MATHS

BOOKS - CBSE COMPLEMENTARY MATERIAL MATHS (HINGLISH)

SURFACE AREA AND VOLUME

Very Short Answer Type Questions Match The Following

1. Match the following

Column I	Column II
(a) Surface area of a sphere	(i) $2\pi r^2 h$
(b) Total surface area of a cone	(ii) $\frac{1}{2}\pi r^2 h$
(c) Volume of a cuboid	(iii) $2\pi r(r+h)$
(d) Volume of hemisphere	(iv) $\frac{1}{3}\pi h(r^2+R^2+rR)$
(e) Curved surface area of a cone	(v) $\pi r\ (r+1)$
(f) Total surface area of hemisphere	(vi) $l \times b \times h$
(g) Curved surface area of a cylinder	(vii) $\frac{2}{3}\pi r^3$
(h) Volume of a cone	(viii) πrl
(i) Total surface area of a cylinder	(ix) $3\ \pi r^2$
(j) Volume of a frustum of a cone	(x) $4\pi r^2$

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Very Short Answer Type Questions Fill In The Blanks

1. The total surface area of cuboid of dimension $a \times a \times b$ is._____.

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2. The volume of right circular cylinder of base radius r and height 2r is_____.

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3. The total surface area of a cylinder of base radius r and height h is_____.

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4. The curved surface area of a cone of base radius r and height h is_____.

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5. If the height of a cone is equal to diameter of its base, the volume of cone is_____.

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6. The total surface area of a hemisphere of radius r is πr^2 (b) $2\pi r^2$ (c) $3\pi r^2$ (d) $4\pi r^2$

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7. The lateral surface area of a hollow cylinder of outer radius R, inner radius r and height h is_____.

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8. If the radius of a sphere is doubled, its volume becomes _____ times the volume of original sphere.

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9. If the radius of a sphere is halved, its volume becomes_____times the volume of original sphere.

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Very Short Answer Type Questions True Or False

1. Two identical solid hemisphers of equal base radiu r cm are stuck together along their bases. The total surface area of the combination is $6\pi r^2$.

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2. State True or False:

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

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3. Asolid cone of radius r and height h is placed over a solid cylinder having same base radius and height as that of a cone,. The total surface area of the combined solid is $\pi\left[\sqrt{r^2+h^2}+3r+2h\right]$

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4. State True or False:

A solid ball is exactly fitted inside the cubical box of side a. The volume of the ball is $\frac{4}{3}\pi a^2$

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

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Very Short Answer Type Questions Choose The Correct Answer

1. The total surface area of a solid hemisphere of radius r is

A. πr^2

B. $2\pi r^2$

C. $3\pi r^2$

D. $4\pi r^2$

Answer: C

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2. The volume and the surface area of a sphere are numerically equal, then the radius of sphere is

A. 0 units

B. 1 units

C. 2 units

D. 3 units

Answer: D

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3. A cylinder, a cone and a hemisphere are of equal base and have the same height, then the ratio of their volumes is

A. $1:2:3$

B. $2:1:3$

C. $3:1:2$

D. $3:2:1$

Answer: C

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4. A solid sphere of radius r is melted and cast into the shape of a solid cone of height r , the radius of the base of the cone is $2r$ (b) $3r$ (c) r (d) $4r$

A. 2r

B. r

C. 4r

D. 3r

Answer: A

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5. Three solid spheres of diameters 6 cm, 8 cm and 10 cm are melted to form a single solid sphere. The diameter of the new sphere is

A. 6cm

B. 4.5 cm

C. 3cm

D. 12cm

Answer: D

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6. The radii of the ends of a frustum of a cone 40 cm high are 38 cm and 8 cm. The slant height of the frustum of cone is

A. 50 cm

B. $10\sqrt{7}cm$

C. $60.96cm$

D. $4\sqrt{2}$

Answer: A

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

A. 12cm

B. 14cm

C. 15cm

D. 18cm

Answer: B

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

A. 21cm

B. 23cm

C. 25cm

D. 19cm

Answer: A

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9. A shuttle cock used for playing badminton has the shape of the combintion of

A. A cylinder and a sphere

B. a cylinder and a hemisphere

C. a sphere and a cone

D. frustum of a cone and hemsphere

Answer: D

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

A. $4950cm^2$

B. $4951cm^2$

C. $4952cm^2$

D. $4953cm^2$

Answer: A

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Very Short Answer Type Questions

1. What geometrical shapes is a "FUNNEL" combination of?

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2. What geometrical shapes is a cylindrical "PENCIL" sharped at one edge combination of?

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3. What geometrical 3-D shapes is a “GLASS (tumbler)”?

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4. What geometrical shapes is a “GILLI” in gilli-danda game combination of?

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5. A solid shape is converted from one form to another. What is the change in its volume?

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6. What cross-section is made by a cone when it is cut parallel to its base?

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7. Find total surface area of a solid hemi-sphere of radius 7cm.

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8. Volume of two spheres is in the ratio 64 : 125. Find the ratio of their surface areas.

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9. A cylinder and a cone are of same base radius and of same height. Find the ratio of the volumes of cylinder to that of the cone.

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10. A solid sphere of radius r is melted and recast into the shape of a solid cone of height r. Find radius of the base of the cone.

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11. If the volume of a cube is $1331cm^3$, then find the length of its edge.

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Short Answer Type Question Type I

1. How many cubes of side 2 cm can be cut from a cuboid measuring (16cm x 12cm x 10cm).

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2. Find the height of largest right circular cone that can be cut out of a cube whose volume is $729cm^3$

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3. Two identical cubes each of volume $64cm^3$ are joined together end to end. What is the surface area of the resulting cuboid?

