PRACTICE PAPER

ICSE CLASS 10 – MATHEMATICS

Chapter 20 : Cylinder, Cone and Sphere

(Mensuration : Surface Area and Volume)

Maximum Marks: 40 Time allowed: One and a half hours

1. *Answers to this Paper must be written on the paper provided separately.*
2. *You will not be allowed to write during the first 10 minutes. This time is to be spent in reading the question paper.*
3. ***The time given at the head of this Paper is the time allowed for writing the answers.***
4. *Attempt **all** questions from **Section A** and **any two** questions from **Section B**.*
5. ***All working, including rough work, must be clearly shown, and must be done on the same sheet as the rest of the answer.***
6. ***Omission of essential working will result in loss of marks.***
7. *The intended marks for questions or parts of questions are given in brackets [ ].*
8. *Take π = 22/7 unless stated otherwise. Figures given in the questions are rough sketches and are not drawn to scale.*

Question 1

Choose the correct answers to the questions from the given options. [8]

(Do not copy the question, write the correct answers only.)

(i) The curved surface area of a cylinder of radius 7 cm and height 10 cm is:

(a) 220 cm²
(b) 440 cm²
(c) 880 cm²
(d) 1540 cm²

(ii) The radius of the base of a cone is 6 cm and its height is 8 cm. Its slant height is:

(a) 14 cm
(b) 12 cm
(c) 10 cm
(d) 7 cm

(iii) The surface area of a sphere of radius 7 cm is:

(a) 154 cm²
(b) 308 cm²
(c) 462 cm²
(d) 616 cm²

(iv) The total surface area of a solid hemisphere of radius r is:

(a) $3\pi r^2$
(b) $2\pi r^2$
(c) $4\pi r^2$
(d) $(2/3)\pi r^3$

(v) The volumes of a cylinder and a cone having the same base radius and the same height are in the ratio:

(a) 1 : 3
(b) 3 : 1
(c) 2 : 3
(d) 3 : 2

(vi) A solid metal sphere of radius 3 cm is melted and recast into small spheres, each of radius 1 cm. The number of small spheres obtained is:

(a) 3
(b) 9
(c) 27
(d) 81

(vii) **Assertion (A):** The volume of a cone is equal to the volume of a cylinder having the same base and the same height.

Reason (R): The volume of a cone is $(1/3)\pi r^2 h$.

(a) (A) is true and (R) is false.
(b) (A) is false and (R) is true.
(c) Both (A) and (R) are true, and (R) is the correct explanation for (A).
(d) Both (A) and (R) are true, but (R) is not the correct explanation for (A).

(viii) **Assertion (A):** When a solid sphere is completely submerged in water in a cylindrical vessel, the water level rises.

Reason (R): A submerged solid displaces a volume of water equal to its own volume.

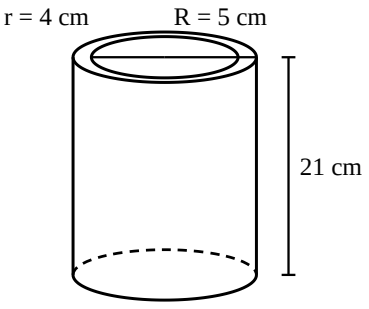
(a) (A) is true and (R) is false.
(b) (A) is false and (R) is true.
(c) Both (A) and (R) are true, and (R) is the correct explanation for (A).
(d) Both (A) and (R) are true, but (R) is not the correct explanation for (A).

Question 2

(i) The curved surface area of a cylinder is 1320 cm² and the radius of its base is 10.5 cm. Find (a) its height (b) its volume. [4]

(ii) The radius of the base of a cone is 21 cm and its height is 28 cm. Find (a) its slant height (b) its volume (c) its total surface area. [4]

(iii) The figure shows a hollow metal pipe of length 21 cm, external radius 5 cm and internal radius 4 cm. Find (a) the volume of the metal used (b) the mass of the pipe, if 1 cm³ of the metal has a mass of 8 g. [4]

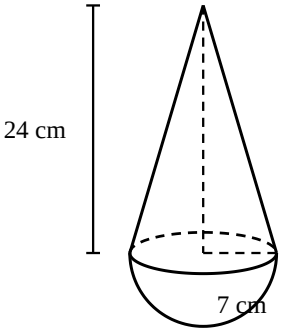


SECTION B (20 Marks)

*(Attempt **any two** questions from this Section.)*

Question 3

A toy is made by placing a cone of height 24 cm on a hemisphere of radius 7 cm, the base of the cone being the same as the flat face of the hemisphere (see figure).



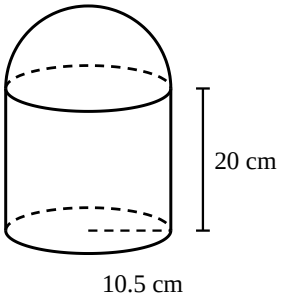
(i) Find the slant height and the curved surface area of the cone. [3]

(ii) Find the curved surface area of the hemisphere and the total surface area of the toy. [3]

(iii) Find the volume of the toy. [4]

Question 4

A solid is made of a cylinder of radius 10.5 cm and height 20 cm, with a hemisphere of the same radius attached on its top (see figure).



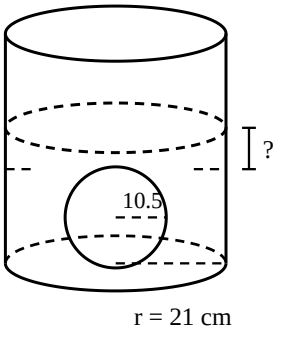
(i) Find the curved surface area of the cylindrical part. [3]

(ii) Find the curved surface area of the hemispherical part and the total surface area of the solid. [3]

(iii) Find the volume of the solid. [4]

Question 5

A cylindrical vessel of radius 21 cm contains water. A solid metal sphere of radius 10.5 cm is completely submerged in it, and the water level rises (see figure).



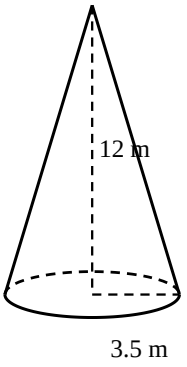
(i) Find the volume of the sphere. [3]

(ii) Find the rise in the level of the water. [3]

(iii) The sphere is taken out and melted into a solid cone of base radius 21 cm. Find the height of the cone. [4]

Question 6

A conical tent has a base radius of 3.5 m and a height of 12 m (see figure).



(i) Find the slant height of the tent. [3]

(ii) Find the volume of air enclosed in the tent. [3]

(iii) Find the length of canvas, 1.25 m wide, required to make the tent, and its cost at ₹ 90 per metre. (Ignore wastage.) [4]

— End of Question Paper —