

## EXERCISE # 1

### A. Very Short Answer Type Questions

- Q.1** Find the surface area of a chalk box whose length, breadth and height are 16 cm, 8 cm and 6 cm, respectively.
- Q.2** Three cubes each of side 5 cm are joined end to end. Find the surface area of the resulting cuboid.
- Q.3** Find the area of the four walls of a room whose length is 6m, breadth 5m and height 4m. Also find the cost of white-washing the walls, if the rate of white washing is Rs. 5 per square meter (Door, Windows and other openings ignored).
- Q.4** The length of a cold storage is double its breadth. Its height is 3 meters. The area of its four walls (including doors) is  $108 \text{ m}^2$ . Find its volume.
- Q.5** The volume of a cuboid is  $440 \text{ cm}^3$  and the area of its base is  $88 \text{ cm}^2$ . Find its height.
- Q.6** The volume of a cube is 1,000 cm. Find its total surface area.
- Q.7** The curved surface area of a right circular cylinder of height 14 cm is  $88 \text{ cm}^2$ . Find the diameter of the base of the cylinder.
- Q.8** The ratio between the curved surface area and the total surface area of a right circular cylinder is 1 : 2. Find the ratio between the height and radius of the cylinder.
- Q.9** Find the volume of a right circular cylinder, if the radius (r) of its base and height (h) are 7 cm and 15 cm respectively.
- Q.10** The area of the base of a right circular cylinder is  $154 \text{ cm}^2$  and its height is 12 cm. Find the volume of the cylinder.
- Q.11** The diameter of a cone is 14 cm and its slant height is 9 cm. Find the area of its curved surface.

- Q.12** Find the total surface area of a cone, if its slant height is 9 m and the radius of its base is 12 m.
- Q.13** Find the volume of a right circular cone 1.02 m high, if the radius of its base is 28 cm.
- Q.14** The area of the base of a right circular cone is  $314 \text{ cm}^2$  and its height is 15 cm. Find the volume of the cone.
- Q.15** Find the surface area of a sphere of radius 7 cm.
- Q.16** Find the surface area and total surface area of a hemisphere of radius 21 cm.
- Q.17** Find the volume of a sphere of radius 7 cm.
- Q.18** Find the volume of hemisphere of radius 3.5 cm.

### B. Short Answer Type Questions

- Q.19** The dimensions of a cuboid are in the ratio of 1 : 2 : 3 and its total surface area is  $88 \text{ m}^2$ . Find the dimension.
- Q.20** A swimming pool is 20 m in length, 15 m in breadth, and 4 m in depth. Find the cost of cementing its floor and walls at the rate of Rs 12 per square meter.
- Q.21** The floor of a rectangular hall has a perimeter 250 m. If the cost of painting the four walls at the rate of 10 per  $\text{m}^2$  is Rs 15000. Find the height of the hall.
- Q.22** The sum of length, breadth and depth of a cuboid is 19 cm and the length of its diagonal is 11 cm. Find the surface area of the cuboid.
- Q.23** A cube of 9 cm edge is immersed completely in a rectangular vessel containing water. If the dimensions of the base are 15 cm and 12 cm. Find the rise in water level in the vessel.

