MATHS

BOOKS - RS AGGARWAL MATHS (HINGLISH)

VOLUME AND SURFACE AREAS OF SOLIDS

Solved Examples

1. Three cubes each of the volume $216cm^3$ are joined end to end to from a cuboid .Find total surface area of the resulting cuboid.

    A. 504 sq.cm

    B. 604 sq. cm

    C. 704 sq. cm

    D. 804 sq. cm

Answer: A

2. A sphere and a cube has same surface area. Then the ratio of the volume of sphere to cube is

A. $\sqrt{6} : \sqrt{\pi}$

B. $\sqrt{7} : \sqrt{\pi}$

C. $\sqrt{8} : \sqrt{\pi}$

D. $\sqrt{5} : \sqrt{\pi}$

Answer: A

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3. Avessel is in the form of a hemispherical bowl mounded by a hollow cylinder .The diameter of the hemisphere is 14 cm and the total height of the vessel is 13 cm .Find the capacity of the vessel.

A. 1842.67 cm^3

B. 1677.67 cm^3

C. 1732.67 cm^3

D. 1642.67 cm^3

Answer: D

4. Due to sudden floods, some welfare associations jointly requested the government to get 100 tents fixed immediately and offered to contribute 50% of the cost, If the lower part of each tent is of the form of a cylinder of diameter 4.2 m and height 4 m with the conical upper part of same diameter but of height 2.8 m, and the canvas to be used costs 100 per sq. m, find the amount the

associations will have to pay. What values are shown by these associations [Use $\pi = \dfrac{22}{7}$]

5. A cylindrical tub if radius 5cm and length 9.8cm is full of water .A solid in the form of a right circular cone mounted on a hemisphere is immersed into the tub.If the radius of the hemisphere is 3.5cm and the total height of the solid ids 8.5cm ,find the volume of water left in the tube

6. A solid wooden toy is in the form of a hemisphere surmounted by a cone of same radius. The radius of hemisphere is 3.5 cm and the total wood used in the making of toy is $166\dfrac{5}{6}cm^3$. Find the height of the toy. Also, find the cost of painting the hemispherical part of the toy at the rate of Rs. 10 per cm^2

7. A solid is in the shape of a cone mounted on a hemisphere of same base readius. If the curved surface areas of the hemisphere part and the conical part are equal then find the ratio of the radius and the height of the conical part.

   A. $1:3$

   B. $1:\sqrt{3}$

   C. $1:2$

   D. none of these

Answer: B

8. A solid cylinder of diameter 12 cm and height 15 cm is melted and recast into 12 toys in the shape of a right circular cone mounted on a hemisphere.Find the radius of the hemisphere and total height of the toy.if the height of the cone is 3 time the radius .

9. An iron pillar has some part in the from of right circular cylinder and the remaining in the from of a right circular cone .The radius of the base of each of the cone and the cylinder is 8 cm . The cylindrical part is 240 cm hight and the conical part is 36 cm hight .Find the weight of the pillar if 1 cubic centimetre of iron weighs 7.5 g .

   A. 480. 16 kg

   B. 380. 16kg

   C. 580. 16 kg

D. 680. 16 kg

Answer: B

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10. A solid is composed of a cylinder with hemispherical ends.If the whole length of the solid is 104 cm and the readius of each of its hemispherical ends is 7 cm , find the cost of polishing its surface at the rate of ₹ 10 per dm^2

11. 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 length 5 cm and diameter 2.8 cm

12. Rahul an engieering student, prepared a model shaped like a cylinder with two cones attached at its ens. The diameter of the model is 3 cm and its length is 12 cm .If each conical part has a model (assume the oute and inner dimensions of the model to be nearly the same),(ii) cost of painting the outer surface of the model at ₹ 12. 50 per cm^2

13. A spherical glass vessel has a cylindrical neck 8 cm long, 2 cm in diameter; the diameter of the spherical part is 8.5 cm. By measuring the amount of water it holds, a child finds its volume to be $345\ cm^3$. Check whether she is correct, takin

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14. A solid toy is in the form of a right circular cylinder with a hemispherical shape at one

end and a cone at the other end. Their common diameter is 4.2 cm. and the height of the cylindrical and conical portions are 12 cm and 7 cm respectively. Find the volume of the solid toy. (Use $\pi = 22/7$)

15. The largest possible sphere, is carved out form a solid woodern cube of side 7 cm.Find

(i) the volume of the sphere,

(ii) the percentage of wood wosted in the process.

16. From a solid circular cylinder with height 12 cm and radius of the base 5 cm, a right circular cone of the same height and the same base radius is removed find the volume and total surface area of the remaing solid . [User $\pi = 3.14$]

17. A hemispherical depression is cut out from one face of a cubical block of side 7cm, such that the diameter of the hemisphere is equal to the edge of the cube. Find the surface area of the remaining solid.

A. $422cm^2$

B. $322cm^2$

C. $326cm^2$

D. $328cm^2$

Answer: B

18. A woodern article was made by scooping out a hemisphere from each end of a soid cylinder is 12 cm and its base is of radius 4.2 cm find the total suface area of the article. Also find the volume of the wood left in the article.

19. In the given figure from a cuboidal solid metallic block of dimensions $15cm \times 10cm \times 5cm$ a cylindrical hole of diamter 7 cm is drilled out . Find the suface area of the remaining block .
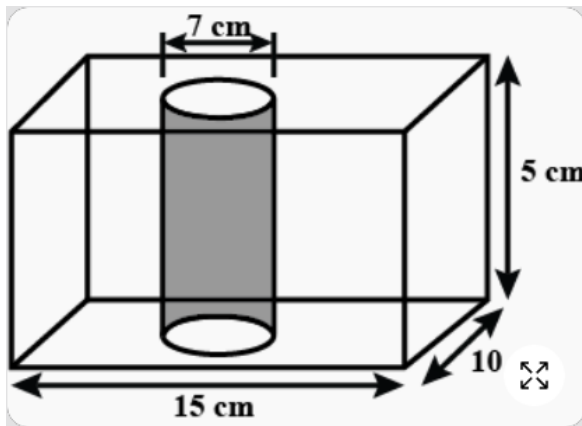
A. $450cm^2$

B. $553cm^2$

C. $550cm^2$

D. $583cm^2$

Answer: D

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20. A wooden toy rocket is in the shape of a cone mounted on a cylinder. The height of the entire rocket is 26 cm, while the height of the conical part is 6 cm. The base of the conical

portion has a diameter of 5 cm, while the base diameter of the cy

21. Shanta runs an industry in a shed which is in the shape of a cuboid surmounted by a half cylinder. If the base of the shed is of dimension $7m\ \times\ 15m$, and the height of the cuboidal portion is 8 m, find the volume of air that the shed

22. The decorative block is made of two solids a cube and a hemisphere. The base of the block is a cube with edge 5 cm, and the hemisphere fixed on the top has a diameter of 4.2 cm. Find the total surface area of the block.

23. A solid toy is in the form of a hemisphere surmounted by a right circular cone. Height of the cone is 2 cm and the diameter of the base

is 4 cm. If a right circular cylinder circumscribes the toy, find how much more space it will cover.

24. The dimensions of a metallic cuboid are: $100 \ cm \times 80 \times 64 \ cm$. It is melted and recast into a cube. Find the surface area of the cube.

A. $58400 cm^2$

B. $38400 cm^2$

C. $39400 cm^2$

D. $36400 cm^2$

Answer: B

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25. How many spherical bullets can be made out of a solid cube of lead whose edge measures 44 cm, each being 4 cm in diameter.

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26. How many silver coins, 1.75 cm in diameter and of thickness 2 mm, must be melted to form a cuboid of dimensions $5.5cm \times 10cm \times 3.5cm$?

27. A metallic sphere of radius 10.5 cm is melted and then recast into smaller cones, each of radius 3.5 cm and height 3 cm. How many cones are obtained ?

A. 136

B. 126

C. 146

D. 156

Answer: B

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28. The internal and external radii of a hollow sphere are 3 cm and 5 cm respectively. The sphere is melted to from a solid cylinder of

height $2\frac{2}{3} cm$. Find the diameter and the curved surface area of the cylinder.

29. A hollow sphere of internal and external diameters 4 cm and 8 cm is melted to form a cone of base diameter 8 cm. Find the height and the slant height of the cone.

30. A girl fills a cylindrical bucket 32 cm in height and 18 cm in radius with sand .She empties the bucket on the ground and makes a conical heap of the sand .If the height of the conical heap is 24 cm find (i) its radius (ii) its slant height.

31. 504 cones, each of diameter 3.5 cm height 3 cm, are melted and recast into a metallic

sphere. Find the diameter of the sphere and hence find its surface area.

32. Two spheres of same metal weight 1 kg and 7 kg. The radius of the smaller sphere is 3 cm. The two spheres are melted to form a single big sphere. Find the diameter of the new sphere.

33. The diameter of a copper shere is 6 cm. The sphere is melted and drawn into a long wire of niform circular cross section. If the length fo the wire is 36 m, find its thickness.

34. A solid cylinder of diamter 12 cm and height 15 cm is melted and recast into 12 toys in the shape of a right circular cone mounted on a hemisphere. Find the radius of the

hemisphere and the total height of the toy, if the height conical part is thrice its radius.

35. Find the number of coins, 1.5 cm in diameter and 0.2 cm thick, to be melted to form a right circular cylinder of height 10 cm and diameter 4.5 cm.

36. A solid iron rectangular block of dimensions 4.4m, 2.6m and 1m is cast into a hollow cylindrical pipe of internal radius 30cm and thickness 5cm. Find the length of the pipe.

37. A hemispherical bowl of radius 9 cm contains a liquid. This liquid is to be filled into cylindrical small bottles of diameter 3 cm and

height 4 cm. How many bottles will be needed

to empty the bowl ?

