

Time : 1 Hour 30 Minute

STD 10 Maths
Chapter Based Test

Total Marks : 50

Section A

* Choose the right answer from the given options. [1 Marks Each] [7]

1. If four times the sum of the areas of two circular faces of a cylinder of height 8cm is equal to twice the curve surface area, then diameter of the cylinder is:
(A) 4cm (B) 8cm (C) 2cm (D) 6cm
2. A circus tent is cylindrical to a height of 4m and conical above it. If its diameter is 105m and its slant height is 40m, the total area of the canvas required in m^2 is:
(A) 1760 (B) 2640 (C) 3960 (D) 7920
3. The volume of a cube is $2744cm^3$. Its surface area is:
(A) $196cm^2$ (B) $1176cm^2$ (C) $784cm^2$ (D) $588cm^2$
4. A cubical block of side 7cm is surmounted by a hemisphere. The greatest diameter of the hemisphere is:
(A) 14cm (B) 10.5cm (C) 3.5cm (D) 7cm
5. Choose the correct answer from the given four options:
A solid piece of iron in the form of a cuboid of dimensions $49cm \times 33cm \times 24cm$, is moulded to form a solid sphere. The radius of the sphere is:
(A) 21cm (B) 23cm (C) 25cm (D) 19cm
6. How many bricks, each measuring $(25cm \times 11.25cm \times 6cm)$, will be required to construct a wall $(8m \times 6m \times 22.5cm)$?
(A) 8000 (B) 6400 (C) 4800 (D) 7200
7. The ratio of lateral surface area to the total surface area of a cylinder with base diameter 1.6m and height 20cm is:
a. 1 : 7
b. 1 : 5
c. 7 : 1
d. 8 : 1

* A statement of Assertion (A) is followed by a statement of Reason (R). [3]

Choose the correct option.

8. **Directions:** In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:
Assertion: The volume of a hall, which is 5 times as high as it is broad and 8 times as long as it is high, is $12.8m^3$. The breadth of the hall is 25cm.
Reason: The total surface area of a cuboid of length (l), breadth (b) and height (h) is $2[lb + bh + lh]$

- Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
- Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
- Assertion (A) is true but reason (R) is false.
- Assertion (A) is false but reason (R) is true.

9. **Directions:** In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

Assertion: From a solid cylinder, whose height is 12cm and diameter 10cm a conical cavity of same height and same diameter is hollowed out. Then, volume of the cone is $\frac{2200}{7} \text{ cm}^3$

Reason: If a conical cavity of same height and same diameter is hollowed out from a cylinder of height h and base radius r, then volume of the cone will be half of the volume of the cylinder.

- Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
- Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
- Assertion (A) is true but reason (R) is false.
- Assertion (A) is false but reason (R) is true.

10. **Directions:** In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

Assertion: The number of coins 1.75cm in diameter and 2mm thick is formed from a melted cuboid $10\text{cm} \times 5.5\text{cm} \times 3.5\text{cm}$ is 400.

Reason: Volume of a cylinder $= \pi r^2$ cubic units and area of cuboid $= (l \times b \times h)$ cubic units.

- Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
- Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
- Assertion (A) is true but reason (R) is false.
- Assertion (A) is false but reason (R) is true.

* **State whether the following sentences are True or False. [1 Marks Each] [2]**

11. Write 'True' or 'False' and justify your answer in the following:

A solid cylinder of radius r and height h is placed over other cylinder of same height and radius. The total surface area of the shape so formed is $4\pi r h + 4\pi r^2$.

12. Write 'True' or 'False' and justify your answer in the following:

The volume of the frustum of a cone is $\frac{1}{3} \pi h [r_2^2 + r_1^2 + r_1 r_2]$, where h is vertical height of the frustum and r_1, r_2 are the radii of the ends.

* **Answer the following questions in one sentence. [1 Marks Each] [2]**

13. What is the arithmetic mean of first n natural numbers?

14. The radii of the top and bottom of a bucket of slant height 45cm are 28cm and 7cm, respectively. Find the curved surface area of the bucket.

Section B

* Given section consists of questions of 2 marks each.

[10]

1. Find the depth of a cylindrical tank of radius 28m, if its capacity is equal to that of a rectangular tank of size 28m × 16m × 11m.
2. The radii of the ends of a bucket of height 24cm are 15cm and 5cm. Find its capacity. (Take $\pi = \frac{22}{7}$)
3. The volume of a right circular cylinder with its height equal to the radius is $25\frac{1}{7}\text{cm}^3$ Find the height of the cylinder.
4. Two cubes, each of volume 64cm^3 , are joined end to end. Find the total surface area of the resulting cuboid.
5. A hemispherical bowl of internal diameter 30cm is full of a liquid. This liquid is poured into cylindrical bottles of diameter 5cm and height 6cm each. How many bottles are required?

Section C

* Given section consists of questions of 3 marks each.

[12]

1. A brooch is made with silver wire in the form of a circle with diameter 35 mm. The wire is also used in making 5 diameters which divide the circle into 10 equal sectors as shown in figure. Find:
 - i. the total length of the silver wire required.
 - ii. the area of each sector of the brooch.



2. Find the weight of a hollow sphere of metal having internal and external diameters as 20cm and 22cm, respectively if 1m^3 of metal weighs 21g.
3. A container open at the top, is in the form of a frustum of a cone of height 24cm with radii of its lower and upper circular ends as 8cm and 20cm respectively. Find the cost of milk which can completely fill the container at the rate of Rs. 21 per litre.
4. A spherical cannon ball 28cm in diameter is melted and recast into a right circular conical mould, base of which is 35cm in diameter. Find the height of the cone.

Section D

* Given section consists of questions of 5 marks each.

[10]

1. In the middle of a rectangular field measuring 30m × 20m, a well of 7m diameter and 10m depth is dug. The earth so removed is evenly spread over the remaining part of the field. Find the height through which the level of the field is raised.
2. A milk container is made of metal sheet in the shape of frustum of cone whose volume is 10459cm^3 . The radii of its lower and upper circular ends are 8cm and 20cm

respectively. Find the cost of metal sheet used in making the container at the rate of Rs. 1.40 per cm^2 . (use $\pi = \frac{22}{7}$)

Section E

*** Case study based questions**

[4]

1. To make the learning process more interesting, creative and innovative, Amayras' class teacher brings clay in the classroom, to teach the topic-Surface Areas and Volumes. With clay, she forms a cylinder of radius 6cm and height 8cm. Then she moulds the cylinder into a sphere and asks some questions to students.



- i. During the conversion of a solid from one shape to another the volume of new shape will be Increase, Decrease or Remain unaltered?
- ii. The radius of the sphere so formed is:
- iii. The volume of the sphere so formed is:
Or
Find the ratio of the volume of sphere to the volume of cylinder.

