Exercise 6.1

1. The length of the edge of a cube is 4 cm.
   Find (*i*) the total surface area (*ii*) volume of the cube
2. Find the volume, the total surface area and the lateral surface area of a rectangular solid 6 m long, 4.5 m broad and 80 cm high.
3. The total surface area of a cube is 384 cm^2, find its volume.
4. Two cubes each of volume 64 cm^3 are joined end to end. Find the surface area of the resulting cuboid.
5. Six cubes each with 12 cm edge are joined end to end. Find the surface area of the cuboid so formed.
6. Two cubes, each of volume 512 cm^3, are joined end to end. Find the surface area of the resulting cuboid.
7. What is the area of the cardboard needed to make rectangular box 12 cm long, 2 cm wide and 5 cm high?
8. The breadth of a room is twice its height and half its length. The volume of the room is 512 m^3. Find its dimensions.
9. The length of a hall is 20 m and width 16 m. The sum of the areas of the floor and the flat roof is equal to the areas of the four walls. Find the height of the hall.
10. The dimensions of a metallic cuboid are 100 cm, 80 cm and 64 cm. If it is melted and recast into a cube, find the surface area of the cube so formed.
11. The outer dimensions of a closed box are 42 cm, 30 cm, and 20 cm. The box is made of wood of thickness 1 cm, determine the volume of the wood used.
12. A closed iron tank 12 m long, 9 m wide and 4 m deep is to be made. Determine the cost of iron sheet used at the rate of ₹ 5 per metre, the sheet being 2 m wide.
13. A granary is in the shape of a cuboid of size 8 m × 6 m × 3 m. If a bag of grain occupies a space of 0.65 m^3, how many bags can be stored in the granary?
14. A reservoir is in the form of a rectangular parallelopiped (cuboid). Its length is 20 m. If 18 kl of water is removed from the reservoir, the water level goes down by 15 cm. Find the width of the reservoir. (1 kl = 1 m^3)
15. The dimensions of a cinema hall are 100 m, 50 m and 18 m. How many persons can sit in the hall, if each person require 150 m^3 of air?

16. Each edge of a cube is increased by 50%. Find the percentage increase in the surface area of the cube.

17. An open box is made of wood 3 cm thick. Its external length is 1.48 m, width 1.16 m and height 8.3 dm. Find the cost of painting the inner surface at ₹ 5 per m^2.

18. A tank 12 m long, 8 m wide and 5 m deep is to be made. It is open at the top. Determine the cost of iron sheet, at the rate of ₹ 3.50 per metre, if the sheet is 4 m wide.

19. A cuboid contains some water. The base of the cuboid is 15 cm × 12 cm. A cube of 10 cm edge is placed in the water and is completely submerged. How much high will the level of water rise?

[**Hint:** Let x cm be the rise in water level in the vessel.

Then volume of cube = volume of water replaced by the cube

$\Rightarrow \quad 10 \times 10 \times 10 = 15 \times 12 \times x$

$\Rightarrow \quad x = \frac{1000}{15 \times 12} = \frac{1000}{180} = \frac{50}{9} = 5.56$ cm]

20. The length, breadth and height of a rectangular solid are in the ratio of 5 : 4 : 2. If the total surface area is 1216 cm^2, find the length, breadth and height of the solid.

21. 500 men took dip in a tank which is 80 m long and 50 m broad. What is rise in water level if the average displacement of water by a man is 5 m^3?

22. A metal cube of edge 12 cm is melted and formed into three smaller cubes. If the edges of two smaller cubes are 6 cm and 8 cm, find an edge of the third smaller cube.

23. How many planks each of which is 2 m long, 2.5 cm broad and 4 cm thick can be cut off from a wooden block 6 m long, 15 cm broad and 40 cm thick?

24. The volume of a rectangular solid is 5400 cm^3. If it is 20 cm long and 15 cm high, find its breadth and whole surface area.

25. The whole surface of a cuboid is 214 cm^2, volume is 210 cm^3 and the area of the base is 42 cm^2. Find its edges.

26. A wall of length 10 m was to be built across an open ground. The height of the wall is 4 m and thickness of wall is 24 cm. If this wall is to be built up with bricks whose dimensions are 24 cm × 12 cm × 8 cm, how many bricks would be required?

27. The volume of a cuboid is twice the volume of a cube. If the dimensions of cuboid are 9 cm, 8 cm and 6 cm, find the total surface area of the cube.

28. The dimensions of a field are 12 m by 10 m. A pit 5 m long, 4 m wide and 2 m deep is dug in one corner of the field and the earth removed has been spread over the remaining area of the field. Calculate by how much is the level of the field raised?

[**Hint:** Area of the field = 12 m × 10 m = 120 m^2

Volume of earth dug out = 5 m × 4 m × 2 m = 40 m^3

Area of remaining field = Area of field – Area of base of tank

= 120 m^2 – (5 m × 4 m) = 120 m^2 – 20 m^2

= 100 m^2

Let rise in the field level = h m

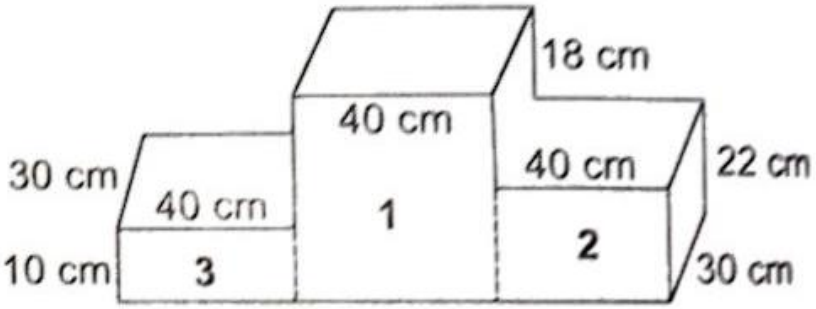
Volume of raised field = Volume of earth dug out

$100 \times h = 40$

$\Rightarrow \quad h = \frac{40}{100} = \frac{2}{5} = 0.4$ m = 40 cm]

29. A rectangular glass vessel with dimension 12 cm × 5 cm × 4 cm is partly filled with water. If a rectangular block of iron measuring 3 cm × 2 cm × 1.5 cm is wholly immersed in water, by how much will the water level rise?

30. In the given figure, a podium is shown, whose each face is rectangular. Find its volume (in cm^3). In the fig., **1** represents winner, **2** for first runner-up and **3** for second runner-up.



Answers

1. (*i*) 96 cm^2, (*ii*) 64 cm^3 **2.** 21.6 m^3, 70.8 m^2, 16.8 m^2 **3.** 512 cm^3

4. 160 cm^2 **5.** 3744 cm^2 **6.** 640 cm^2 **7.** 188 cm^2

8. 16 m, 8 m, 4 m **9.** 8.89 m **10.** 38,400 cm^2 **11.** 5040 cm^3

12. ₹ 960 **13.** 221 bags **14.** 6m **15.** 600

16. 125% **17.** ₹ 27.97 **18.** ₹ 259 **19.** 5.56 cm

20. 20 cm, 16 cm, 8 cm **21.** 62.5 cm **22.** 10 cm

23. 180 **24.** 18 cm, 1860 cm^2

25. 7 cm, 6 cm, 5 cm **26.** 4167 **27.** 216 cm^2

28. 40 cm **29.** 0.15 cm **30.** 86400 cm^3