A. 44

B. 54

C. 34

D. 24

Answer: B

38. A hemispherical bowl of internal diameter 36 cm contains liquid. This liquid is filled into 72 cylindrical bottles of diameter 6 cm. Find the height of each bottle if 10% liquid is wasted in this transfer.

39. A conical vessel whose internal radius is 5 cm and height 24 cm, is full of water. The water is emptied into a cylindrical vessel with

internal radius 10 cm. Find the height to which the water rises in the cylindrical vessel.

40. A sphere of diameter 6 cm is fropped into a right circular cylindrical vessel, partly filled with water. The diameter of the cyulindrical vessel is 12 cm. If the sphere is completely cubmerged in water, by how much will the level of water rise in the cylindrical vessel ?

41. Sushant has a vessel of the form of an inverted cone, open at the top, of height 11 cm and radius of the top as 2.5 cm and is full of water. Metallic spherical balls each of diameter 0.5 cm are put in the vessel due to which two - fifths of the water in the vessel flows out Find how many balls were put in teh vessel. Sushant made the arrangement so that the water that flows out irrigates the flower beds. What value has been shown by Sushant ?

42. A vessel full of water is in the form of an inverted cone of height 8 cm and the radius of its top, which is open, is 5 cm. 100 spherical lean balls are droppend into the vessel. One-fourth of the water flows out of the vessel. Find the radius of a sphrical ball.

43. A housing society used to collect rain water from the foof of its building

$22m \times 20m$ to a cylindical vessel having diameter of base 2 m and height 3.5 m and them poump this water into the main water tank so that all members can use it. On a particular day the rain water collected from the roof just filled the cylindrical vessel. Then, find the rain water collected from the roof just filled the cylindrical vessel. Then, find the rainfall in centimetre.

44. Water flows through a circular pipe whose internal diameter is 2 cm, at the rate of 0.7 m per second into a cylindrical tank, the radius of whose base is 40 cm. By how much will the level of water rise in the tank in half an hout ?

45. Water is flowing at the rate of 15 km per hour though a pipe of diameter 14 cm into a rectangular which is 50 m long and 44 m wide.

Find the time in which the level of water in the tank will rise by 21 cm.

46. A farmer runs a pipe of internal diameter 20 cm from the canal into a cylindrical tank in his field which is 10 m in diameter and 2 m deep. If water flows through the pipe at the rate of 3 km/h, in how much time will the tank be filled?

47. water is flowing at the rate of 2.52 km/h through a cylindrical pipe into a cylindrical tank, the radius of whose base is 40 cm, If the increase in the level of water in the tank, in half an hour is 3.15 m, find the internal diameter of th pipe.

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48. A 21-m-deep well with diameter 6 m is dug and the earth from digging is evenly spead to

form a platform $27m \times 11$ m. Find the height of the platfrom.

49. A well of diameter 4 m is dug 14 m deep. The earth taken out of it is spread evenly all around the well to form a 40-cm-high embankment. Find the width the embankment.

50. From each end of a solid metal cylinder, meral was scooped out in hemispherical form same diameter. The height of the cylinder is 10 cm and its base is of radius 4.2 cm. The rest the cylinder is melted and converted into a cylindrical wire of 1.4 cm thickness. Find the length of the wire.

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51. 50 circular plates each of radius 7 cm and thickness 5 mm are placed one above another to form a solid right circular cylinder. Find the total surface area of the cylinder so formed.

52. A copper wire, 3 mm in diameter, is wound about a cylinder whose length is 12 cm, and diameter 10 cm, so as to cover the curved surface of the cylinder. Find the length and

mass of the wire, assuming the density of copper to be `8. 88g"\ "p e r"\

53. A cistern, internally measuring 150 cm x 120 cm x 110 cm, has 129600 cu.cm of water in it. Porous bricks are placed in the water until the cistern is full to the brim. Each brick absorbs one-seventeenth of its own volume of water. How many bricks can be put in without

overflowing the water, each brick being 22.5 cm x 7.5 cm x 6.5 cm?

54. A right triangle, whose sides are 3 cm and 4 cm (other than hypotenuse) is made to revolve about its hypotenuse. Find the volume and surface area of the double cone so formed.

55. An open metal bucket is in the shape of a frustum of a cone of height 21 cm with radii of its lower and upper ends as 10 cm and 20 cm respectively. Find the cost of milk which can completely fill the bucket at Rs. 30 per litre.

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56. A bucket open at the top, and made up of a metal sheet is in the form of a frustum of a cone. The depth of the bucket is 24 cm and the diameters of its upper and lower circular ends

are 30 cm and 10 cm respectively. Find the cost of metal sheet used in it at the rate of Rs 10 per Crn . | USe TC-3. f metal sh d in itat th f Rs 10 per 100 cm". [U 3.14

57. A bucket is in form of a frustum of a cone with a copacity of $12308.8cm^3$ of water. The radii of the top and bottom circular ends are 20 cm and 12 cm respectively. Find the height
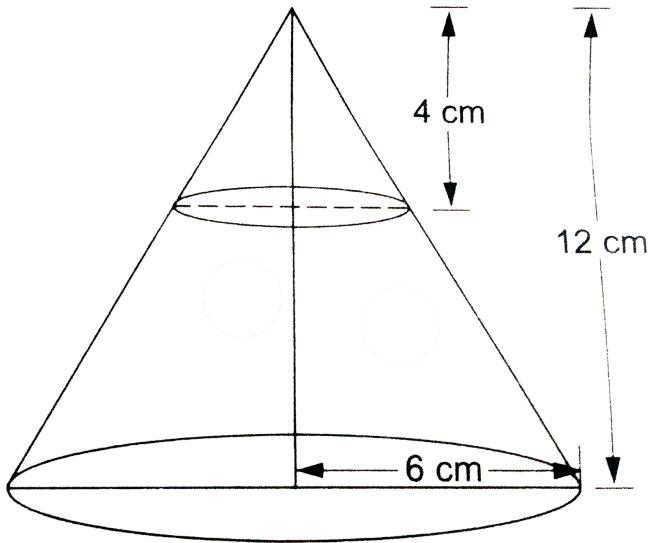
of the bucket and the area of the metal sheet used in its making. [Use $\pi = 3.14$.]

58. In the figure, from top of a solid cone of height 12 cm and base radius 6 cm, a cone of height 4 cm is removed by a plane parallel to the base. Find the total surface area of the remaining solid.

$$\left[\text{ Use } \pi = \frac{22}{7} \quad \text{and} \quad \sqrt{5} = 2.236. \right]$$

59. An open metal bucket is in the shape of a frustum of a cone, mounted on a hollow cylindrical base made of the same metallic

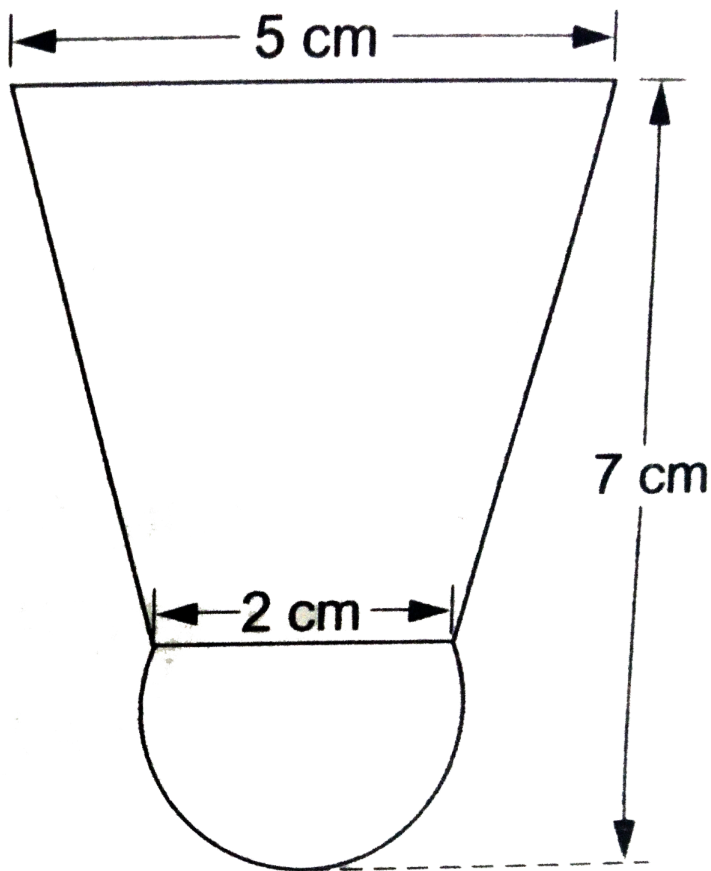sheet. The diameters of the two circular ends of the bucket are 45 cm and 25 cm, the total vertical height of the bucket i

60. A shuttlecock used for playing badminton has the shape of a frustum of the frustum are 5 cm and 2 cm, and the height of the entire shuttlecock is 7 cm. Find its external surface

area.

61. The slant height of the frustum of a cone is 4 cm and the perimeters of its circular ends are 18 cm and 6 cm. Find the curved surface of the frustum.

62. The height of a cone is 10 cm. The cone is divided into two parts using a plane parallel to its base at the middle of its height. Find the ratio of the volumes of the two parts.

63. 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 $\dfrac{1}{27}$ of the volume of the given cone, at what height above the base is the section mode?

64. A Hollow cone is cut by a plane parallel to the base and upper portion is removed. If the

curved surface of the remainder is 8/9 of the curved surface of the whole cone; find the ration of the line-segment into which the cone's altitude is divided by the plane.

