

SATISH SCIENCE ACADEMY

**DHANORI PUNE-411015** 

# SURFACE AREAS AND VOLUMES

# **Class 10 - Mathematics**

# Time Allowed: 3 hours

### Maximum Marks: 194

- 1. A cylindrical tub of radius 5 cm and height 9.8 cm is full of water. A solid in the form of a right circular cone [1] mounted on a hemisphere is immersed into the tub. If the radius of the hemisphere is 3.5 cm and the height of the cone outside the hemisphere is 5 cm, then find the volume of water left in the tub. (Take  $\pi = \frac{22}{7}$ )
  - a) 716 cm<sup>3</sup> b) 616 cm<sup>3</sup>
  - c) <sub>600 cm<sup>3</sup></sub> d) <sub>535 cm<sup>2</sup></sub>
- If a cone is cut into two parts by a horizontal plane passing through the mid-point of its axis, the ratio of the volumes of the upper part and the cone is

b) 1:4

d) 1 : 8

b)  $4\pi \, cm$ 

d)  $3\pi cm^{3}$ 

- a) 1:2
- c) 1 : 6
- A solid is in the shape of a cone standing on a hemisphere with both their radii being equal to 1cm and the height [1] of the cone is equal to its radius. The volume of the solid is
  - a)  $\pi \, cm^3$
  - c)  $2\pi cm^3$
- If a marble of radius 2.1 cm is put into a cylindrical cup full of water of radius 5cm and height 6 cm, then how [1] much water flows out of the cylindrical cup?
  - a) 38.8 cm<sup>3</sup> c) 19.4 cm<sup>3</sup> d) 55.4 cm<sup>3</sup>
- 5. A sphere of diameter 18 cm is dropped into a cylindrical vessel of diameter 36 cm, partly filled with water. If the **[1]** sphere is completely submerged then the water level rises by
  - a) 4 cm b) 5 cm
  - c) 3 cm d) 6 cm
- 6. A hollow cube of internal edge 22 cm is filled with spherical marbles of diameter 0.5 cm and  $\frac{1}{8}$  space of the **[1]** cube remains unfilled. Number of marbles required is
  - a) 142296 b) 142596
  - c) 142496 d) 142396
- 7. A solid spherical ball fits exactly inside the cubical box of side 2a. The volume of the ball is [1]
  - a)  $\frac{1}{6}\pi a^3$  b)  $\frac{4}{3}\pi a^3$ c)  $\frac{16}{3}\pi a^3$  d)  $\frac{32}{3}\pi a^3$

8. The maximum volume of a cone that can be carved out of a solid hemisphere of radius 'r' is

- a)  $\pi r^3$  b)  $\frac{2}{3}\pi r^3$
- c)  $\frac{1}{3}\pi r^3$  d)  $\frac{1}{3}\pi r^2 h$
- 9. A solid sphere is cut into two hemispheres. The ratio of the surface areas of sphere to that of two hemispheres [1] taken together, is:
  - a) 3 : 2 b) 1 : 1 c) 2 : 3 d) 1 : 4

10. The height of a cone is 30 cm. A small cone is cut off at the top by a plane parallel to the base. If its volume be  $\begin{bmatrix} 1 \\ \frac{1}{27} \end{bmatrix}$  of the volume of the given cone, then the height above the base at which the section has been made, is

