MATHS

BOOKS - CALCUTTA BOOK HOUSE MATHS (BENGALI ENGLISH)

PROBLEMS RELATED TO DIFFERENT SOLIDS AND OBJECTS

Examples Very Short Answer Type Questions Vsa Multiple Choice Questions

1. If a solid right circular cone of height r unit is made by melting a solid sphere of radius r unit . Then the radius of the base of the cone will be

    A. 2r unit

    B. 3r unit

    C. r unit

    D. 4r unit

Answer: A

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2. The radius of a right circular cylinder is r unit and height is 2r units . The diameter of the largest sphere that can be put into the cylinder will be

A. r unit

B. 2r unit

C. $\dfrac{r}{2}$ unit

D. 4r unit

Answer: B

3. The volume of the largest solid cone that can be cut off from a solid hemisphere will be

   A. $4\pi r^3$ cubic - unit

   B. $3\pi r^3$ cubic - unit

   C. $\dfrac{\pi r^3}{4}$ cubic - unit

   D. $\dfrac{\pi r^3}{3}$ cubic - unit

Answer: D

4. The radius of the largest sphere that can be cut off from a solid cube of side x unit each will be

    A. x unit

    B. 2x unit

    C. $\dfrac{x}{2}$ unit

    D. 4x unit

Answer: C

5. The height of the water - level when the water of a right circular cone - shaped bottle of radius r unit and of height h unit is poured into a right circular cylinder shaped pot of radius mr unit will be

A. $\dfrac{h}{2}m^2$ unit

B. $\dfrac{2h}{m}$ unit

C. $\dfrac{h}{3m^2}$ unit

D. $\dfrac{m}{2h}$ unit

Answer: C

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6. Write whether the following statements are true or false :

(i) If two solid hemisphere of same type of which the radii of bases are r unit be joined

along their bases , then the total surface area of the joint solid object is $6\pi r^2$ square - unit .

7. Write whether the following statements are true or false :

(ii) The radius of base , height and slant height of a solid right circular cone are r unit h unit and l unit respectively . The base of the cone is joint along the base of solid right circular cylinder. If the radii of the bases and heights

of the cylinder and of the cone be equal , then the total surface area of the joint solid object will be $(\pi r l + 2\pi r h + 2\pi r^2)$ sq - unit

8. The radii of bases of a solid right circular cylinder and of two hemispheres are equal . If the two hemisphere be joined with two end - planes of the cylinder , then the total surface area of the new solid object = (the curved surface area of the one of the hemispheres) +

(curved surface area of the ....) + (the curved surface area of the other hemisphere).

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9. The shape of a pencil with its one end cut is the coordination of a right circular cone and a right circular . . . .

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10. If a solid sphere is melted to make a solid circular cylinder , then the volumes of the sphere and the cylinder are . . . .

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11. If a solid sphere of radius r unit be melted to make a solid right circular cone of height r - unit , then find the radius of the base of the cone .

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12. If the radii and volumes of a solid right circular cone and a solid sphere be equal, then what will be the ratio of the length of diameter of the sphere and the height of the cone ?

13. The shape of the lower part of a solid object is like a hemisphere and the upper part like a right circular cone . If the surface area of

the two parts be equal , then find the ratio of the length of radius and height of the cone .

14. The length of radius of base of a solid right circular cone is equal to the length of radius of a solid sphere . If the volume of the sphere is 2 times the volume of the cone , then find the ratio of the height and radius of base of the cone .

15. If a right circular cone of height 15 cm and of diameter 30 cm is made from a wooden sphere of radius 15 cm , then percent of wood will be lost ?

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16. How many part of a rectangular parallelopiped type hole of length , breadth and depth 48 cm , 16.5 cm and 4 cm respectively should be stuffed with the soil

obtained by digging a right circular conical tunnel of diameter 4 meter and of length 56 metres ?

17. What will be the ratio of the diameter of the sphere and the height of a cylinder when the volumes of the sphere and the right circular cylinder are equal , given that the radii of the sphere and the cylinder are equal ?

18. The ratio of the radii of a right circular cylinder cone is 3: 4 and the ratio of their heights is 2:3 Then find the ratio of the volumes of them

19. How many spherical bullets of diameter 4 cm should be got fro a cube of edges 44 cm ?

20. If the curved surface areas of a sphere and a right circular cylinder both of same radii be equal , then what will be the ratio of their volumes ?