65. A solid metallic right circular cone 20 cm high with vertical angle $60o$ is cut into two parts at the middle point of its height by a plane parallel to the base. If the frustum, so

obtained, be drawn into a wire of diameter $\frac{1}{16}$ cm , find the length of the wire.

Volume And Surface Area Of A Combination Of Solids Solved Examples

1. A juice seller was serving his customers using glasses. The inner diameter of the cylindrical 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

2. 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

$15cm \times 10cm \times 3.5cm$.The radius of each of

the depression is 0.5 cm and the depht is 1.4

cm .Find the volume of the wood in the entire

stand correct to 2 decimal places.

Exercise 17 A

1. Two cubes each of volume $27cm^3$ are joined end to end to form a solid. Find the surface area of the resulting cuboid.

2. The volume of a hemisphere is $24251cm^3$ Find its curved surface area

3. If the total surface arecl of a solid hemisphere is $462 cm^2$ find its volume

4. A $5m$ -wide cloth is used to make a conical tent of base diameter 14 m and 24 m. Find the cost of cloth used at the rate of ₹ 25 per metre.

(ii) The radius and height of a solid right-circular cone are in the ratio of 5 : 12. If its volume is $314 cm^3$, find its total surface area

5. If the volumes of two cones are in the ratio 1:4 and their diameters are in the ratio 4:5, then the ratio of their heights, is

6. एक शंक्वाकार पर्वत की तिर्यक ऊंचाई 2.5 किमी. है और उसके आधार का क्षेत्रफल $1.54 km^2$ है $\pi = \dfrac{22}{7}$ लेते हुए पर्वत की ऊंचाई है।

7. The sum of radius of the base and height of a cylinder is 37 m. If the total surface area of the cylinder is $1628 m^2$, find the curved surface area and volume of the cylinder

8. The surface area of a sphere is $2464cm^2$ If its radius be doubled, what e surface area of the new sphere?

9. A military ten of height 8.25m is in the form of a right circular cylinder of base diameter 30m and height 5.5m surmounted by right circular cone of same base radius. Find the

length of the canvas use in making the tent. If the breadth of the canvas is 1.5m.

10. A tent is in the shape of a right circular cylinder up to a height of 3 m and conical above it. The total height of the tent is 13.5 m and the radius of its base is 14 m. Find the cost of cloth required to make the tent at the rate of ₹ 80 per square metre.[Take $\pi = \dfrac{22}{7}$]

11. A circus tent is cylindrical to a height of 3 metres and conical above it. If its diameter is 105 m and the slant height of the conical portion is 53 m, calculate the length of the canvas 5m wide to make the required tent.

12. A rocket is in from of a circular cylinder closed at the lower end and a cone of the same readius is attached to the top. The

radius of the cylinder is 2.5 m, its height is 12m and the slant height of the cone is 8 m.Calculate the total surface area of the rocket .

13. A solid is in the shape of a cone surmounted on a hemi-sphere, the radius of each of them is being 3.5 cm and the total height of solid is 9.5 cm. Find the volume of the solid. (Use $\pi = 22/7$)

14. 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.

15. A toy is in the shape of a cone mounted on a hemisphere of same base radius. If the

volume of the toy is 231 cm^3 and its diameter is 7 cm, find the height of the toy

16. A cylindrical container of radius 6 cm and height 15 cm is filled with ice cream. The whole ice cream has to be distributed to 10 children in equal cones with hemispherical tops .If the height of the conical portion is 4 times the radius of its base, find the radius of the ice cream cone.

17. A vessel is in the form of a hemispherical bowl surmounted by a hollow cylinder. The diameter of the hemispherical is 21 cm and the total height of the vessel is 14.5 cm . Find its capacity.

18. 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 m .

19. A medicine capsule is in the shape of a cylinder with two hemispheres stuck to each.The length of the entire capsule is 14 mm and the diameter 7 mm find the total surface area of the article

20. A solid is in the form of a right circular cone mounted on a hemisphere. The radius of the hemisphere is 2.1 cm and the height of the cone is 4 cm. The solid is placed in a cylindrical tub full of water in such a way that the whole solid is submerged in water left in the tub..If the radius of the cylindrical vessel is 5 cm and its height is 9.8 cm ,find the volume of water left in the tub to the nearest cm 3 .

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21. From a solid cylinder whose height is 8 cm and radius 6cm , a conical cavity of height 8 cm and of base radius 6 cm is hollowed out . Find the volume of the remaining solid.Also find the total surface area of the reamining solid.[Take $\pi = 3.14$]

22. From a solid cylinder of height 14 cm and base diameter 7 cm, two equal conical holes

each of radius 2.1 cm and height 4 cm are cut off. Find the volume of the remaining solid.

23. A metallic cylinder has radius 3 cm and height 5 cm, To reduce its weights, a conical hole is drilled in the cylinder. The conical hole has a radius 3/2 cm and its depth 8/9 cm calculate the ratio of the volume of metal left in the cylinder to the volume of metal taken out in conical shape

24. From a solid cylinder of height 14cm and base diameter 7cm,two equal conical holes each of radius 2.1cm and height 4cm are cut off. Find the volume of remmaining solid.

25. A spherical glass vessel has a cylindrical neck 7 cm long and 4 cm in diameter. The

diameter of the spherical part is 21 cm. Find the quantity

26. From a cubical piece of wood of side 21 cm, a hemisphere is carved out in such a way that the diameter of the hemisphere is equal to the side of the cubical piece. Find the surface area and volume of the remining piece.

27. (i) A hemisphere of maximum possible diameter is placed over a cuboidal block of side 7 cm. Find the surface area of the solid so formed.

(ii) A cubical block of side 10 cm is surmounted by a hemisphere. What is the largest diameter that the hemisphere can have ? Find the cost of painting the total surface area of the solid so formed, at the rate of Rs. per 100 sq cm. [Use $\pi = 3.14$.]

28. A toy is in the shape of a right circular cylinder with a hemisphere on one end and a cone on the other. The radius and height of the cylindrical part are 5 cm and 13 cm respectively. The radii of the hemispherical and conical parts are the same as that of the cylindrical part. Find the surface area of the toy if the total height of the toy is 30 cm.
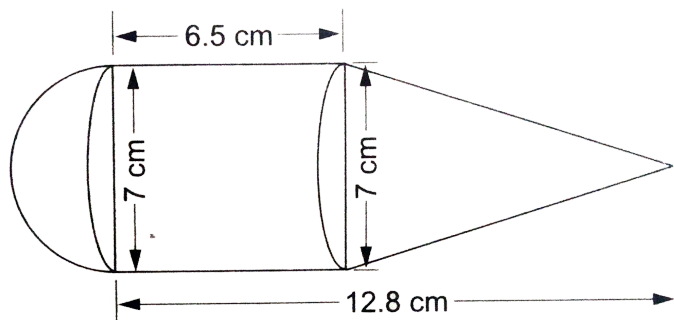
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Exercise 17 A

1. A wooden article was made by scooping out a hemisphere from each end of a cylinder as shown in the figure .If the height of the cylinder is 20 cm and its base is of diameter 7 cm , find the total surface area of the area of

the article when it is ready .
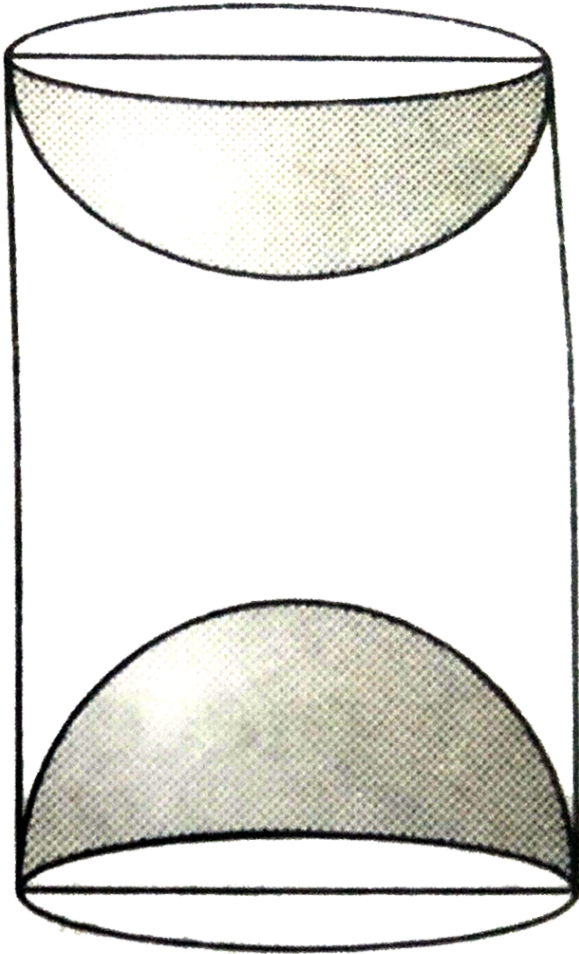
2. The given figure represents a solid consisting of a cylinder surmounted by a cone at one end and a hemishpere at the other. Find the volume of the solid.
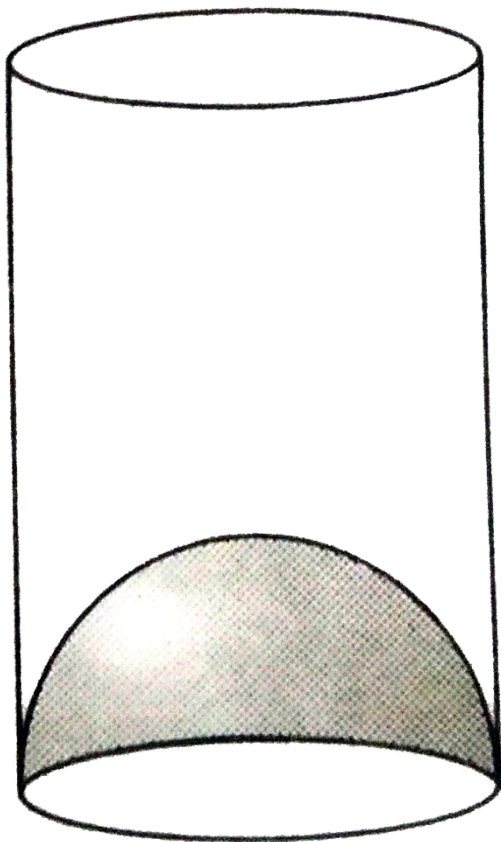
3. The inner diameter of a glass is 7 cm and it has a raised portion in the bottom in the

shape of a hemisphere, as shown in the figure. If the height of the glass is 16 cm, find the apparent capacity and the actual capacity of the glass.