- a) 15 cm b) 10 cm
- c) 25 cm d) 20 cm
- 11. A sphere of diameter 6 cm is dropped in a right circular cylindrical vessel partly filled with water. The diameter [2] of the cylindrical vessel is 12 cm. If the sphere is completely submerged in water, by how much will the level of water rise in the cylindrical vessel?
- 12. Find the volume of the largest right circular cone that can be cut out of a cube whose edge is 9 cm. [2]
- 13. From a solid cylinder whose height is 2.4 cm and diameter 1.4 cm, a conical cavity of the same height and same [2] diameter is hollowed out. Find the volume of the remaining solid to the nearest cm<sup>3</sup>. Use  $\pi = \frac{22}{7}$
- 14. If a sphere is inscribed in a cube, find the ratio of the volume of cube to the volume of the sphere.
- 15. Three cubes whose edges measure 3 cm, 4 cm and 5 cm respectively to form a single cube. Find its edge. Also, [2] find the surface area of the new cube.
- 16. The radius and height of a solid right-circular cone are in the ratio of 5 : 12. If its volume is 314 cm<sup>3</sup>, find its total surface area. [Take  $\pi$  = 3,14.]
- 17. A spherical glass vessel has a cylindrical neck 8 cm long, 2 cm in diameter the diameter of the spherical part is [2] 8.5 cm. By measuring the amount of water it holds, a child finds its volume to be 345 cm<sup>3</sup>. Check whether she is correct, taking the above as the inside measurements and  $\pi$  = 3.14.
- 18. A wooden article was made by scooping out a hemisphere from each end of a cylinder, as shown in the figure. If [2] the height of the cylinder is 20 cm and its base is of diameter 7 cm, find the total surface area of the article when it is ready.



- 19. The difference between outside and inside surface areas of cylindrical metallic pipe 14 cm long is 44 m<sup>2</sup>. If the [2] pipe is made of 99 cm<sup>3</sup> of metal, find the outer and inner radii of the pipe.
- 20. 25 circular plates, each of radius 10.5 cm and thickness 1.6 cm, are placed one above the other to form a solid [2] circular cylinder. Find the curved surface area and the volume of the cylinder so formed.
- 21. Find the maximum volume of a cone that can be curved out of a solid hemisphere of radius r. [2]
- 22. 50 circular plates each of diameter 14 cm and thickness 0.5 cm are placed one above the other to form a right [2]

[1]

[2]

circular cylinder. Find its total surface area.

23. In Figure, find the area of the shaded region where a circular arc of radius 7 cm has been drawn with vertex O of **[2]** an equilateral triangle OAB of side 14 cm as centre. (Use  $\pi = \frac{22}{7}$  and  $\sqrt{3} = 1.73$ )



- 24. The inner and outer radii of a hollow cylinder surmounted on a hollow hemisphere of same radii are 3 cm and 4 [2] cm respectively. If height of the cylinder is 14 cm, then find its total surface area (inner and outer).
- 25. From a solid cube of side 7 cm, a conical cavity of height 7 cm and radius 3 cm is hollowed out. Find the [2] volume of the remaining solid.
- 26. From a rectangular block of wood, having dimensions 15 cm × 10 cm × 3.5 cm, a pen stand is made by making [3] four conical depressions. The radius of each one of the depression is 0.5 cm and the depth 2.1 cm. Find the volume of wood left in the pen stand.
- 27. Marbles of diameter 1.4 cm are dropped into a cylindrical beaker of diameter 7 cm containing some water. Find [3] the number of marbles that should be dropped into the beaker so that the water level rises by 5.6 cm.
- 28. A sphere and a cube have equal surface areas. What is the ratio of the volume of the sphere to that of the cube? [3]
- 29. Sushant has a vessel, of the form of an inverted cone, open at the top, of height 11 cm and radius of top as 2.5 [3] cm and is full of water. Metallic spherical balls each of diameter 0.5 cm are put in the vessel due to which  $\left(\frac{2}{5}\right)^{th}$  of the water in the vessel flows out. Find how many balls were put in the vessel. Sushant made the arrangement so that the water that flows out irrigates the flower beds. What value has been shown by Sushant?
- 30. A container like a right circular having diameter 12cm and height 15cm is full of ice-cream. The ice-cream is to [3] be filled in cones of height 12cm and diameter 6cm having a hemispherical shape on the top. Find number of such cones which can be filled with ice-cream.
- 31. A wall 24 m long, 0.4 m thick and 6 m high is constructed with the bricks each of dimensions 25 cm  $\times$  16 cm  $\times$  [3] 10 cm. If the mortar occupies  $\frac{1}{10}$  th of the volume of the wall, then find the number of bricks used in constructing the wall.
- 32. A medicine capsule is in the shape of a cylinder with two hemispheres stuck to each of its ends (see figure). The **[3]** length of the entire capsule is 14 mm and the diameter of the capsule is 5 mm. Find its surface area.



