 1.02)**

Solution:
Given:
Radius of cone, r = diameter/2 = 40/2 cm = 20 cm = 0.2 m
Height of cone, h = 1 m

Slant height of cone
is l, and $l^2 = (r^2 + h^2)$
Using given values, $l^2 = (0.2^2 + 1^2)$
= (1.04)
Or l = 1.02
Slant height of the cone is 1.02 m

Now,
CSA of each cone = πrl
= (3.14 x 0.2 x 1.02)
= 0.64056

CSA of 50 such cones = (50 x 0.64056) = 32.028
CSA of 50 such cones = 32.028 $m^2$
Again,
Cost of painting 1 $m^2$ area = Rs 12 (given)
Cost of painting 32.028 $m^2$ area = Rs (32.028 x 12)
= Rs.384.336
= Rs.384.34 (approximately)
Therefore, the cost of painting all these cones is Rs. 384.34.