4. A wooden toy rocket is in the shape of a cone mounted on a cylinder, as shown in figure. The height of the entire rocket is 26 cm, while the height of the conical part is 6 cm. The base of the conical partition has a diameter of 5 cm, while the base diameter of the cylindrical protion is 3 cm.
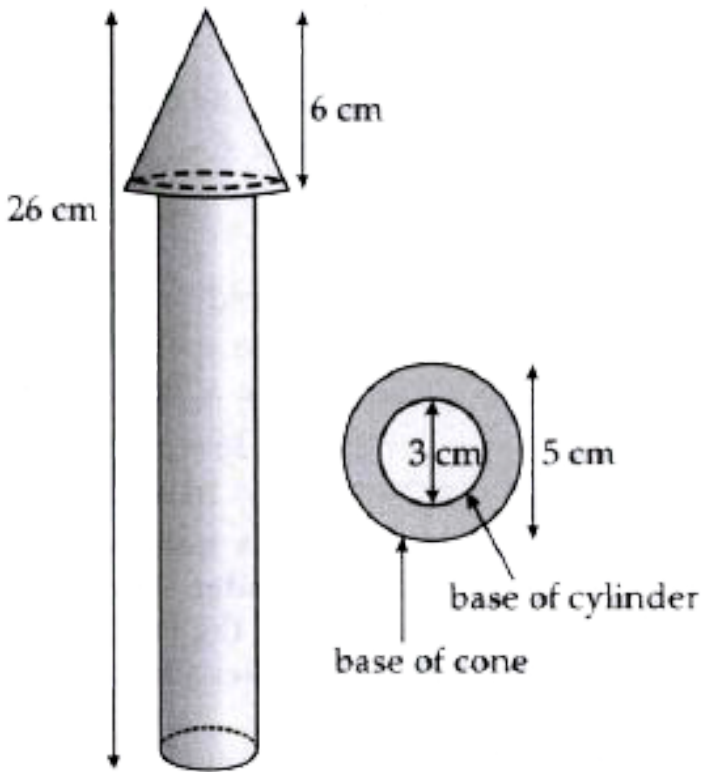
If the conical portion is to be painted orange, find the area to be painted orange. Find the area of the rockeeet peainted with each of these colours? (Take π = 3.14)

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1. A solid metallic cuboid of dimensions $9m \times 8m \times 2$ is melted and recast in to solid cubes of edge 2 m .find the number of cubes so formed.

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2. A cone of height 20 cm and radius of base 5 cm is made up of modelling clay. A child

reshpes it in the form of a sphere. Find the diameter of the sphere.

3. Metallic spheres of radii 6 cm, 8 cm and 10 cm respectively, are melted to form a single solid sphere. Find the radius of the resulting sphere.

4. A solid metal cone with radius of base 12 cm and height 24 cm is melted to form solid spherical balls of diameter 6 cm each. Find the number of balls thus formed.

5. The radii of internal and external surfaces of a hollow spherical shell are 3 cm and 5 cm respectively. It is melted and recast into a solid

cylinder of diameter 14 cm. Find the height of the cylinder.

6. The diameters of the internal and external surfaces of a hollow spherical shell are 6 cm and 10 cm respectively. If it is melted and recast into a solid cylinder of diameter 14 cm, find the height of the cylinder.

7. A copper rod of diameter 2 cm and length 10 cm is drawn into a wire of uniform thickness and length 10 m. Find the thickness of the wire.

8. A hemispherical bowl of internal diameter 30 cm contains some liquid. This liquid is to be filled into cylindrical - shaped bottles each of diameter 5 cm and height 6 cm. Find the

number of bottles necessary to empty the bowl.

9. A solid metallic sphere of diameter 21 cm is melted and recast into a number of smaller cones, each of diameter 3.5 cm and height 3 cm. Find the number of cones so formed.

10. A spherical cannonball 28 cm in diameter is melted and cast into a right circular cone mould, whose base is 35 cm in diameter. Find the height of the cone.

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11. A spherical ball of radius 3 cm is melted and recast into the spherical balls. The radii of two of these balls are 1.5 cm and 2 cm. Find the radius of the third balls.

12. A spherical shell of lead whose external and internal diameters are respectivel24 cm and 18 cm, is melted an recast into a right cirucular cylinder 37 cm hight. Find the diameter of the cylinder.

13. A hemisphere of lead of radius 9 cm is cast into a right circular cone of height 72 cm. Find

the radius of the base of the cone.

14. A balll of diameter 21 cm is melted and recast into cubes, each of side 1 cm. Find the number of cubes so formed.

15. How many lead balls, each of radius 1 cm, can be made from a sphere of radius 8 cm ?

16. A solid sphere of radius 3 cm is melted and then cast into smaller spherical balls, each of diameter 0.6 cm. Find the number of small balls thus obtained.

17. The diameter of a sphere is 42 cm. It is melted and drawn into a cylindrical wire of

diameter 2.8 cm. Find the length of the wire.

18. The diameter of a copper sphere is 18 cm. It is melted and drawn into a long wire of uniform cross section. If the length of the wire is 108 m, find its diameter.

19. A hemispherical bowl of internal radius 9cm is full of water. Its contents are emptied in a cylindrical vessel of internal radius 6cm. Find the height of water in the cylindrical vessel.

20. A hemispherical tank full of water is emptied by a pipe at the rate of $\dfrac{25}{7}$ litres per second. How much time will it take to empty half the tank, if it is 3m in diameter?

21. The rain water from a roof of $44m \times 20m$ drains into a cylindrical tank having diameter of base 4 m height 3.5 m. If the tank is just full, find the rainfall in cm.

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22. The rain water from a roof $22m \times 20m$ drains into a cylindrical vessel having a

diameter of 2m and height 3.5 m. If the vessel is just full, then the rainfull (in cm) is :

23. A solid right circular cone of height 60 cm and radius 30 cm is dropped in a right circular cylinder full of water, of height 180 cm and radius 60 cm. Find the volume of water left in the cylinder, in cubic metres.

24. Water is flowing through a cylindrical pipe of internal diameter 2 cm, into a cylinderical tank of base radius 40 cm, at the rate of 0.4 m per second. Determine the rise in level of water in the tank half an hour.

25. Water is flowing at the rate of 6km/hr through a pipe of diameter 14 cm into a rectangular tank which is 60 m long and 22 m

wide. Determine the time in which the level of water in the tank will rise by 7 cm.

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26. Water in a canal 5.4 m wide and 1.8 m deep is following with a speed of $25km/hr$ How much area can it irriagae in 40 munutes if 10 cm of standing watr is required for irrigation?

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27. A farmer connects a pipe of internal diameter 25 cm from a canal into a cylindrical tank in his field, which is 12 m in diameter and 2.5m deep. If water flows through the pipe at the rate of 3.6 km/hr, in how much time will the tank be filled ? Also, find the cost of water if the canal depertment charges at the rate of ₹ 0.07 per m^3.

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28. Water running in a cylindrical pipe of inner diameter 7 cm, is collected in a container at the rate of 192.5 litres per minute. Find the rate of flow of water in the pipe in km/hr.

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29. 150 spherical marbles, each of diameter 14 cm, are dropped in a cylindrical vessel of diameter 7 cm containing some water, which

are completely immersed in water. Find the rise in the level of water in the vessel.

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30. Mearbles of diameter 1.4 cm are dropped into a cylindrical beaker of diameter 7 cm, containing some water. Find the number of marbles that should be dropped into the beaker so that the water level rises by 5.6 cm.

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31. A well with 10 m diameter is dug 14 m deep. Earth taken out of it is spread all around to form an embankment of width 5 m. Find the height of the embankment.

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32. In a corner of a rectangular field with dimension $35m \times 22m$, a well with 14 m inside diameter is dug 8 m deep. The earth dug out is spead evenly over the remaining part of the field. Find the rise in the level of the field.

33. A copper wire of diameter 6 mm is evenly wrapped on a cylinder of length 18 cm and diameter 49 cm to vover its whole surface. Find the length and the volume of the wire. If the density of copper be 8.8 g per cu-cm, find the weight of the wire.

34. A Right triangle whose sides are 15 cm and 20 cm; is made to revolve about its hypotenuse. Find the volume and surface area of the double cone so formed.

35. In a hospital used water is collected in a cylindrical tank of diameter 2 m and hight 5 m.After recycling this water is used to irrigate a park of hospital whose length is 25 m and

breadth is 20 m. If tank is filled completely then what will be the height of standing water used for irigating the park write your views on recycling of water.

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1. A drinking glass is in the shape of a frustum of a cone of height 14 cm, The diameters of its

two circular ends are 16 cm and 12 cm. Find the capacity of the glass.

2. The radii of the circular ends of a solid frustum of a cone are 18 cm and 12 cm and its height is 8 cm. Find its total surface area. [Use $\pi = 3.14$.]