- 33. A tent of height 77 dm is in the form a right circular cylinder of diameter 36 m and height 44 dm surmounted by [3] a right circular cone. Find the cost of the canvas at Rs 3.50 per m<sup>2</sup>.
- 34. A spherical glass vessel has a cylindrical neck 7 cm long and 4 cm in diameter. The diameter of the spherical [3] part is 21 cm. Find the quantity of water it can hold. [Use  $\pi = 22/7$ ]
- 35. Two solid spheres made of the same metal have weights 5920 g and 740 g, respectively. Determine the radius of **[3]** the larger sphere, if the diameter of the smaller one is 5 cm.
- 36. A cylindrical tub of radius 12 cm contains water to a depth of 20 cm. A spherical ball is dropped into the tub and **[5]** the level of the water is raised by 6.75 cm. Find the radius of the ball.

- 37. A solid wooden toy is in the shape of a right circular cone mounted on a hemisphere. If the radius of the hemisphere is 4.2 cm and the total height of the toy is 10.2 cm, find the volume of that wooden toy.
- 38. A solid is composed of a cylinder with hemispherical ends. If the whole length of the solid is 104 cm and the [5] radius of each of the hemispherical ends is 7 cm, find the cost of polishing its surface at the rate of ₹10 per dm<sup>2</sup>.
- 39. The boilers are used in thermal power plants to store water and then used to produce steam. One such boiler [5] consists of a cylindrical part in middle and two hemispherical parts at its both ends. Length of the cylindrical part is 7m and radius of cylindrical part is  $\frac{7}{2}$  m.

Find the total surface area and the volume of the boiler. Also, find the ratio of the volume of cylindrical part to the volume of one hemispherical part.



- 40. A toy is in the form of a cone mounted on a hemisphere. The diameter of the base of the cone is 7 cm and its [5] height is 15.5 cm. Find the volume of the toy. (Use  $\pi$  = 3.14).
- 41. An iron pillar has some part in the form of a right circular cylinder and remaining in the form of a right circular [5] cone. The radius of base of each of cone and cylinder is 8 cm. The cylindrical part is 240 cm high and the conical part is 36 cm high. Find the weight of the pillar, if one cubic cm of iron weighs 10 g.
- 42. A solid is in the shape of a cone standing on a hemisphere with both their diameters being equal to 1 cm and the [5] height of the cone is equal to its radius. Find the volume of the solid. [Use  $\pi$  = 3.14]
- 43. A well, whose diameter is 7m, has been dug 22.5 m deep and the earth dugout is used to form an embankment [5] around it. If the height of the embankment is 1.5 m, find the width of the embankment.
- 44. From a solid cylinder of height 20 cm and diameter 12 cm, a conical cavity of height 8 cm and radius 6 cm is [5] hallowed out. Find the total surface area of the remaining solid.
- 45. Rasheed got a playing top (lattu) as his birthday present, which surprisingly had no colour on it. He wanted to **[5]** colour it with his crayons. The top is shaped like a cone surmounted by a hemisphere. The entire top is 5 cm in height and the diameter of the top is 3.5 cm. Find the area he has to colour. (Take  $\pi = \frac{22}{7}$ ).



### 46. **Read the following text carefully and answer the questions that follow:**

One day Vinod was going home from school, saw a carpenter working on wood. He found that he is carving out

[4]

[5]

a cone of same height and same diameter from a cylinder. The height of the cylinder is 24 cm and base radius is 7 cm. While watching this, some questions came into Vinod's mind.



i. Find the slant height of the conical cavity so formed? (1)

- ii. Find the curved surface area of the conical cavity so formed? (1)
- iii. Find the external curved surface area of the cylinder? (2)

# OR

Find the ratio of curved surface area of cone to curved surface area of cylinder? (2)

47. A godown building is in the form as shown in Fig. The vertical crosssection parallel to the width side of the **[4]** building is a rectangle  $7m \times 3m$ , mounted by a semicircle of radius 3.5 m. The inner measurements of the cuboidal portion of the building are  $10m \times 7m \times 3m$ .



i. Find the volume of the godown. (Take  $\pi$  = 22/7)

- ii. Find the total interior surface area excluding the floor (base).
- 48. A carpenter used to make different kinds and different shapes of a toy of wooden material. One day a man came [4] to his shop to purchase an article that has values as per his requirement. He instructed the carpenter to make the toy by taking a wooden block of rectangular shape with height 12 cm and width 9 cm, then shaping this block as a solid cylinder and then scooping out a hemisphere from each end, as shown in the given figure. The difference between the length of rectangle and height of the cylinder is 2 cm (Rectangle length > Cylinder height), and the difference between the breadth of rectangle and the base of cylinder is also 2 cm (Rectangle breadth > Cylinder base(diameter)).