- Q.24** Three cubes whose edges measure 3 cm, 4 cm and 5 cm respectively to form a single cube. Find its edge. Also, find the surface area of the new cube.
- Q.25** A reservoir is in the form of a rectangular parallelepiped (cuboid). Its length is 20 m. If 18 kλ of water is removed from the reservoir, the water level goes down by 15 cm. Find the width of the reservoir (1 kλ = 1 m<sup>3</sup>).
- Q.26** The outer dimensions of a closed wooden box are 10 cm by 8 cm by 7 cm. Thickness of the wood is 1 cm. Find the total cost of wood required to make box if 1 cm<sup>3</sup> of wood cost Rs 2.00.
- Q.27** Water flows in a tank 150 m × 100 m at the base, through a pipe whose crosssection is 2 dm by 1.5 dm at the speed of 15 km per hour. In what time, will the water be 3 metres deep.
- Q.28** An iron pipe 20 cm long has exterior diameter equal to 25 cm. If the thickness of the pipe is 1 cm, find the whole surface of the pipe.
- Q.29** The diameter of a roller 120 cm long is 84 cm. If it takes 500 complete revolutions to level a playground, determine the cost of levelling it at the rate of 30 paise per square metre.
- Q.30** The thickness of a hollow wooden cylinder is 2 cm. It is 35 cm long and its inner radius is 12 cm. Find the volume of the wood required to make the cylinder, assuming it is open at either end.
- Q.31** The circumference of the base of a cylindrical vessel is 132 cm and its height is 25 cm. How many liters of water can it hold ?
- Q.32** The volume of a cylinder is  $448\pi$  cm<sup>3</sup> and height 7 cm. Find its lateral surface area and total surface area.
- Q.33** The volume of metallic cylindrical pipe is 748 cm<sup>3</sup>. Its length is 14 cm and its external radius is 9 cm. Find its thickness.
- Q.34** The circumference of the base of a 10 m high conical tent is 44 metres. Calculate the length of canvas used in making the tent if width of canvas is 2 m. (Use  $\pi = 22/7$ ).
- Q.35** The base radii of two right circular cones of the same height are in the ratio 3 : 5. Find the ratio of their volumes.
- Q.36** A right circular cone is 3.6 cm high and radius of its base is 1.6 cm. It is melted and recast into a right circular cone with radius of its base as 1.2 cm. Find its height.
- Q.37** A solid cube of side 7 cm is melted to make a cone of height 5 cm, find the radius of the base of the cone.
- Q.38** The radius and height of a cone are in the ratio 3 : 4. If its volume is 301.44 cm<sup>3</sup>, what is its radius ? What is its slant height ? (Take  $\pi = 3.14$ )
- Q.39** The internal and external diameters of a hollow hemi-spherical vessel are 24 cm and 25 cm respectively. The cost of paint one sq. cm of the surface is 7 paise. Find the total cost to paint the vessel all over. (ignore the area of edge).
- Q.40** A toy is in the shape of a right circular cylinder with a hemisphere on one end and a cone on the other. The height and radius of the cylindrical part are 13 cm and 5 cm respectively. The radii of the hemispherical and conical parts are the same as that of the cylindrical part. Calculate the surface area of the toy if height of the conical part is 12 cm.
- Q.41** Find the volume of a sphere whose surface area is 154 square cm.
- Q.42** A solid sphere of radius 3 cm is melted and then cast into small spherical balls each of diameter 0.6 cm. Find the number of balls thus obtained.
- Q.43** How many spherical bullets can be made out of a solid cube of lead whose edge measures 44 cm, each bullet being 4 cm in diameter.

**Q.44** Three solid spheres of iron whose diameters are 2 cm, 12 cm and 16 cm, respectively, are melted into a single solid sphere. Find the radius of the solid sphere.

**Q.45** A sphere of diameter 6 cm is dropped in a right circular cylindrical vessel partly filled with water. The diameter of the cylindrical vessel is 12 cm. If the sphere is completely submerged in water, by how much will the level of water rise in the cylindrical vessel ?

**Q.46** A spherical canon ball, 28 cm in diameter is melted and cast into a right circular conical mould, the base of which is 35 cm in diameter. Find the height of the cone, correct to one placed of decimal.

## **ANSWER KEY**

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### **A. VERY SHORT ANSWER TYPE :**

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|--------------------------|-----------------------------|---------------------------|--------------------------|--------------------------|
| 1. 544 cm <sup>2</sup>   | 2. 350 cm <sup>2</sup>      | 3. Rs. 440                | 4. 216 m <sup>3</sup>    | 5. 5 cm                  |
| 6. 600 cm <sup>2</sup>   | 7. 2 cm                     | 8. 1 : 1                  | 9. 2310 cm <sup>3</sup>  | 10. 2310 cm <sup>3</sup> |
| 11. 198 cm <sup>2</sup>  | 12. 792 m <sup>2</sup>      | 13. 83776 cm <sup>3</sup> | 14. 1570 cm <sup>3</sup> | 15. 616 cm <sup>2</sup>  |
| 16. 4158 cm <sup>2</sup> | 17. 1437.33 cm <sup>3</sup> | 18. 89.83 cm <sup>3</sup> |                          |                          |

