MENSURATION
UNIT TEST

CLASS: 10 **MARKS:50**
SUB: MATHS **TIME: 1.30 Hrs.**

I. Choose the correct answer: **7 x 1 = 7**

1. If two solid hemispheres of same base radius r units are joined together along their bases, then curved surface area of this new solid is
(A) $4\pi r^2$ sq. u (B) $6\pi r^2$ sq. u (C) $3\pi r^2$ sq. u (D) $8\pi r^2$ sq. u.

2. The volume (in cm^3) of the greatest sphere that can be cut off from cylindrical log of wood of base radius 1 cm and height 5 cm is
(A) $\frac{4}{3}\pi$ (B) $\frac{10}{3}\pi$ (C) 5π (D) $\frac{20}{3}\pi$.

3. The height and radius of the cone of which the frustum is a part are h_1 units and r_1 units respectively. Height of the frustum is h_2 units and radius of the smaller base is r_2 units. If $h_1:h_2 = 1:2$ then $r_1:r_2$ is
(A) 1 : 3 (B) 1 : 2 (C) 2 : 1 (D) 3 : 1

4. A spherical ball of radius r_1 units is melted to make 8 new identical balls each of radius r_2 units. Then $r_1:r_2$ is
(A) 2:1 (B) 1:2 (C) 4:1 (D) 1:4

5. A frustum of a right circular cone is of height 16 cm with radii of its ends as 8 cm and 20 cm. Then, the volume of the frustum is
(A) 3328π cm^3 (B) 3228π cm^3 (C) 3240π cm^3 (D) 3340π cm^3

6. In a hollow cylinder, the sum of the external and internal radii is 14 cm and the width is 4 cm. If its height is 20 cm, the volume of the material in it is
(A) 5600π cm^3 (B) 1120π cm^3 (C) 56π cm^3 (D) 3600π cm^3.

7. The total surface area of a hemi-sphere is how much times the square of its radius
(A) π (B) 4π (C) 3π (D) 2π .

II. Answer any FIVE Questions: (Q.No.14 is compulsory) **5 x 2 = 10**

8. A garden roller whose length is 3 m long and whose radius is 1.4 m is rolled to level a garden.. How much area will it cover in 8 revolutions?

9. Find the diameter of a sphere whose surface area is 154 m^2.

10. A sphere, a cylinder and a cone are of the same radius, where as cone and cylinder are of same height. Find the ratio of their curved surface area.

11. The slant height of frustum of a cone is 5 cm and the radii of its ends are 4 cm and 1 cm. Find its curved surface area.

12. The ratio of the volumes of two cones is 2:3. Find the ratio of their radii if the height of second cone is double the height of the first.

13. If the ratio of radii of two spheres is 4:7, find the ratio of their volumes.

14. Find the volume of a cylinder whose height is 2 m and whose base area is $250m^2$.

III. Answer any FIVE questions: (Q.No.21 is compulsory) **5 x 5 = 25**

15. An industrial metallic bucket is in the shape of the frustum of a right circular cone whose top and bottom diameters are 10 m and 4m and whose height is 4m. Find the curved and total surface area of the bucket.

16. A conical container is fully filled with petrol. The radius is 10 m and the height is 15 m, If the container can release the petrol through its bottom at the rate of 25 cu.metre per minute, in how many minutes the container will be emptied. Round your answer to the nearest minute.

17. A hemispherical section is cut out from one face of a cubical block such that the diameter '*l*' of the hemisphere is equal to side length of the cube. Determine the surface area of the remaining solid.

18. A capsule is in the shape of a cylinder with two hemisphere stuck to each of its ends. If the length of the entire capsule is 12 mm and the diameter of the capsule is 3 mm, how much medicine it can hold?

19. A metallic sphere of radius 16 cm is melted and recast into small spheres each of radius 2 cm. How many small spheres can be obtained?
20. Water is flowing at the rate of 15 km per hour through a pipe of diameter 14 cm into a rectangular tank which is 50 m long and 44 m wide. Find the time in which the level of water in the tanks will rise by 21 cm.
21. If the radii of the circular ends of a frustum which is 45 cm high are 28 cm and 7 cm, find the volume of the Frustum.

IV. Answer all the question: **1 x 8 = 8**

22. Draw a circle of diameter 10 cm from a point P, which is 13 cm away from the centre. Draw the two tangents PA and PB to the circle and measure their lengths.

(OR)

Graph the following linear function $y = \frac{1}{2}x$. Identify the constant of variation and verify it with the graph. Also (i) find y when x = 9 (ii) find x when y = 7.5.