By using the above information, answer the following question:

i. Find the volume of the cylindrical block before the carpenter started scooping the hemisphere from it.

ii. Find the total surface area of the article.

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

Shanta runs an industry in a shed which was in the shape of a cuboid surmounted by half cylinder. The dimensions of the base were  $15 \text{ m} \times 7 \text{ m} \times 8 \text{ m}$ .

The diameter of the half cylinder was 7 m and length was 15 m.



- i. Find the volume of the air that the shed can hold. (1)
- ii. If the industry requires machinery which would occupy a total space of 300 m<sup>3</sup> and there are 20 workers each of whom would occupy 0.08 m<sup>3</sup> space on an average, how much air would be in the shed when it is working? (1)
- iii. Find the surface area of the cuboidal part. (2)

## OR

50.

Find the surface area of the cylindrical part. (2)

# Read the following text carefully and answer the questions that follow:

Singing bowls (hemispherical in shape) are commonly used in sound healing practices. Mallet (cylindrical in shape) is used to strike the bowl in a sequence to produce sound and vibration.



One such bowl is shown here whose dimensions are:

Hemispherical bowl has outer radius 6 cm and inner radius 5 cm.

Mallet has height of 10 cm and radius 2 cm.

- i. What is the volume of the material used in making the mallet? (1)
- ii. The bowl is to be polished from inside. Find the inner surface area of the bowl. (1)
- iii. Find the volume of metal used to make the bowl. (2)

# OR

Find total surface area of the mallet. (Use  $\pi$  = 3.14) (2)

# 51. **Read the following text carefully and answer the questions that follow:**

Mayank a student of class 7<sup>th</sup> loves watching and playing with birds of different kinds. One day he had an idea in his mind to make a bird-bath on his garden. His brother who is studying in class 10<sup>th</sup> helped him to choose the material and shape of the birdbath. They made it in the shape of a cylinder with a hemispherical depression at one end as shown in the Figure below. They opted for the height of the hollow cylinder as 1.45 m and its radius

is 30 cm. The cost of material used for making bird bath is ₹40 per square meter.



i. Find the curved surface area of the hemisphere. (1)

- ii. Find the total surface area of the bird-bath. (Take  $\pi = \frac{22}{7}$ ) (1)
- iii. What is total cost for making the bird bath? (2)

# OR

Mayank and his brother thought of increasing the radius of hemisphere to 35 cm with same material so that birds get more space, then what is the new height of cylinder? (2)

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

A carpenter used to make different kinds and different shapes of a toy of wooden material. One day a man came to his shop to purchase an article that has values as per his requirement. He instructed the carpenter to make the toy by taking a wooden block of rectangular shape with height 12 cm and width 9 cm, then shaping this block as a solid cylinder and then scooping out a hemisphere from each end, as shown in the given figure. The difference between the length of rectangle and height of the cylinder is 2 cm (Rectangle length > Cylinder height), and the difference between the breadth of rectangle and the base of cylinder is also 2 cm (Rectangle breadth > Cylinder base(diameter)).



- i. Find the volume of the cylindrical block before the carpenter started scooping the hemisphere from it. (1)
- ii. Find the volume of wood scooped out? (1)
- iii. Find the total surface area of the article? (2)

# OR

Find the total surface area of cylinder before scooping out hemisphere? (2)

# 53. **Read the following text carefully and answer the questions that follow:**

Rohan makes a project on coronavirus in science for an exhibition in his school. In this Project, he picks a

sphere which has volume 38808 cm<sup>3</sup> and 11 cylindrical shapes each of Volume 1540 cm<sup>3</sup> with 10 cm length.