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4. Twelve solid spheres of the same sizes are made by melting a solid metallic cylinder of base diameter 2 cm and height 16cm. Find the radius of each sphere.

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5. The diameters of the two circular ends of the bucket are 44 cm and 24 cm. The height of the bucket is 35cm. Find the volume of the bucket.

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Short Answer Type Question Type Ii

1. A bucket is in the form of a frustum of a cone and hold 28.490 litres of water. The radii of the top and bottom are 28 cm and 21 cm respectively. Find the height of the bucket.

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2. Three cubes of a metal whose edge are in the ratio 3:4:5 are melted and converted into a single cube whose diagonal is $12\sqrt{3}$ cm. Find the edge of three cubes

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3. Find the depth of a cylindrical tank of radius 10.5 cm, if its capacity is equal to that of a rectangular tank of size 15 cm x 11 cm x 10.5 cm.

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4. A cone of radius 8cm and height 12cm is divided into two parts by a plane through the mid-point of its axis parallel to its base. Find the ratio of the volumes of the two parts.

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5. A petrol tank is a cylinder of base diameter 28cm and length 24cm filted with conical ends

each of axis length 9cm. Determine the capacity of the tank.

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6. Water in a canal, 6 m wide and 1.5 m deep, is flowing with a speed of 10 km/h. How much area will it irrigate in 30 minutes, if 8 cm of standing water is needed?

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7. A solid is in the form of a cylinder with hemispherical ends. The total height of the solid is 20 cm and the diameter of the cylinder is 7 cm. Find the total volume of the solid. (Use $F = \frac{22}{7}$)

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8. 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.

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9. A cone of height 24 cm and radius of base 6 cm is made up of modeling clay, A child reshapes it in the form of a sphere. Find the radius of the sphere and hence find the surface area of this sphere.

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10. A farmer connects a pipe of internal diameter 20 cm from a canal into a cylindrical tank in her 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?

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11. 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

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12. A girl empties a cylindrical bucket full of sand, of base radius 18 cm and height 32 cm on the floor to form a conical heap of sand. If the height of this conical heap is 24 cm, then find its slant height correct to one place of decimal.

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13. Water is flowing at the rate of 5 km/hour through a pipe of diameter 14 cm into a tank with rectangular base which is 50 m long and 44 m wide. Find the time in which the level of water tank rises by 7 cm. (Use $\pi = \frac{22}{7}$)

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14. An agriculture field is in the form of a rectangle of length 20m width 14m. A 10m

deep well of diameter 7m is dug in a corner of the field and the earth taken out of the well is spread evenly over the remaining part of the field. Find the rise in its level.

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Long Answer Type Questions

1. A bucket is in form of a frustum of a cone with a copacity of $12308.8cm^3$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 $\pi = 3.14$.]

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2. A solid iron pole consists of a cylinder of height 220 cm and base diameter 24 cm, which is surmounted by another cylinder of height 60 cm and radius 8 cm. Find the mass of the pole, given that $1cm^3$ of iron has approximately 8 gm mass. (Use $\prod$ = 3.14)

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3. 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 four times the radius of its base, find the radius of the ice-cream cone.

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4. A container opened at the top and made up of a meta! sheet, is in the form of a frustum of a cone of height 16 cm with radii of its lower and upper ends as 8 cm and 20 cm respectively. Find the cost of milk which can completely fill the container, at the rate of ? 50 per litre. Also find the cost of meta! sheet used to make the container, if it costs Rs. 10 per $100cm^2$? (Take π = 3.14).

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5. An open metallic bucket is in the shape of the frustum of the cone. If the diameters of the two circular ends of the bucket are 45 cm and 25 cm and the vertical height of the bucket is 24cm, find the area of the metallic sheet used to make the bucket. Also find the volume of water it an hold. (Use $\pi = \frac{22}{7}$)

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6. In Fig. 16.74, from the 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. $\left(Use\ \pi = 22/7\ and\ \sqrt{5} = 2.236\right)$ (FIGURE)

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7. 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 $166\frac{5}{6}cm^3$. 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

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8. 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 .

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9. 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 $\pi = 22/7$)

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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 $\pi = \frac{22}{7}$]

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11. 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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12. The difference between the outer and inner curved surface areas of a hollow right circular cylinder 14 cm long is $88\ cm^2$. If the volume of metal used in making the cylinder is $176\ cm^3$, find the outer and inner diameters of the cylinder. (Use $\pi = 22/7$)

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Practice Test Section A

1. The total surface area of a solid hemisphere of radius r is

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2. Which two geometrical shapes are obtained by cutting a cone parallel to its base?

A. a cylinder and a cone

B. a cone and a hemisphere

C. a sphere and a cone

D. frustum of a cone and a cone

Answer:

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3. 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. 4.2

B. 2.1

C. 8.4

D. 1.05

Answer:

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4. The volume of a cube is $1000 cm^3$. Find its side.

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Practice Test Section B

1. The radii of the ends of a frustum of a cone 45 cm high are 28 cm and respectively, find the volume.

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2. A solid sphere of radius 10.5 cm is melted and recast into smaller solid cones, each of radius 3.5 cm and height 3 cm. Find the number of cones so formed.

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3. A cube and a sphere have equal total surface area. Find the ratio of the volume of sphere and cube.

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Practice Test Section C

1. A vessel is in the form of an inverted cone. Its height is 8 cm and the radius of its top, which is open, is 5 cm. It is filled with water up

to the brim. When lead shots, each of which is a sphere of radius 0.5 cm are dropped into the vessel, on

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2. A large right circular cone is made out of a solid cube edge 9 cm. Find the volume of the remaining solid.

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Practice Test Section D

1. 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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