### **B. SHORT ANSWER TYPE :**

- |                              |                          |                            |                            |                          |
|------------------------------|--------------------------|----------------------------|----------------------------|--------------------------|
| 19. 2 m, 4 m, 6 m            | 20. Rs. 6960             | 21. 6 m                    | 22. 240 cm <sup>2</sup>    | 23. 4.05 cm              |
| 24. 6 m, 216 cm <sup>2</sup> | 25. 6 m                  | 26. Rs. 640                | 27. 100 Hours              | 28. 3168 cm <sup>2</sup> |
| 29. Rs. 475.20               | 30. 5720 cm <sup>3</sup> | 31. 34.65 liters           | 32. 754.28 cm <sup>2</sup> | 33. 1 cm                 |
| 34. 134.2 m                  | 35. 9 : 25               | 36. 6.4 cm                 | 37. 8.09 cm                | 38. 6 cm, 10 cm          |
| 39. Rs. 132.11               | 40. 770 cm <sup>2</sup>  | 41. 179.66 cm <sup>2</sup> | 42. 1000                   | 43. 2541                 |
| 44. 9 cm                     | 45. 1 cm                 | 46. 35.84 cm               |                            |                          |

## EXERCISE # 2

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- Q.1** A cuboidal oil tin is 30 cm by 40 cm by 50 cm. Find the cost of the tin required for making 20 such tins if the cost of tin sheet is Rs 20 per square metre.
- Q.2** Length of a class-room is two times its height and its breadth is  $1\frac{1}{2}$  times its height. The cost of white-washing the walls at the rate of Rs 1.60 per  $\text{m}^2$  is Rs 179.20. Find the cost of tiling the floor at the rate of Rs 6.75 per  $\text{m}^2$ .
- Q.3** A room is half as long again as it is broad. The cost of carpeting the room at Rs 3.25 per  $\text{m}^2$  is Rs 175.50 and the cost of papering the walls at Rs 1.40 per  $\text{m}^2$  is Rs 240.80. If 1 door and 2 windows occupy  $8\text{ m}^2$ , find the dimensions of the room.
- Q.4** The cost of papering four walls of a room at 70 paise per square metre is Rs 157.50. The height of the room is 5 meters. Find the length and the breadth of the room if they are in the ratio 4 : 1.
- Q.5** A plot of land in the form of a rectangle has a dimension  $240\text{ m} \times 180\text{ m}$ . A drainlet 10 m wide is dug all around it (on the outside) and the earth dug out is evenly spread over the plot, increasing its surface level by 25 cm. Find the depth of the drainlet.
- Q.6** An agricultural field is in the form of a rectangle of length 20 m and width 14 m. A pit 6 m long, 3 m wide and 2.5 m deep is dug in a corner of the field and the earth taken out of the pit is spread uniformly over the remaining area of the field. Find the extent to which the level of the field has been raised.
- Q.7** A rectangular tank is 225 m by 162 m at the base. With what speed must water flow into it through an aperture 60 cm by 45 cm that the level may be raised 20 cm in 5 hours?
- Q.8** The external length, breadth and height of a closed rectangular wooden box are 18 cm, 10 cm and 6 cm respectively and thickness of wood is  $\frac{1}{2}$  cm. When the box is empty, it weighs 15 kg and when filled with sand it weighs 100 kg. Find the weight of the cubic cm of wood and cubic cm of sand.
- Q.9** A rectangular sheet of paper  $44\text{ cm} \times 18\text{ cm}$  is rolled along its length and a cylinder is formed. Find the radius of the cylinder.
- Q.10** A metal pipe is 77 cm long. The inner diameter of a cross section is 4 cm, the outer diameter being 4.2 cm. Find its [NCERT]  
(i) inner curved surface area  
(ii) outer curved surface area.  
(iii) total surface area
- Q.11** A solid cylinder has total surface area of 462 square cm. Its curved surface area is one-third of its total surface area. Find the volume of the cylinder. (Take  $\pi = \frac{22}{7}$ )
- Q.12** The difference between outside and inside surface of a cylindrical metallic pipe 14 cm long is  $44\text{ cm}^2$ . If the pipe is made of 99 cu centimeters of metal, find the outer and inner radii of the pipe.
- Q.13** A lead pencil consists of a cylinder of wood with a solid cylinder of graphite filled into it. The diameter of the pencil is 7 mm, the diameter of the graphite is 1 mm and the length of the pencil is 10 cm. Calculate the weight of the whole pencil, if the specific gravity of the wood is  $0.7\text{ gm/cm}^3$  and that of the graphite is  $2.1\text{ gm/cm}^3$ . [NCERT]
- Q.14** The radius and height of a cone are in the ratio 4 : 3. The area of the base is  $154\text{ cm}^2$ . Find the area of the curved surface.