- i. Find the area covered by cylindrical shapes on the surface of a sphere. (1)
- ii. Find the diameter of the sphere. (1)

[4]

iii. Find the total volume of the shape. (2)

#### OR

Find the curved surface area of the cylindrical shape. (2)

#### 54. **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 is 0.5 cm and the depth is 1.4 cm.



i. The volume of the cuboidal part. (1)

ii. The volume of wood in the entire stand. (1)

iii. Total volume of conical depression. (2)

### OR

If the cost of wood used is  $\gtrless 10$  per cm<sup>3</sup>, then the total cost of making the pen stand. (2)

55. Mayank a student of class 7<sup>th</sup> loves watching and playing with birds of different kinds. One day he had an idea [4] in his mind to make a bird-bath on his garden. His brother who is studying in class 10<sup>th</sup> helped him to choose the material and shape of the birdbath. They made it in the shape of a cylinder with a hemispherical depression at one end as shown in the Figure below. They opted for the height of the hollow cylinder as 1.45 m and its radius is 30 cm.



By using the above-given information, find the following:

- i. The curved surface area of the hemisphere.
- ii. The total surface area of the bird-bath. (Take  $\pi$  = 22/7)
- 56. A carpenter in the small town of Bareilly used to make and sell different kinds of wood items like a rectangular [4] 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 is 0.5 cm and the depth is 1.4 cm.



By using the above-given information, find the following:

i. The volume of the cuboid.

ii. The volume of wood in the entire stand.

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

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. (2)

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

Governing council of a local public development authority of Dehradun decided to build an adventurous playground on the top of a hill, which will have adequate space for parking.



After survey, it was decided to build rectangular playground, with a semi-circular area allotted for parking at one end of the playground. The length and breadth of the rectangular playground are 14 units and 7 units, respectively. There are two quadrants of radius 2 units on one side for special seats.

- i. What is the total perimeter of the parking area? (1)
- ii. What is the total area of parking and the two quadrants? (1)

[4]

iii. What is the ratio of area of playground to the area of parking area? (2)

### OR

Find the cost of fencing the playground and parking area at the rate of  $\mathbf{E}$  2 per unit. (2)

59. A juice seller was serving his customers using glasses as shown in Figure. The inner diameter of the cylindrical [4] glass was 5 cm, but the 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 capacity of the glass and its actual capacity. (Use  $\pi$  = 3.14)



60. Assertion (A): Two identical solid cubes of side 5 cm are joined end to end. The total surface area of the [1] resulting cuboid is 350 cm<sup>2</sup>.

**Reason (R):** Total surface area of a cuboid is 2(lb + bh + hl)

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

c) A is true but R is false.

Assertion (A): If we join two hemispheres of same radius along their bases, then we get a sphere. [1] 61. **Reason (R):** A tank is made of the shape of a cylinder with a hemispherical depression at one end. The height of the cylinder is 1.45 m and radius is 30 cm. The total surface area of the tank is  $3.3 \text{ m}^2$ .

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

c) A is true but R is false. d) A is false but R is true.

Assertion (A): A spherical glass vessel has a cylindrical neck 8 cm long, 2 cm in diameter; the diameter of the 62. [1] spherical part is 8.5 cm. By measuring the amount of water is holds, a child finds its volume to be 345 cm<sup>3</sup>.

**Reason (R):** To calculate the volume of vessel the expression used here is  $v = \pi r^2 h + \frac{4}{3}\pi r^3$ .

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

c) A is true but R is false. d) A is false but R is true.

63. Assrtion (A): A toy is in the form of a cone mounted on a hemisphere with the same radius. The radius of the [1] conical portion is 4 cm and its height is 3 cm. the surface area of the toy is 163.28 cm<sup>2</sup>. [Take  $\pi$  = 3.14] **Reason (R):** Volume of hemisphere is  $\frac{2}{3}\pi r^2$ 

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

c) A is true but R is false. d) A is false but R is true.

**Assertion (A):** In the given figure, a sphere is inscribed in a cylinder. The surface area of the sphere is not equal 64. [1] to the curved surface area of the cylinder.



**Reason (R):** Surface area of sphere is  $4\pi r^2$ 

- a) Both A and R are true and R is the correctb) Both A and R are true but R is not the<br/>correct explanation of A.
- c) A is true but R is false. d) A is false but R is true.