21. There is a solid iron - pillar in front of Anil's house , the lower part of which is of type of right circular cylinder and the upper part is of type of a right circular cone . The radii of their

diameter of bases is 20 cm . If the height of the cylindricalpart be 2.8 metres and that of the conical part be 42 cm and if the weight of 1 cc iron be 7.5 gm , then what will be the weight of the pilar ?

22. There is some water in a right circular cylindrical pot of diameter 24 cm . How much the height of water - level will be increased if 60 solid conical iron piece of diameter 6 cm

and of height 4 cm each are completely immersed into that water ?

23. The ratio of the curved surfaces areas of a solid right circular cone and of a right circular cylinder both of same radius of base and of same height is 5 : 8 . Then find the ratio of their radius of base and height .

24. The radius of cross - section of a right circular rod is 3.2 dcm . The rod is melted to make 21 solid spheres . If the rdius of each sphere be 8 cm , then what will be the length of the rod ?

25. How many solid spheres of diameter 2.1 dcm each can be made by melting a solid rectangular parallelopiped copper piece of length 6.6 dcm , of breadth 4.2 dcm and of

thickness 1.4 dcm ? How many cubic - dcm metal will possess in each sphere ?

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26. The radius of base of a solid right circular iron - rod is 32 cm and the length of the rod is 35 cm . How many solid right circular cone of radius of base 8 cm and of height 28 cm can be made by melting this rod ?

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27. The external radius of a hollow sphere of thickness 1 cm, made of lead - plate is 6 cm If a solid right circular rod of radius 2 cm is made by melting this hollow sphere , then what will be the length of the rod ?

28. What will be the ratio of the volumes of a solid cone , a solid hemisphere and a solid cylinder when their radii of bases and heights are equal ?

29. The upper part of a solid right circular cylindrical pillar is a hemisphere . What will be the volume of the pillar it the radius of base of it is 2 metres and its total length is 10 metres ?

30. The lower part of a tent is of shape of a right circular cylinder , the height of which is 3.5 metres . The upper part of the the tent is of a shape of a right circular cone . If the total height of the tent be 9.5 metre and it its diameter of base be 5 metre , then how much quantity of tarpailin will be required to make 14 such tents ?

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31. A conical flask of height 24 cm is full of water . If this water is poured into another cylindrical flask of radius half of the conical flask , then how much water - level of the cylindrical flask will be raised ?

32. One part of an iron - pillar is cylindrical and the rest part is conical . The radii of the cylindrical and conical part 8 cm and their

heights are 240 cm and 36 cm respectively , If the weight of 1 cc iron be 7.8 gm , what will be the total weight of the pillar ?

33. Water flows at a speed of 10 m per minute through a right circular pipe of diameter 5 mm . In how much time a tank of conical shape having diameter 40 cm and depth 24 cm will be fulfilled completely by this pipe ?

34. A pot conical shaped , the radius and height of which is 6 cm and 8 cm respectively , is fulfilled with water of this pot in such a way that it just touches the two sides of the pot . So , how many part of the water of the pot will over flow ?

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35. The lower part of a tent is a right circular cylinder of radius 14 metres and its upper part

is a right circular cone . If the height of the cylindrical part is 3 metre and the total height of the per square - metre

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36. The radii of the two ends of a pail of height 24 cm are 15 cm and 5 cm . Find the volume of the pail .

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37. A hemisphere of internal diameter 36 cm is filled with water . If this water is poured into right circular bottles of radius 3 cm and of height 6 cm , then how many bottles will be needed ?

38. The ratio of the volumes of a cylinder and a sphere is 1 : 3 and the ratio of the radii of the base of the cylinder and of the sphere is 1: 3

and If the sum of the height and radius of base of the cylinder is 78 cm , then what will be the height of the cylinder ?

39. The total surface area of a solid hemisphere is 1848 sq. cm. A solid right circular cone is made by melting this hemisphere. If the radius of base of the cone is equal to the radius of the hemisphere , then what will be the height of the cone ?

40. Half of a tank of length 5 metre , breadth 4 metre and height 2.2 metre , is filled with water How many iron - bullets of radius 5 cm each should be completely immersed into the water of the tank so that the tank full to the brim ?