- Q.15** A tent is of the shape of a right circular cylinder upto a height of 3 metres and then becomes a right circular cone with a maximum height of 13.5 metres above the ground. Calculate the cost of painting the inner side of the tent at the rate of Rs 2 per square metre, if the radius of the base is 14 metres.
- Q.16** If  $h$ ,  $C$ ,  $V$  are respectively the height, the curved surface and the volume of a cone, prove that  $3\pi Vh^3 - C^2h^2 + 9V^2 = 0$
- Q.17** A cone of height 24 cm has a curved surface area  $550 \text{ cm}^2$ . Find its volume.  
(Take  $\pi = 22/7$ ).
- Q.18** A conical tent is 9 m high and the radius of its base is 12 m.
- What is the cost of the canvas required to make it, if a square metre canvas costs Rs 10 ?
  - How many persons can be accommodated in the tent, if each person requires 2 square metre on the ground and  $15 \text{ m}^3$  of space to breathe in ?
- Q.19** A wooden toy is in the form of a cone surmounted on a hemisphere. The diameter of the base of the cone is 6 cm and its height is 4 cm. Find the cost of painting the toy at the rate of Rs 5 per  $1000 \text{ cm}^2$ .
- Q.20** The diameter of a sphere is decreased by 25%. By what percent its curved surface area decrease ?
- Q.21** A cylindrical container of radius 6 cm and height 15 cm is filled with ice-cream. The whole ice-cream has to be distributed to 10 children in equal cones with hemispherical tops. If the height of the conical portion is four times the radius of its base, find the radius of the ice-cream cone.
- Q.22** A solid wooden toy is in the shape of a right circular cone mounted on a hemisphere. If the radius of the hemisphere is 4.2 cm and the total height of the toy is 10.2 cm, find the volume of the wooden toy.
- Q.23** A vessel is in the form of a hemispherical bowl mounted by a hollow cylinder. The diameter of the sphere is 14 cm and the total height of the vessel is 13 cm. Find its capacity. (Take  $\pi = 22/7$ ).
- Q.24** A solid is in the form of a cylinder with hemispherical ends. The total height of the solid is 19 cm and the diameter of the cylinder is 7 cm. Find the volume and total surface area of the solid. (use  $\pi = 22/7$ ).

## ANSWER KEY

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|--|---|--|---|
| 1. Rs. 376                                     | 2. Rs. 324  | 3. $\lambda = 9 \text{ m}$ , $b = 6 \text{ cm}$ , $h = 6 \text{ cm}$ | 4. $\lambda = 18 \text{ m}$ , $b = 4.5 \text{ m}$       |
| 5. 1.227 m                                     | 6. 17.18 m  | 7. 5400 m/h  | 8. $\frac{1}{21} \text{ kg}$ , $\frac{1}{9} \text{ kg}$ |
| 9. 7 cm  | 10. (i) $968 \text{ cm}^2$ (ii) $1016.4 \text{ cm}^2$ (iii) $1984.4 \text{ cm}^2$ |  | 11. $539 \text{ cm}^3$                                  |
| 12. $R = 2.5 \text{ cm}$ , $r = 2 \text{ cm}$  | 13. 2.805 gm  |  | 14. $192.5 \text{ cm}^2$                                |
| 15. Rs. 2068                                   | 17. $1232 \text{ cm}^3$   | 18. (i) Rs. 5652 (ii) 90   | 19. 51 paise  |
| 20. 43.75%                                     | 21. 3 cm  | 22. $266.11 \text{ cm}^3$  | 23. $1642.66 \text{ cm}^3$                              |
| 24. $641.66 \text{ cm}^3$ , $418 \text{ cm}^2$ |   |  |   |