3. A metallic bucket, open at the top, of height 24 cm is in the form of the frustum of a cone, the radii of whose lower and upper circular ends are 7 cm and 14 cm respectively. Find

(i) the volume of water can completely fill the bucket,

(ii) the are of the metal sheet to make the bucket.

4. A continer, open at the top, is the form of a frustum of a cone of height 24 cm with of its lower upper circular as 8 cm and 20 cm respectively. Find the cost of milk which can completely fill the container at the rate ₹ 21 per litre.

5. A container made of a metal sheet open at the top is the form of frustum of the cone,

whose height is 16 cm and the radii of its lower and upper circular edges are 8 cm and 20 cm respectively. Find

(i) the cost of metal sheet to make the container if it costs ₹ 10 per $100cm^2$

(ii) the cost of milk at the rate of ₹ 35 per litre which can fill it completely.

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6. The radii of the circular ends of a solid frustum of a cone are 33 cm and 27 cm and its

slant height is 10 cm. Find its total surface area.

7. A bucket is in the form of a frustum of a cone. Its depth is 15 cm and the diameters of the top and the bottom are 56 cm and 42 cm respectively. Find how many litres of water the bucket can hold. [Take $\pi = \dfrac{22}{7}$].

8. A bucket made up of a metal sheet is in the form of a frustum of cone of height 16 cm with radii of its lower and upper ends as 8 cm and 20 cm respectively. Find the cost of the bucket if the cost metal sheet used is ₹ 15 per $100cm^2$. [Use $\pi = 3.14$]

9. A bucket made up of a metal sheet is in the form of frustum of a cone. Its depth is 24 cm and the diameters of the top and bottom are

30 cm and 10 cm respectively. Find the cost of milk which can completely fill the bucket at the rate of ₹ 20 per litre adn the cost of metal sheet used if it costs ₹ 10 per $100cm^2$. [Use $\pi = 3.14$.]

10. A container in the shape of a frustum of a cone having diameters of its two circular faces as 35 cm and 30 cm and vertical height 14 cm, is completely filled with oil. If each cm^3 of oil

has mass 1.2 g then find the cost of oil in the container if it costs ₹40 per kg.

11. A bucket is in the form of a frustum of a cone and it can hold 28.49 litres of water. If the radii of its circular ends are 28 cm and 21 cm, find the height of the bucket.

12. The radii of the circualr ends of a bucket of height 15 cm are 14 cm and r cm $(r < 14)$. If the volume of the bucket is $5390cm^3$, find the value of r.

13. The radii of the circular ends of a solid frustum of a cone are 33 cm and 27 cm and its slant height is 10 cm. Find its total surface area.

14. A tent is made in the form of a frustum of a cone surmounted by anoter cone. The diametere of the base top of the frustum are 20m and 6m respectvely, and the height is 24m. If the height of the tent is 28 m and the radius of the conical part is equal to the radius of the top of the frustum, fidn the quantity of can vas required. [Take $\pi = \dfrac{22}{7}$]

15. A tent consists of a frustum of a cone, surmounted by a cone. If the diameters of the upper and lower and circular ends of the frustum be 14 m and 26 m respectively, the height of the frustum be 8 m and the slant height of the surmounted conical portion be 12 m, find the area of the canvas required to make the tent. (Assume that the radii of the upper circular end of the frustum and the base of the surmounted conical portion are equal).

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16. The perimeters of the two circualr ends of a frustum of a cone are 48 cm and 36 cm. If the height of the frustum is 11 cm, find its volume and curved surface area.

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17. A solid cone of base radius 10 cm is cut into two parts through the mid-point of its height,

by a plane parallel to its base. Find the ratio in the volumes of two parts of the cone.

18. The height of a right circular cone is 20 cm. A small cone is cut off at the top by a plane parallel to the base. If its volume be $\dfrac{1}{8}$ of the volume of the given cone, at what height above the base is the section made?

19. Solid metallic right circular cone 20 cm high and whose vertical angle is $60°$, is cut into two parts at the middle of its height by a plane parallel to its base. If the frustum so obtained be drawn into a wire of diameter $\dfrac{1}{12}cm$, find the length of the wire.

20. A right circular cone is divided into three parts by trisecting its height by two planes drawn parallel to the base. Show that the

volumes of the three portions starting from the top are in the ratio 1 : 7: 19.

Exercise 17 C

1. A fez, the cap used by the Turks, is shaped like the frustum of a cone. If its radius on the open side is 10 cm, radius at the upper base is 4 cm and its slant height is 15 cm, find the area of material used for making it.
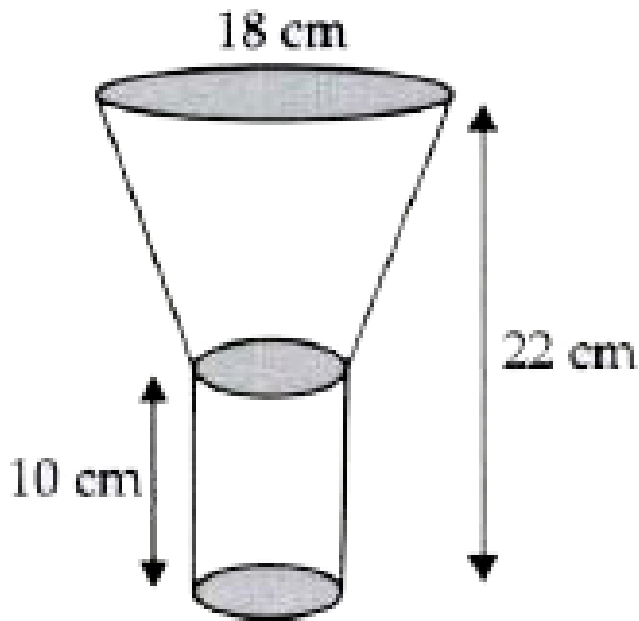
2. An oil funnel made of tin sheet consists of a 10 cm long cylindrical portion attached to a frustum of a cone. If the total height is 22 cm, diameter of the cylindrical portion is 8 cm and the diameter of the top of the funnel is 18 cm, find the area of the tin sheet required to make

the funnel

18 cm

22 cm

10 cm

Exercise 17 D

1. A river 1.5 m deep and 36 m wide is flowing at the rate of 3.5 km/hr. Find the amount of water (in cubic metres) that into sea per minute.

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2. If the volume of a cube is $729cm^3$,then its surface area will be:

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3. How many cubes of 10 cm edge can be put in a cubical box of 1 m edge?

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4. Three cubes of iron whose edges are 6 cm, 8 cm and 10 cm respectively formed into a single cube. The edge of the new cube is

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5. Five equal cubes, each of edge 5 cm, are placed adjacent to each other. The volume of the cuboid so formed, is

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6. The volumes of two cubes are in the ratio 8 : 27. Find the ratio of their surface areas.

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7. The volume of a right cirular cylinder with its height equal to the redius is $25\frac{1}{7}cm^3$. Find the height of the cylinder.

8. The ratio between the radius of the base and the height of a cylinder is 2 : 3. If the volume of the cylinder is $12936cm^3$, find the radius of the base of the cylinder.

9. If the radii of two cylinders are in the ratio 2:3 and their heights are in the ratio 5:3, then find the ratio of their volumes.

10. 66 cubic centimetres of silver is drawn into a wire 1 mm in diameter. The length of the wire in metres will be (a) 84 (b) 90 (c) 168 (d) 336

11. If the are of the base of a right circular cone is $3850cm^2$ and its height is 84 cm, find the slant height of the cone.

12. A metallic cylinder of radius 8 cm and height 2 cm is melted and converted into a right circular cone of height 6 cm . The radius of the base of this cone is

13. A right cylindrical vessel is full of water. How many right cones having the same radius and height as those of the right cylinder will be needed to store that water? (a) 2 (b) 3 (c) 4 (d) 8

14. Find the surface area of a sphere whose volume is $4851 cm^3$

15. The curved surface area of a sphere is 5544 sq. cm. Its volume is (a) 22176 cm3 (b) 33951 cm3 (c) 38808 cm3 (d) 42304 cm3

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16. The surface area of a sphere is $5544cm^3$. Find its volume.

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17. A solid metallic sphere of radius 8 cm is melted and recast into spherical balls each of radius 2 cm. The number of spherical balls, thus obtained, is (a) 16 (b) 48 (c) 64 (d) 82

18. How many lead shots each 3 mm in diameter can be made from a cuboid of dimensions $9cm \times 11cm \times 12cm$? (a) 7200 (b) 8400 (c) 72000 (d) 84000

19. A metallic cone of radius 12 cm and height 24 cm is melted and made into spheres of radius 2 cm each. How many spheres ae formed ?

20. A hemisphere of lead of radius 6 cm is cast into a right circular cone of height 75 cm. Find the radius of the base of the cone.

21. A copper sphere of diameter 18 cm is drawn into a wire of diameter 4 mm. Find the length of the wire.

22. The radii of the circulr ends of a frustum of height 6 cm are 14 cm and 6 cm respetively. Find the slant height of the frustum.

23. Determine the ratio of the volume of a cube to that of a sphere which will exactly fit inside the cube.

24. Find the ratio of the volumes of a cylinder, a cone and a sphere, if each has the same diameter and same height ?

25. Two cubes each of volume 125 cm^3 are joined end to end .Find the volume of resulting cuboid.

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26. Three metallic cubes whose edges are 3 cm, 4 cm and 5 cm, are melted and recast into a single cube. Find the edge of the new cube formed.

27. A solid metallic sphere of diameter 8 cm is melted and drawn into a cylindrical wire of uniform width. If the length of the wire is 12 m, find its width.

