Maxprap. Chapter wise Series Class 10th – Mathematics

Class : 10th **Topic : Surface Area and Volume**

Max. Marks : 50 **Duration : 2 Hrs**

Sections: A (MCQs), B (Short Answer-I), C (Short Answer-II), D (Long Answer), E (Case-Based).

General Instructions:

(i). All questions are compulsory.
(ii). This question paper contains 23 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 5 questions of 2 marks each. Section C comprises of 4 questions of 3 marks each. Section D comprises of 2 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

1. The shape of a gilli in the gilli - danda game is a combination of

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

2. A solid is hemispherical at the bottom and conical above. If the surface areas of the two parts are equal, then the ratio of its radius and the height of its conical part is

a) 1 : 1 b) $\sqrt{3}:1$ c) 1 : 3 d) $1:\sqrt{3}$

3. The curved surface area of a cylindrical pillar is 264 m^2 and its volume is 924 m^3 . The height of the pillar is

a) 5 m b) 4 m c) 6 m d) 7 m

4. A cylindrical vessel of radius 4 cm contains water. A solid sphere of radius 3 cm is lowered into the water until it is completely immersed. The water level in the vessel will rise by

a) $\frac{4}{9}$ cm b) $\frac{9}{4}$ cm c) $\frac{2}{9}$ cm d) $\frac{9}{2}$ cm

5. A solid spherical ball fits exactly inside the cubical box of side 2a. The volume of the ball is

a) $\frac{32}{3}\pi a^3$ b) $\frac{16}{3}\pi a^3$ c) $\frac{1}{6}\pi a^3$ d) $\frac{4}{3}\pi a^3$

6. An ice cream cone has hemispherical top. If the height of the cone is 9 cm and base radius is 2.5 cm, then the volume of ice cream is

a) 91.67 cm^3 b) 96.67 cm^3 c) 91.76 cm^3 d) 90.67 cm^3

7. A cubical block of side 7 cm is surmounted by a hemisphere. The greatest diameter of the hemisphere is

a) 3.5cm b) 10.5cm c) 7cm d) 14cm

8. The radii of the base of a cylinder and a cone are in the ratio 3 :4. If they have their heights in the ratio 2 : 3, the ratio between their volumes is

a) 8 : 9 b) 3 : 4 c) 9 : 8 d) 4 : 3

Assertion(A)/Reason(R) Based (9-10): In the following questions, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

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

9. Assertion (A): Two identical solid cubes of side 5 cm are joined end to end. The total surface area of the resulting cuboid is 300 cm^2 .
Reason (R): Total surface area of a cuboid is 2(lb + bh + lh)

10. Assertion (A): A sphere of radius 7 cm is mounted on the solid cone of radius 6 cm and height 8 cm. The volume of the combined solid is 1737.97 cm^3 .
Reason (R): Volume of sphere is $\frac{4}{3}\pi r^3$.

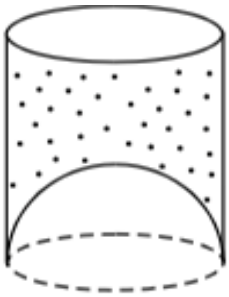
SECTION – B

Questions 11 to 15 carry 2 marks each

11. 3 cubes each of 8 cm edge are joined end to end. Find the total surface area of the cuboid so formed.

12. A vessel is in the form of a hollow hemisphere mounted by a hollow cylinder. The diameter of the hemisphere is 14 cm and the total height of the vessel is 13 cm. Find the inner surface area of the vessel.

13. A juice seller was serving his customers using glasses as shown in Figure. The inner diameter of the cylindrical glass was 5 cm but bottom of the glass had a hemispherical raised portion which reduced the capacity of the glass. If the height of a glass was 10 cm, find the apparent and actual capacity of the glass. (Useπ = 3.14)



14. A solid is in the form of a cylinder with hemi - spherical ends of samen radii. The total height of the solid is 20 cm and the diameter of the cylinder is 14 cm. Find the surface area of the solid.

15. A juice glass is cylindrical in shape with hemi - spherical raised up portion at the bottom. The inner diameter of glass is 10 cm and its height is 14 cm. Find the capacity of the glass.(useπ = 3.14)

SECTION – C

Questions 16 to 19 carry 3 marks each

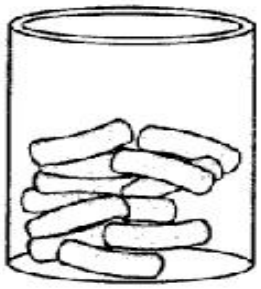
16. A toy is in the form of a cylinder with hemispherical ends. If the whole length of the toy is 90 cm and its diameter is 42 cm, find the cost of painting the toy at the rate of 70 paise per sq cm.