41. Half of a tank of length 21 dcm , breadth 11 dcm and depth 6 dcm and depth 6 dcm is full of water . If 100 spheres made of iron and of diameter 21 cm each are fully immeresed into this water of tank , then how many dcm of the water - level of the tank will be raised ?

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42. The cross - setion of a rectangular parallelopiped wooden log of length 2 metre

is square - shaped and each of its side is of length 14 dcm . If the rectangular log is reduced to a right circular log by loosing smallest amount of wood , then how much cubic - metre of wood the log will posses and how cubic - metre of wood will be lost ?

43. What will be the ratio of the volume of a sphere and a cube if the surface areas of the sphere and the cube are equal ?

44. A right circular cone is made by cutting a cubical wooden block of side 9 cm each , then what will be the greatest volume of the cone ?

Exercise 5 Multiple Choice Question

1. If a sphere is made by melting a solid right circular cylinder of radius 2x cm and height x

cm , then the radius of the sphere will be

A. $\sqrt[3]{3x}$ cm

B. $\sqrt[3]{3x}$ cm

C. x cm

D. 2x cm

Answer: B

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2. How many number of smaller tin - jars will be required if the kerosene of a large cylindrical drum of diameter 35 dcm and of height 24 dcm is poure into some smaller tin - jars of length 25 cm breadth 22 cm and height 35 cm each ?

    A. 120

    B. 600

    C. 1020

    D. 1200

Answer: D

3. How many coins of diameter 1.5 cm and of thickness 0.2 cm can be made by melting a metal right circular cylinder of diameter 4.5 cm and height 10 cm ?

   A. 430

   B. 440

   C. 450

D. 460

Answer: C

4. The radius of a right circular cone and its height is r unit . The volume of the sphere of diameter equal to the stant height of the cone will be

A. $\dfrac{2r^3}{3}\pi$ cu - unit

B. $\dfrac{\sqrt{2r^3}}{3}\pi$ cu - point

C. $\dfrac{4r^3}{3}\pi$ cu - unit

D. $\dfrac{r^3}{3}$ cu - unit

Answer: B

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5. The radius of a cone is r unit and its slant height is l unit . If the curved surface area of the cone be equal to the total surface area of

a sphere of same radius , then the height of the cone will be

A. $\sqrt{15}$ r unit

B. $\sqrt{12}$ r unit

C. $\sqrt{10}$ r unit

D. $\sqrt{17}$ r unit

Answer: A

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Write True Or False

1. A right circular cone of radius x cm and of height h cm is placed on a hemisphere . Then the total surface area of the newly constructed solid object will be $\pi r\left(\sqrt{h^2 + r^2} + 2r\right)$ sq- cm

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2. If a hemisphere of radius r unit is placed on one end of a right circular cyllinder of radius r unit and height h unit and a right circular

cone of radius r unit and height h unit on the other end of the cylinder , then the total surface area of the new solid object will be $\pi r \left(2h + 2r + \sqrt{h^2 + r^2} \right)$ sq - unit

Fill In The Blanks

1. The ratio of the volumes of a right circular cone made by melting a sphere will be ... ...

2. The radius and height of a cone is r unit . The total surface area of a sphere area of a sphere of diameter equal to the slant height of the will be . . . . sq - unit

Short Answer Type Questions Sa

1. The radius of base and height of a right circular cone are equal . If the cone be melted to make a right circular cylinder of same radius , then what will be the ratio of the height of cylinder and the slant height of the cone ?

2. The radius of base and the height of a right circular are 3 cm and 5 cm respectively . How

many cones of radius 1 milimetre and of height 1 cm can be made by melting the cyllinder ?

3. The height and radius of base of a right circular cylinder are equal . A equal circular cone of same radius is made by melting this cylnder , if the volume of the cone is $\dfrac{2\sqrt{2}}{3}$ times the volume of cylinder , then how many

times the slant height of the cone will be than

the radius ?

4. What will be the ratio of the volumes of a

sphere and a cube if their total surface areas

are equal ?

5. A right circular pot can posses water 120 times the water 120 times the water that a hemispherical basin of diameter 150 cm can passes . If the height of the cylinder be 15 cm , then what will be its diameter ?