28. A 5 m wide cloth is used to make a conical tent of base diameter 14 m and height 24. Find

the cost of cloth used at the rate of Rs 25 per metre. [Use $\pi = 22/7$]

29. An wooden toy is made by scooping out a hemisphere of same radius from each end of a solid cylinder. If the height of the cylinder is 10 cm, and its base is of radius 3.5 cm, find the volume of wood in the toy. (Use $\pi = 22/7$)

30. Three cubes of metal whose edges are in the ratio 3:4:5 are melted down in to a single cube whose diagonal is $12(\sqrt{3})$ cm. Find the edges of the three cubes.

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31. A hollow sphere of internal and external diameters 4 cm and 8 cm respectively is melted into a cone of base diameter 8 cm. Calculate the height of the cone.

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32. A bucket of height 24 cm is in the form of frustum of the cone whose circular ends are of diameter 28 cm and 42 cm. Find the cost of milk at the rate ₹ 30 per litre, which the bucket can bold.

33. The interior of a building is in the form of a right circular cylinder of diameter 4.2 m and

height 4 m surmounted by a cone of same diameter. The height of the cone is 2.8 m. Find the outer surface area of the building.

34. A metallic solid right circular cone is of height 84 cm and the radius of its base is 21 cm. It is melted and recast into a solid sphere. Find the diameter of the sphere.

35. 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.

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36. If the radii of the circular ends of a bucket 28 cm high, are 28 cm and 7 cm, find its capacity and total surface area.

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37. A bucket is in form of a frustum of a cone with a copacity of $12308.8 cm^3$ of water. The radii of the tope bottom circular ends are 20 cm and 12 cm respectively. Find the height of the bucket and the area of the metal sheet used in its making. [Use $\pi = 3.14.$]

38. A milk container is made of metal sheet in the shape of frustum of a cone whose volume

is $10459\dfrac{3}{7} cm^2$. The radii of its lower and upper circular ends are 8 cm and 20 cm respectively. Find the cost of metal sheet used in making the container at the rate of Rs. 1.40 per square centimeter.

39. A solid metallic sphere of diameter 28 cm is melted and recast into a number of smaller cones, each of diameter $4\dfrac{2}{3}$ cm and height 3 cm. Find the number of cones so formed.

40. A cylindrical vessel with internal diameter 10 cm and height 10.5 cm is full of water. A solid cone of base diameter 7 cm and height 6 cm is completely immersed in water. Find the value of water (i) displaced out of the cylinder. (ii) left in the cylinder. (Take $\pi = 22/7$)

    A. $70cm^3$, $78cm^3$

    B. $75cm^3$, $740cm^3$

    C. $77cm^3$, $748cm^3$

D. None

Answer: C

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Multiple Choice Questions Mcq

1. A cylinder pencil sharpened at one edge is the combination of

A. a cylinder and a cone

B. a cylinder and frustum of a cone

C. a cylinder and a hemisphere

D. two cylinders and hemisphere

Answer: A

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2. During conversion of a solid from one shape

to another, the volume the new shape will

A. decrease

B. increase

C. remain unaltered

D. be doubled

Answer: C

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3. In a right circular cone, the corss - section made by a plane parallel to the base is a

A. a sphere

B. hemisphere

C. circle

D. a semicircle

Answer: C

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4. A solid piece of iron in the form of a cuboid of dimensions (49 $\times$ 33cm $\times$ 24 cm) is moulded to form a solid sphere . The radius of the sphere is

A. 19 cm

B. 21 cm

C. 23 cm

D. 25 cm

Answer: B

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5. 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. 2.1

B. 4.2

C. 8.4

D. 1.05

Answer: A

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6. A metallic solid sphere of radius 9 cm is melted to form a solid cylinder of radius 9 cm . The height of the cylinder is

A. 12 cm

B. 18 cm

C. 36 cm

D. 96 cm

Answer: A

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7. A rectangular sheet of paper 40 cm $\times$ 22

cm , is rolled to form a hollow cylinder of

height 40 cm . The radius of the cylinder (in cm) is

A. 3.5

B. 7

C. $\dfrac{80}{7}$

D. 5

Answer: A

8. The number of solid spheres , each of diameter 6 cm , that can be made by melting a solid metal cylinder of height of 45 cm and diameter 4 cm , is

   A. 2

   B. 4

   C. 5

   D. 6

Answer: C

9. The surface areas of two spheres are in the

ratio $16:9$. The ratio of their volumes is

A. $64:27$

B. $16:9$

C. $4:3$

D. $16^3:9^3$

Answer: A

10. If the surface area of sphere is $616 cm^2$, its diameter (in cm) is

A. 7

B. 14

C. 28

D. 56

Answer: B

11. If the radius of a sphere becomes 3 times then its volume will become

    A. 3 times

    B. 6 times

    C. 9 times

    D. 27 times

Answer: D

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12. If the height of a bucket in the shape of frustum of a cone is 16 cm and the diameters of its two circular ends are 40 cm and 16 cm then its slant height is

    A. 20 cm

    B. $12\sqrt{5}$ cm

    C. $8\sqrt{13}$ cm

    D. 16 cm

Answer: A

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13. A sphere of diameter 18 cm is dropped into a cylindrical vessel of diameter 36 cm , partly filled with water . If the sphere is completely submerged then the water level rises by

   A. 3 cm

   B. 4 cm

   C. 5 cm

   D. 6 cm

Answer: A

14. A solid right circular cone is cut into two parts at the middle of its height by a plane parallel to its base . The ratio of the volume of the smaller cone to the whole cone is

A. $1:2$

B. $1:4$

C. $1:6$

D. $1:8$

Answer: D

15. The radii of the circular ends of a bucket of height 40 cm are 24 cm and 15 cm . The slant height (in cm) of the bucket is

A. 41

B. 43

C. 49

D. 51

Answer: A

16. A solid is hemispherical at the bottom and conical (of same radius) above it . If the surface areas of the two parts are equal then the ratio of its radius and the slant height of the conical part is

A. $1:2$

B. $2:1$

C. $1:4$

D. $4:1$

Answer: A

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17. If the radius of the base of a right circular cylinder is halved,keeping the height the same then the ratio of the volume of the culinder thus obtained to the volume of original cuylinders is

A. $1:2$

B. $2:1$

C. $1:4$

D. $4:1$

Answer: C

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18. A cubical ice-cream brick of edge 22 cm is to be distributed among some children by filling ice-cream cones of radius 2 cm and height 7

cm up to its brim . How many children will get

the ice-cream cones ?

A. 163

B. 263

C. 363

D. 463

Answer: C

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19. A mason constructs a wall of dimensions (270 cm × 300 cm × 350 cm) with bricks , each of size (22.5 cm × 11.25 × 8.75 cm) and it is assumed that $\dfrac{1}{8}$ space is covered by the mortar . Number of bricks used to construct the wall is

   A. 11000

   B. 11100

   C. 11200

   D. 11300

Answer: C

20. Twelve solid spheres of the same size are made by melting a solid metallic cylinder of base diameter 2 cm height 16 cm . The diameter of each sphere is .

A. 2 cm

B. 3 cm

C. 4 cm

D. 6 cm

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21. The diameters of two circular ends of a bucket are 44 cm and 24 cm and the height of the bucket is 35 cm . The capacity of the bucket is

A. 31.7 litres

B. 32.7 litres

C. 33.7 litres

D. 34.7 litres

Answer: B

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22. The slant height of a bucket is 45 cm and the radii of its top and and bottom are 28 cm and 7 cm respectively . The curved surface area of the bucket is

A. $4953cm^2$

B. $4952cm^2$

C. $4951cm^2$

D. $4950cm^2$

Answer: D

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23. The volume of two spheres are in the ratio

of $64:27$. The ratio of surface area is

A. $9:16$

B. $16:9$

C. $3:4$

D. $4:3$

Answer: B

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24. A hollow cube of internal edge 22 cm is filled with spherical marbles of diameter 0.5

cm and $\dfrac{1}{8}$ space of the cube remains unfilled .

Number of marbles required is

A. 142296

B. 142396

C. 142496

D. 142596

Answer: A

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25. A metallic spherical shell of internal and external diameters 4 cm and 8 cm respectively , is melted and recast into the form of a cone of base diameter 8 cm . The height of the cone is

    A. $12cm$

    B. 14cm

    C. 15cm

    D. 8cm

Answer: B

26. A medicine -capsule is the shape of a cylinder of diameter 0.5 cm with two hemisphere stuck to each of its ends. The length of entire capsule is 2cm. The capacity of the capsule is

A. $0.33 cm^2$

B. $0.34 cm^3$

C. $0.35 cm^3$

D. $0.36 cm^3$

Answer: D

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27. The length of the longest pole that can be kept in a room $(12m \times 9m \times 8m)$ is

    A. 29 m

    B. 21 m

    C. 19 m

D. 17 m

Answer: D

28. The length of the diagonal of a cube is $6\sqrt{3}$

cm . Its total surface area is

A. $144 cm^2$

B. $216 cm^2$

C. $180 cm^2$

D. $108 cm^2$

Answer: B

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29. The volume of a cube is $2744 cm^3$. Its surface area is

    A. $196 cm^2$

    B. $1176 cm^2$

    C. $784 cm^2$

D. $588cm^2$

Answer: B

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30. If the total surface area of a cube is 864 square cm, find the volume of the cube:

    A. $3456cm^3$

    B. $432cm^3$

    C. $1728cm^3$

D. $3456 cm^3$

Answer: C

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31. How many bricks will be required to construct a wall 13.5 m long, 6 m high and 22.5 cm thick ? It is being given that each brick measured $(27 cm \times 12.5 cm \times 9 cm)$?

A. 8000

B. 6400

C. 4800

D. 7200

Answer: B

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32. The area of the base of a rectangular tank

is 6500 cm^2 and the volume of water

contained in it is 2.6 cubic metres. The depth

of the water in the tank is

A. 3.5 m

B. 4 m

C. 5 m

D. 8 m

Answer: B

33. The volume of a wall, 5 times as high as it is broad and 8 times as long as it is high, is 12.8 cu. metres. Find the breadth of the wall.