17. From a solid cylinder whose height is 2.4 cm and diameter 1.4 cm, a conical cavity of the same height and same diameter is hollowed out. Find the total surface area of the remaining solid to the nearest cm^2 .

18. A solid toy is in the form of a hemisphere surmounted by a right circular cone if the height of the cone is 4 cm and diameter of the base is 6 cm,
calculate:

a) The volume of the toy
b) The surface area of the toy.[Useπ = 3.14]

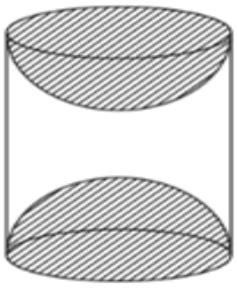
19. A gulab jamun, contains sugar syrup up to about 30% of its volume. Find approximately how much syrup would be found in 45 gulab jamun, each shaped like a cylinder with two hemispherical ends with length 5 cm and diameter 2.8 cm.



SECTION – D

Questions 20 to 21 carry 5 marks each

20. A wooden article was made by scooping out a hemisphere from each end of a solid cylinder. If the height of the cylinder is 15 cm and its base is of radius 4.2 cm, then find the total surface area of the article.



21. From a solid cylinder of height 8 cm and radius 6 cm, a conical cavity of the same height and same radius is carved out. Find the total surface area of the remaining solid. (Takeπ = 3.14)

SECTION – E (Case Study Based Questions)

Questions 22 & 23 carry 4 marks each

22. Read the following text carefully and answer the questions that follow:

A **circus** is a company of performers who put on shows of acrobats, clowns etc. to entertain people started around 250 years back, in open fields, now generally performed in tents.

One such **Circus Tent** is shown below.

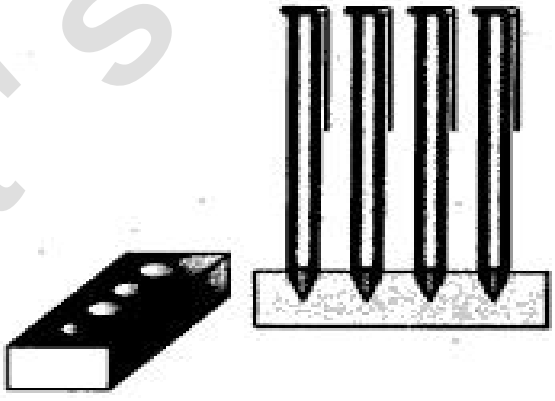
The tent is in the shape of a cylinder surmounted by a conical top. If the height and diameter of cylindrical part are 9 m and 30 m respectively and height of conical part is 8 m with the same diameter as that of the cylindrical part, then find

a) the area of the canvas used in making the tent. (3)
b) the cost of the canvas bought for the tent at the rate₹ 200 per sq m, if 30 sq m canvas was wasted during stitching. (1)

23. Read the following text carefully and answer the questions that follow:

A carpenter in the small town of Bareilly used to make and sell different kinds of wood items like a rectangular box, cylindrical pen stand, and cuboidal pen stand. One day a student came to his shop and asked him to make a pen stand with the dimensions as follows:

A pen stand should be in the shape of a cuboid with four conical depressions to hold pens. The dimensions of the cuboid should be 15 cm by 10 cm by 3.5 cm. The radius of each of the depressions is0.5 cm and the depth is1.4 cm.



a) The volume of the cuboidal part. (1)
b) The volume of wood in the entire stand. (1)
c) Total volume of conical depression. (2)

OR

If the cost of wood used is ₹ 10 per cm^3 , then the total cost of making the pen stand. (2)

Surface Area and Volume Paper Details – Analysis		
Objective Questions		
MCQ	1 marks x 8 question = 8	
Assertion Reason	1 marks x 2 question = 2	
Subjective		
Short type I	2 marks x 5 question = 10	
Short type II	3 marks x 4 question = 12	
Long Type	5 marks x 2 question = 10	
Case Studies Based		
Case 1	4 marks	
Case 2	4 marks	

Total = 50 marks Your Score =