PMATHEMATICS
WORKSHEET_130625
CHAPTER 12 SURFACE AREAS AND VOLUMES

SUBJECT: MATHEMATICS BASIC **MAX. MARKS : 40**
CLASS : X **DURATION : 1½ hrs**

General Instructions:
(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.
(iv). There is no overall choice.
(v). Use of Calculators is not permitted

SECTION – A
Questions 1 to 10 carry 1 mark each.

1. If two solid hemispheres of the same base radius *r* are joined together along their bases, then curved surface area of this new solid is
(a) $4\pi r^2$ (b) $6\pi r^2$ (c) $3\pi r^2$ (d) $8\pi r^2$

2. The radius (in cm) of the largest right circular cone that can be cut out from a cube of edge 4.2 cm is _____ .
(a) 4.2 (b) 2.1 (c) 8.1 (d) 1.05

3. The radii of two cylinders are in the ratio 2 : 3 and their heights are in the ratio 5 : 3. The ratio of their volumes is
(a) 3 : 4 (b) 5 : 3 (c) 27 : 20 (d) 20 : 27

4. The shape of a gilli, in the gilli-danda game (see Fig.), is a combination of

(a) two cylinders (b) a cone and a cylinder
(c) two cones and a cylinder (d) two cylinders and a cone

5. Two identical solid cubes of side k units are joined end to end. What is the volume, in cubic units, of the resulting cuboid?
(a) k^3 (b) $2k^3$ (c) $3k^3$ (d) $6k^3$

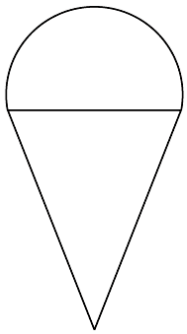
6. Volumes of two spheres are in the ratio 27 : 64. The ratio of their surface areas is:
(a) 3 : 4 (b) 4 : 3 (c) 9 : 16 (d) 16 : 9

7. The radius of a sphere (in cm) whose volume is 12π cm^3, is
(a) 3 cm (b) $3\sqrt{3}$ cm (c) $3^{2/3}$ cm (d) $3^{1/3}$ cm

8. Two cubes each with 6 cm edge are joined end to end. The surface area of the resulting cuboid is:
(a) 180 cm^2 (b) 360 cm^2 (c) 300 cm^2 (d) 260 cm^2

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:
(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.

9. **Assertion (A):** Total Surface area of the top is the sum of the curved surface area of the hemisphere and the curved surface area of the cone.
Reason (R): Top is obtained by joining the plane surfaces of the hemisphere and cone together.



10. **Assertion (A):** If two identical solid cube of side 7 cm are joined end to end. Then the total surface area of the resulting cuboid is 490 cm^2.
Reason (R): Total surface area of cuboid = lb + bh + hl

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. Two cubes each of volume 64 cm^3 are joined end to end. Find the surface area of the resulting cuboid.

12. Rachel, an engineering student, was asked to make a model shaped like a cylinder with two cones attached at its two ends by using a thin aluminium sheet. The diameter of the model is 3 cm, and its length is 12 cm. If each cone has a height of 2 cm, find the volume of air contained in the model that Rachel made. (Assume the outer and inner dimensions of the model are nearly the same.)

13. A cubical block of side 7 cm is surmounted by a hemisphere. What is the greatest diameter the hemisphere can have? Find the surface area of the solid.

14. Two cones with same base radius 8 cm and height 15 cm are joined together along their bases. Find the surface area of the shape so formed.

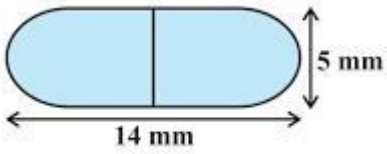
SECTION – C

Questions 15 to 17 carry 3 marks each.

15. A toy is in the form of a cone of radius 3.5 cm mounted on a hemisphere of same radius. The total height of the toy is 15.5 cm. Find the total surface area of the toy.

16. From a solid cube of side 7 cm, a conical cavity of height 7 cm and radius 3 cm is hollowed out. Find the volume of the remaining solid.

17. A medicine capsule is in the shape of a cylinder with two hemispheres stuck to each of its ends. The length of the entire capsule is 14 mm, and the diameter of the capsule is 5 mm. Find its surface area.



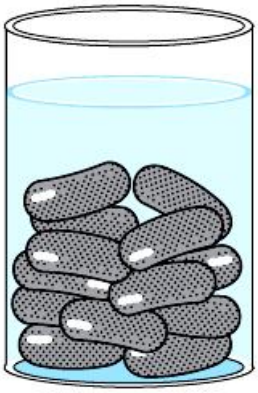
SECTION – D

Questions 18 carry 5 marks.

18. A tent is in the shape of a cylinder surmounted by a conical top. If the height and diameter of the cylindrical part are 2.1 m and 4 m, respectively, and the slant height of the top is 2.8 m, find the area of the canvas used for making the tent. Also, find the cost of the canvas of the tent at the rate of Rs 500 per m^2. (Note that the base of the tent will not be covered with canvas.)

OR

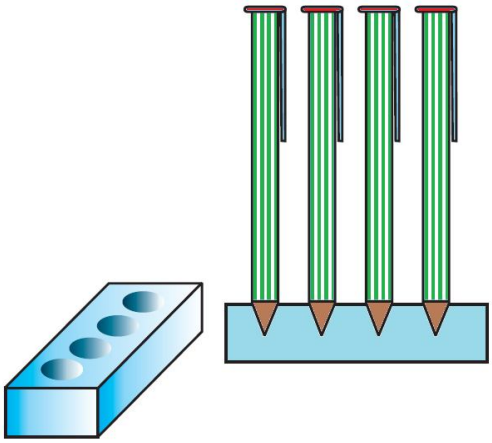
A gulab jamun contains sugar syrup up to about 30% of its volume. Find approximately how much syrup would be found in 45 gulab jamuns, each shaped like a cylinder with two hemispherical ends with a length of 5 cm and a diameter of 2.8 cm (see figure).



SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. A pen stand made of wood is in the shape of a cuboid with four conical depressions to hold pens. The dimensions of the cuboid are 15 cm by 10 cm by 3.5 cm. The radius of each of the depressions is 0.5 cm and the depth is 1.4 cm.



Based on the above information, answer the following questions.

(i) Find the volume of four conical depressions in the entire stand [2]

(ii) Find the volume of wood in the entire stand [2]

OR

(ii) Three cubes each of side 15 cm are joined end to end. Find the total surface area of the resulting cuboid. [2]

20. The word 'circus' has the same root as 'circle'. In a closed circular area, various entertainment acts including human skill and animal training are presented before the crowd.

A circus tent is cylindrical upto a height of 8 m and conical above it. The diameter of the base is 28 m and total height of tent is 18.5 m.

Based on the above, answer the following questions:

(i) Find slant height of the conical part. (1)

(ii) Determine the floor area of the tent. (1)

(iii) (a) Find area of the cloth used for making tent. (2)

OR

(b) Find total volume of air inside an empty tent.