A. 30 cm

B. 40 cm

C. 22.5 cm

D. 25 cm

Answer: B

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34. If the areas of three adjacent faces of a

cuboid are x, y, z respectively, then the

volume of the cuboid is xyz (b) $2xyz$ (c) $\sqrt{xyz}$

(d) $3\sqrt{xyz}$

A. xyz

B. $2xyz$

C. $\sqrt{xyz}$

D. $3\sqrt{xyz}$

Answer: C

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35. The sum of length , breadht and hight of a cuboid is 19 cm and its diagonal is $5\sqrt{5}$ cm . Its surface area is

A. $361\ cm^2$

B. $125\ cm^2$

C. $236\ cm^2$

D. $486\ cm^2$

Answer: C

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36. Each edge of a cube is increased by 50%. Find the percentage increase in the surface area of the cube.

A. 0.5

B. 0.75

C. 1

D. 1.25

Answer: D

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37. How many bags of grain can be stored in a cuboidal granary $(8m \times 6m \times 3m)$, if each bag occupies a space of 0.64 m^3

   A. 8256

   B. 90

   C. 212

   D. 225

Answer: D

38. A cube of side 6 cm is cut into a number of cubes each of sides 2 cm . The number of cubes ,formed is

A. 6

B. 9

C. 12

D. 27

Answer: D

39. In a shower , 5 cm of rain falls . The volume of the water that falls on 2 hectares of ground , is

    A. $100 \ m^3$

    B. $10 \ m^3$

    C. $1000 \ m^3$

    D. $10000 m^3$

Answer: C

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40. Two cubes have their volumes in the ratio 1 : 27 . The ratio of their surface areas is

A. $1 : 3$

B. $1 : 8$

C. $1 : 9$

D. $1 : 18$

Answer: C

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41. Two diameter of the base of a cylinder is 4 cm and its height is 20 cm . The volume of the cylinder is

A. $176cm^3$

B. $196cm^3$

C. $276cm^3$

D. $352cm^3$

Answer: A

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42. The diameter of a cylinder is 28 cm and its height is 20 cm . The total surface area of the cylinder is

A. $2993cm^2$

B. $2992cm^2$

C. $2292\ cm^2$

D. $2229\ cm^2$

Answer: B

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43. The height of a cylinder is 14 cm and its curved surface area is 264 cm^2 . The volume of the cylinder is

    A. $308cm^3$

    B. $396cm^3$

    C. $1232cm^3$

    D. $1848cm^3$

Answer: B

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44. If the curved surface area of a cylinder is $1760cm^2$ and its base radius is 14 cm then its height is

    A. 10 cm

    B. 15 cm

    C. 20 cm

    D. 40 cm

Answer: C

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45. The ratio of the total surface area to the lateral surface area of a cylineder with base radius 80 cm and height 20 cm is

A. $2:1$

B. $3:1$

C. $4:1$

D. $5:1$

Answer: D

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46. 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. 4 m

   B. 5 m

   C. 6 m

   D. 7 m

Answer: C

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47. The ratio between the radius of the base and the height of the cylinder is 2:3. If its volume is 1617 cm^3 , the total surface area of the cylinderical is

    A. $308cm^2$

    B. $462cm^2$

    C. $540cm^2$

    D. $770cm^2$

Answer: D

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48. 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. $27 : 20$

B. $20 : 27$

C. $4 : 9$

D. $9 : 4$

Answer: B

49. Two circular cylinderical of equal volumes have their height in the ratio 1:2 . The ratio of their radii is

A. $1 : \sqrt{2}$

B. $\sqrt{2} : 1$

C. $1 : 2$

D. $1 : 4$

Answer: B

50. The radius of the base of a cone is 5 cm and ir=ts heights is 12 cm . Its curved surface area is

A. $60\pi cm^2$

B. $65\pi cm^2$

C. $30\pi cm^2$

D. none of these

Answer: B

51. The diameter of the base of a cone is 42 cm and its volume is 12936 cm^3 Its height is

A. 28 cm

B. 21 cm

C. 35 cm

D. 14 cm

Answer: A

▶

52. The area of the base of a right circular cone is $154 \ cm^2$ and its height is $14cm$. Its curved surface area is

A. $154\sqrt{5}cm^2$

B. $154\sqrt{7}cm^2$

C. $77\sqrt{7}cm^2$

D. $77\sqrt{5}cm^2$

Answer: A

53. On increasing each of the radius of the base and the height of a cone by 20% its volume will be increased by

    A. 52 %

    B. 75 %

    C. 62 %

    D. 72 %

Answer: D

54. 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. $9:8$

B. $3:4$

C. $8:9$

D. $4:3$

Answer: A

55. A metallic cylinder of radius 8 cm and height 2 cm is melted and converted into a right circular cone of height 6 cm . The radius of the base of this cone is

A. 4 cm

B. 5 cm

C. 6 cm

D. 8 cm

Answer: D

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56. The height of a conical tent is 14 m and its floor area is 346.5 m^2 . How much canvas , 1.1 m wide , will be required for it

A. 490 m

B. 525 m

C. 665 m

D. 860 m

Answer: B

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57. The diameter of a sphere is 14 cm. Its volume is

A. $1428cm^3$

B. $1430cm^3$

C. $1437\dfrac{1}{3}cm^3$

D. $1440cm^3$

Answer: C

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58. The ratio between the volumes of two spheres is 8 : 27. What is the ratiobetween their surface areas?

A. $2:3$

B. $4:5$

C. $5:6$

D. $4:9$

Answer: D

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59. A hollow metallic sphere with external diameter 8 cm and internal diameter 4 cm is melted and moulded into a cone having base radius 4 cm. The height of the cone is

A. 12 cm

B. 14 cm

C. 15 cm

D. 18 cm

Answer: B

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60. A metallic cone having base radius $2.1cm$ and height $8.4cm$ is melted and moulded into a sphere. The radius of the sphere is

A. $2.1 cm$

B. $1.05 cm$

C. $1.5 cm$

D. $2 cm$

Answer: A

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61. The volume of a hemisphere is 19404 cm^3.

The total surface area of the hemisphere is

A. $4158cm^2$

B. $16632cm^2$

C. $8316cm^2$

D. $3696cm^2$

Answer: A

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62. Find the volume of a sphere whose surface area is $154cm^2$

A. $179\frac{2}{3}cm^3$

B. $359\frac{1}{3}cm^3$

C. $1437\frac{1}{3}cm^3$

D. none of these

Answer: A

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63. The total surface area of a hemisphere of radius 7 cm is

A. $(588\pi)cm^2$

B. $(392\pi)cm^2$

C. $(147\pi)cm^2$

D. $(98\pi)cm^2$

Answer: C

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64. If the radii of the circular ends of a bucket

of height 40 cm are of lengths 35 cm and 14

cm, then the volume of the bucket in cubic

centimeters, is

A. 60060 cm^3

B. 80080cm^3

C. 70040cm^3

D. 80160cm^3

Answer: B

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65. If the radii of the circular ends of a bucket 24 cm high are 5 cm and 15 cm respectively, find the surface area of the bucket.

A. $1815.3 cm^2$

B. $1711.3 cm^2$

C. $2025.3 cm^2$

D. $2360 cm^2$

Answer: B

66. A circus tent is cylindrical to a height of 4 m and conical above it. If its diameter is 105 m and its slant height is 40 m, the total area of the canvas required in m^2 is

A. $1760m^2$

B. $2640m^2$

C. $3960m^2$
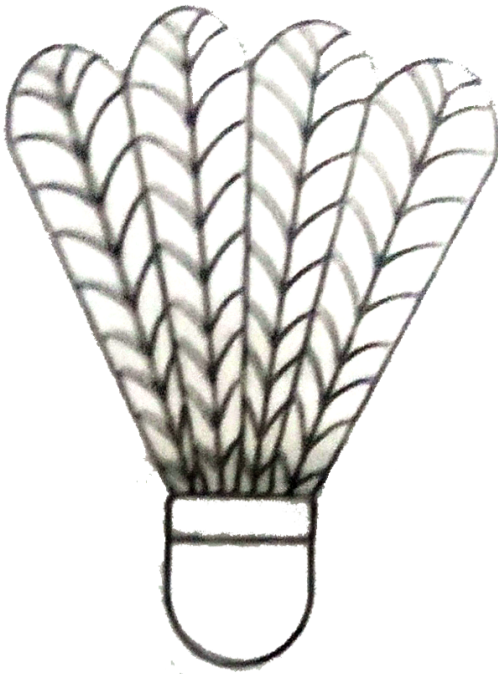
D. $7920m^2$

Answer: D

1. A shulltlecock used ofor playing badmintion is the combination of

Shuttlecock

A. cylinder and a hemisphere

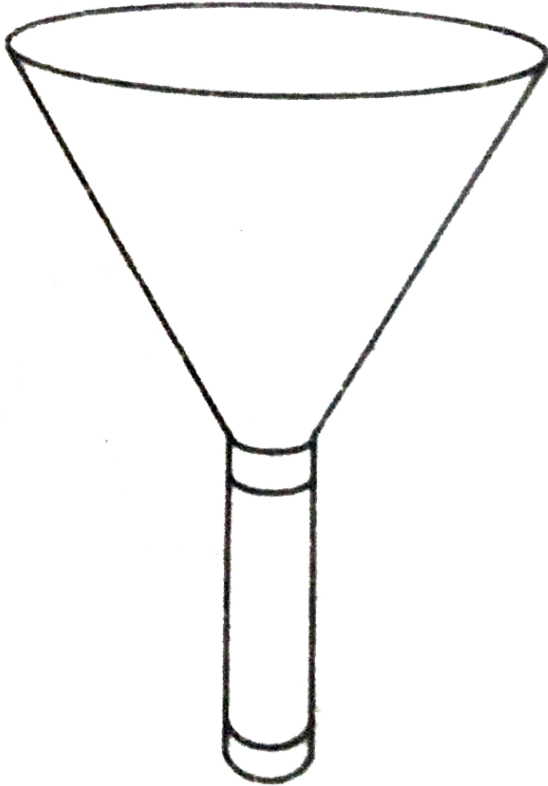B. frustum of a cone and a hemisphere

C. a cone and a hemisphere

D. a cone and a hemisphere

Answer: B

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2. A funnel is the combination of