65. **Assertion (A):** In a solid hemisphere of radius 10 cm, a right cone of same radius is removed out. The volume of **[1]** the remaining solid is 523.33 cm<sup>3</sup> [Take  $\pi$  = 3.14 and  $\sqrt{2}$  = 1.4]

**Reason (R):** Expression used here to calculate volume of remaining solid = Volume of hemisphere - Volume of cone

- a) Both A and R are true and R is the correctb) Both A and R are true but R is not the<br/>correct explanation of A.explanation of A.correct explanation of A.
- c) A is true but R is false. d) A is false but R is true.
- 66. 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<sup>2</sup>.

Reason (R): Total surface area of a cuboid is 2(lb + bh + lh)

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.

67. Assertion (A): The given figure represents a hemisphere surmounted by a conical block of wood. The diameter [1] of their bases is 6 cm each and the slant height of the cone is 5 cm. The volume of the solid is 196 cm<sup>3</sup>



**Reason (R):** The volume hemisphere is given by  $\frac{2}{3}\pi r^3$ 

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.
- 68. Assertion (A): In the given figure, a sphere circumscribes a right cylinder whose height is 8 cm and radius of [1] the base is 3 cm. The ratio of the volumes of the sphere and the cylinder is 125 : 54



**Reason (R):** Ratio of their volume =  $\frac{Volume \ of \ sphere}{Volume \ of \ cylinder}$ 

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.

69. Assertion (A): A sphere of radius 7 cm is m ounted on the solid cone of radius 6 cm and height 8 cm. the [1] volume of the combined solid is 1737.47 cm<sup>3</sup>. [Take  $\pi$  = 3.14]



<b>Reason (R):</b> Volume of sphere and surface area of	cone is given by $\frac{4}{3}\pi r^3$ and $\frac{1}{3}\pi r^2 h$ respectively.
a) Both A and R are true and R is the correct	b) Both A and R are true but R is not the
explanation of A.	correct explanation of A.

c) A is true but R is false. d) A is false but R is true.

70. Assertion (A): A sphere of radius 7 cm is mounted on the solid cone of radius 6 cm and height 8 cm. The [1] volume of the combined solid is 1737.97 cm<sup>3</sup>.

**Reason (R):** Volume of sphere is  $\frac{4}{3}\pi r^3$ .

- b) Both A and R are true but R is not the a) Both A and R are true and R is the correct correct explanation of A. explanation of A. d) A is false but R is true.
- c) A is true but R is false.
- 71. Assertion (A): Two identical solid cubes of side a are joined end to end. Then the total surface area of the [1] resulting cuboid is  $10 a^2$ .

**Reason (R):** The total surface area of a cube having side  $a = 6 a^2$ .

- a) Both A and R are true and R is the correct b) Both A and R are true but R is not the correct explanation of A. explanation of A.
- c) A is true but R is false.
- Assertion (A): In the given figure, a sphere circumscribes a right cylinder whose height is 8 cm and radius of 72. [1] the base is 3 cm. The ratio of the surface area of the sphere and the cylinder is 6 : 11

d) A is false but R is true.



Surface area of sphere
Surface area of cylinder **Reason (R):** Ratio of their surface area =

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.
- 73. Assertion (A): In a solid hemisphere of radius 10 cm, a right cone of same radius is removed out. The surface [1] area of the remaining solid is 570.74 cm<sup>2</sup> [Take  $\pi$  = 3.14 and  $\sqrt{2}$  = 1.4]

Reason (R): **Reason (R)**: Expression used here to calculate Surface area of remaining solid = Curved surface area of hemisphere + Curved surface area of cone

- 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.
- 74. A solid sphere of diameter 6 cm is dropped in a right circular cylindrical vessel partly filled with water. The [2]
   diameter of the cylindrical vessel is 12 cm. If the sphere is completely submerged into water, how much will the level of water rise in the cylindrical vessel? (In cm)
- 75. A cylindrical tub of radius 16 cm contains water to a depth of 30 cm. A spherical iron ball is dropped into the [2] tub and thus level of water is raised by 9 cm. What is the radius(cm) of the ball?