6. 10 balls of radius 5 cm are arranged consecutively in a right circular cylindrical box of radius 5 cm with a cover. IF the ball placed

at the top touches the cover , then what will be the volume of the empty space of box ?

7. What will be the greatest volume of the sphere that can be cut from a cube of side 3 cm each ?

8. What will be the ratio of the volume of the greatest cone and the greatest sphere that can be placed into two cubes of equal sides separately ?

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Long Answer Type Questions La

1. A conical pot of internal radius 5 cm and height 24 cm is filled with water . It this water

is poured into a right cylindrical pot of radius 10 cm , then what will be the height of water - level into the pot ?

2. If a right circular wooden piece of equal height and radius be cut off from a right circular cylindrical wooden block of height 10 cm and raadius 6 cm , then what will be the volume of the rest wooden block ?

3. A part of an iron -pillar is a right circular cylindrical shaped and the rest part is a right circular conical shaped . The radius of each part of the pillar is 6 cm and the heights of the first part , i.e , of the cylindrical part and the second part , i.e o fthe conical part are 140 cm and 35 cm respectively . If the weight of 1 cc iron be 5.2 gm , then what will be the weight of the total pillar ?

4. A right circular cone is made by melting a piece of metal right cylinder of radius 8 cm and height 2 cm . If the height of the cone is 3 times the height of the cylinder , then what will be the curved surface area of the cone ?

5. The lower part of a radius tent is a right circular cylinder and its upper part is a right circular cone . If the diameter of base of the tent be 105 metre , the height of the

cylindrical part is 3 metre and the slant height of the conical part be 53 metre , then what quantity of canvas will be needed to make the tent ?

6. What will be the volume of an open conical cup made by bending a semicular metal plate of diameter 28 cm ?

7. The radii of the two ends of a pail of height 45 cm ar 28 cm and 7 cm respectively . What will be the volume and the total surface area of the pail ?

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8. How many centimetres the water - level of a partly filled cylindrical pot of diameter 12 cm will be rise if sphere of diameter 6 cm is immeresed in it ?

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9. The height of a right circular cylindrical icecream box of radius 6 cm is 15 cm . This icecream is distributed among 10 children by 10 equal eight circular conical pot in such a way that after distribution the upper part of the pot becomes a semi - circle . If the height of the cones be 4 times of the radius of the base , then what will be the radius of the conical pots ?

10. If the height of the cylinder is 9 cm and its radius of base is 7 cm , then what will be the volume of the cylinder ?

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11. Both ends of right circular cylindrical tank are semicircular . If diameter of the tank be 1.4 metre and length be 5 metre , then what will be the expenditure of colouring the external

surface of the tank at the rate of Rs 10 per square - metre ?

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12. A sphere is inscribed in a right circular cylinder . Prove that the total surface area of the sphere is equal to the curved surface area of the cylinder .

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13. A right circular cone of same radius is made by melting a right circular cylindrical piece of metal of radius 2 metre and height 3.5 metre . Find the height of the cone .

14. The internal and external diametres of a hollow sphere are 6 cm and 10 cm respectively / If a right circular cylinder of height $2\frac{2}{3}$ cm is

ade by melting this sphere, then will be the dimeter of the cylinder ?

15. The radius of base and height of a right circular cones are 14 cm and 20 cm respectively . What will be the curved surface area of the greatest right circular cylinder inscribed into the cone ?

16. 6 equal spheres are made by melting a iron - rod of radius 8 cm . If the radius of each of the spheres be equal to the radius of the cross - section of the rod , then will be the length of the rod ?

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17. The length , breadth and height of a rectangular paralelopiped are 11 cm , 9 cm and 6 cm respectively . How many coins of

diameter 3 cm and height $\dfrac{1}{4}$ cm can be made from this rectangular paralelopiped ?

18. The volume of a cube is $8a^3$, the diameter of a sphere is equal to the height of the cube . What will be thecolume of the sphere ?

19. The diagonal of the base of a cube is 2 decimetre . At least how many parts , i.e how many cubic - dcm of the cube should be cut off to reduce the cube into a sphere ?

20. A solid sphere of diameter 6 dcm is reduced to a pipe of length 4 dcm . If the external diameter of the pipe be 10 dcm , then what will be the thickness of it ?