Funnel

A. a cylinder and a cone

B. a cylinder and a hemisphere

C. a cylinder and frustum of a cone

D. a cone and a hemisphere

Answer: C

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3. A surahi is a combination of

A. a sphere and a cylinder

B. a hemisphere and a cylinder
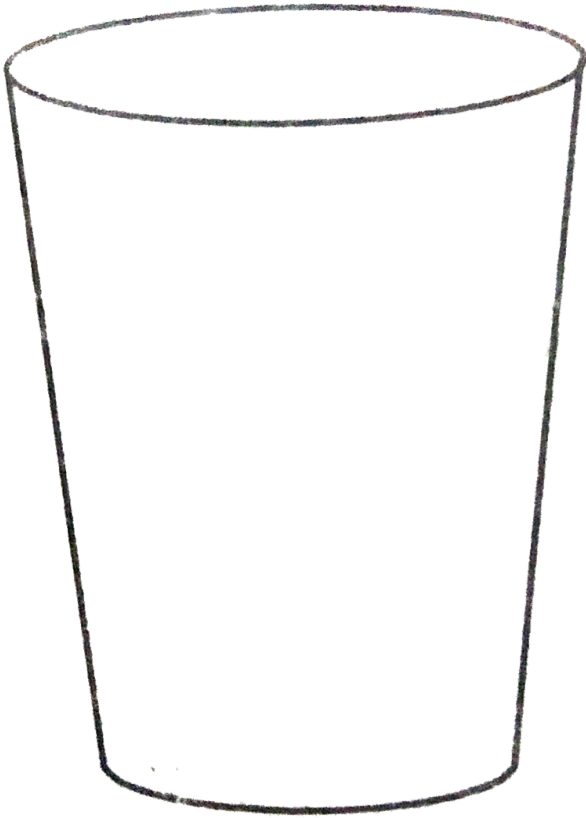
C. a cylinder and a cone

D. two hemispheres

Answer: A

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4. The shape of a glass (tumbler) is usually in the form of
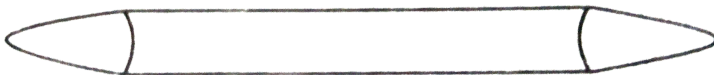
Glass

A. a cylinder

B. frustum of a cone

C. a cone

D. a sphere

Answer: B

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

a combination of

Gilli

A. a cone and a cylinder

B. two cylinders
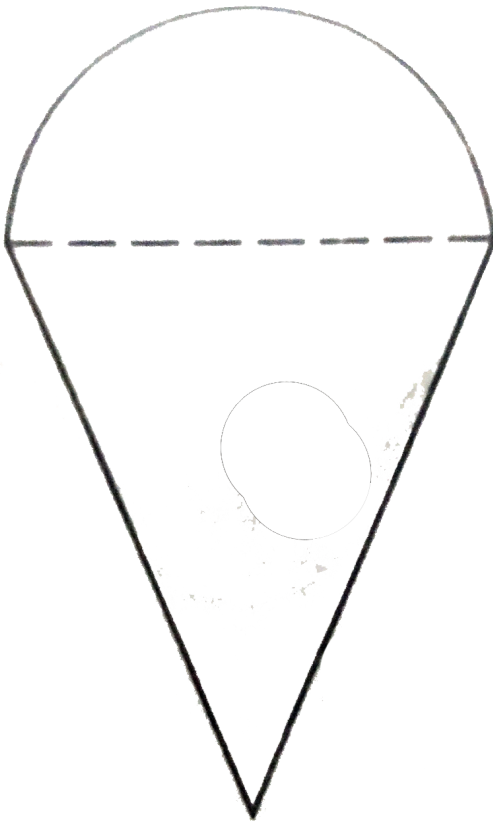
C. two cones and a cylinder

D. two cylinders and a cone

Answer: C

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6. A plumbline (sahul) is the combination of

Plumbline

A. a hemisphere and a cone

B. a cylinder and a cone

C. a cylinder and frustum of a cone

D. a cylinder and a sphere
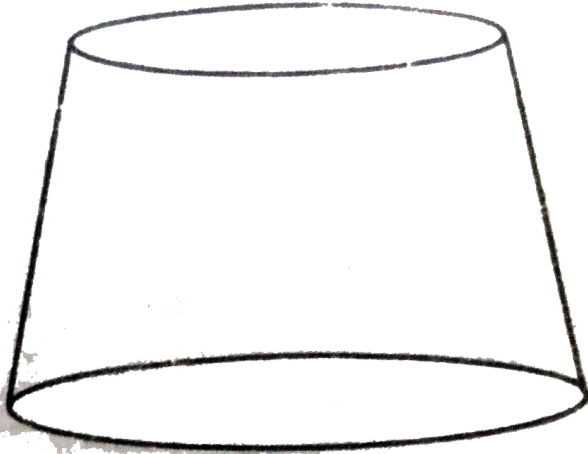
Answer: A

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7. A cone is cut by a plane parallel to its base and the upper part is removed . The part that

is left over is called

A. a cone

B. a sphere

C. a cylinder

D. frustum of a cone

Answer: D

8. Match the following columns:

Column I	Column II
(a) A solid metallic sphere of radius 8 cm is melted and the material is used to make solid right cones with height 4 cm and radius of the base 8 cm. How many cones are formed?	(p) 18
(b) A 20-m-deep well with diameter 14 m is dug up and the earth from digging is evenly spread out to form a platform 44 m by 14 m. The height of the platform is ...... m.	(q) 8
(c) A sphere of radius 6 cm is melted and recast into the shape of a cylinder of radius 4 cm. Then, the height of the cylinder is ...... cm.	(r) 16 : 9
(d) The volumes of two spheres are in the ratio 64 : 27. The ratio of their surface areas is	(s) 5

9. Match the following columns:

Column I	Column II
(a) The radii of the circular ends of a bucket in the form of frustum of a cone of height 30 cm are 20 cm and 10 cm respectively. The capacity of the bucket is ...... cm^3. [Take $\pi = \frac{22}{7}$·]	(p) 2418π

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10. Which of the following is correct

Assertion (A)	Reason (R)
If the radii of the circular ends of a bucket 24 cm high are 15 cm and 5 cm respectively, then the surface area of the bucket is 545π cm^2.	If the radii of the circular ends of the frustum of a cone are R and r respectively and its height is h, then its surface area is $\pi\{R^2 + r^2 + l(R - r)\}$, where $l^2 = h^2 + (R + r)^2$.

A. Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A).

B. Both Assertion (A) and Reason (R) are true but Reason (R) is not a correct explanation of Assertion (A).

C. Assertion (A) is true and Reason (R) is false.

D. Assertion (A) is false and Reason (R) is true.

Answer:

Assertion (A)	Reason (R)
A hemisphere of radius 7 cm is to be painted outside on the surface. The total cost of painting at ₹ 5 per cm² is ₹ 2300.	The total surface volume of a hemisphere is $3\pi r^2$.

11.

The correct answer a/b/c/d

A. Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A).

B. Both Assertion (A) and Reason (R) are true but Reason (R) is not a correct explanation of Assertion (A).

C. Assertion (A) is true and Reason (R) is false.

D. Assertion (A) is false and Reason (R) is true.

Answer: D

Assertion (A)	Reason (R)
The number of coins 1.75 cm in diameter and 2 mm thick from a melted cuboid (10 cm × 5.5 cm × 3.5 cm) is 400.	Volume of a cylinder of base radius r and height h is given by $V = (\pi r^2 h)$ cubic units. And, volume of a cuboid $= (l \times b \times h)$ cubic units.

12.

The correct answer a/b/c/d

A. Both Assertion (A) and Reason (R) are

true and Reason (R) is a correct

explanation of Assertion (A).

B. Both Assertion (A) and Reason (R) are

true but Reason (R) is not a correct

explanation of Assertion (A).

C. Assertion (A) is true and Reason (R) is

false.

D. Assertion (A) is false and Reason (R) is

true.

Answer: A

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Assertion (A)	Reason (R)
If the volumes of two spheres are in the ratio 27 : 8 then their surface areas are in the ratio 3 : 2.	Volume of a sphere $= \frac{4}{3}\pi R^3$. Surface area of a sphere $= 4\pi R^2$.

13.

The correct answer a/b/c/d

A. Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A).

B. Both Assertion (A) and Reason (R) are true but Reason (R) is not a correct explanation of Assertion (A).

C. Assertion (A) is true and Reason (R) is false.

D. Assertion (A) is false and Reason (R) is true.

Answer: D

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Assertion (A)	Reason (R)
The curved surface volume of a cone of base radius 3 cm and height 4 cm is (15π) cm^2.	Volume of a cone $= \pi r^2 h$.

14.

The correct answer a/b/c/d

    A. Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A).

B. Both Assertion (A) and Reason (R) are true but Reason (R) is not a correct explanation of Assertion (A).

C. Assertion (A) is true and Reason (R) is false.

D. Assertion (A) is false and Reason (R) is true.

Answer: C

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