SURFACE AREAS AND VOLUMES

Q.1) Find the volume of water in cubic metres that will fall on 2 hectares of ground if 5 cm of rainfall takes place.

(A) 1400 m^3 (B) 1000 m^3

(C) 1200 m^3 (D) 1100 m^3

Q.2) The sum of the radius of the base and the height of a solid cylinder is 12 cm, Find its circumference, if its total surface area is 540 cm^2.

(A) 45 cm (B) 40 cm

(C) 35 cm (D) 42 cm

Q.3) Volumes of two solid spheres are in the ratio 125: 64. Determine their radii, if the sum of their radii is 45 cm.

(A) 25 , 20 (B) 15, 30

(C) 35, 10 (D) 40, 5

Q.4) Three cubes of same metal whose edges are 6 cm, 8 cm and 10 cm are melted and formed into a signal cube. Find the diagonal of the larger cube formed.

(A) $12\sqrt{3}$ cm (B) $12\sqrt{2}$ cm

(C) 13 cm (D) 17 cm

Q.5) The height and radius of the cone of the cone of which the frustum is a part are , h_1 and r_1 respectively. If h_2 and r_2 are the height and radius of the smaller base of the frustum respectively and $h_2:h_1$ is 1:2, determine $r_2:r_1$.

(A) 1 : 3 (B) 1 : 4

(C) 2 : 1 (D) 1 : 2

Q.6) A RECTANGULAR SHEET OF PAPER 44 CM ×18 CM IS ROLLED ALONG ITS LENGTH AND A CYLINDER IS FORMED. THE VOLUME THE CYLINDER SO FORMED IS EQUAL TO ($Take \pi = \frac{22}{7}$)

(A) 2772 CM^3 (B) 2505 CM^3

(C) 2460 CM^3 (D) 2672 CM^3

Q.7) A HOLLOW CYLINDRICAL PIPE IS 21 CM LONG. IF ITS OUTER AND INNER DIAMETERS ARE 10 CM AND 6 CM RESPECTIVELY, THEN THE VOLUME OF THE METAL USED IN MAKING THE PIPE IS ($Take \pi = \frac{22}{7}$)

(A) 1048 CM^3 (B) 1056 CM^3

(C) 1060 CM^3 (D) 1064 CM^3

Q.8) A CONICAL TENT WITH BASE-RADIUS 7 M AND HEIGHT 24 M IS MADE FROM 5 M WIDE CANVAS. THE LENGTH OF THE CANVAS USED IS ($Take \pi = \frac{22}{7}$)

(A) 100 M (B) 105 M

(C) 110 M (D) 115 M

Q.9) IF THE DIAMETER OF A METALLIC SPHERE IS 6 CM, IT MELTED AND A WIRE OF DIAMETER 0.2 CM IS DRAWN, THEN THE LENGTH OF THE WIRE MADE SHALL BE

(A) 24 M (B) 28 M

(C) 32 M (D) 36 M

Q.10) A TOY IS IN THE FORM OF A CONE MOUNTED ON A HEMISPHERE WITH SAME RADIUS. THE DIAMETER OF THE BASE OF THE CONICAL PORTION IS 6 CM

AND ITS HEIGHT IS 4 CM. THE SURFACE AREA OF THE TOY IS

(A) 36π CM^2 (B) 33π CM^2

(C) 35π CM^2 (D) 24π CM^2

Q.11) A FRUSTUM OF A RIGHT CIRCULAR CONE IS OF HEIGHT 16 CM WITH RADII OF ITS ENDS AS 8 CM AND 20 CM HAS LATERAL SURFACE AREA EQUAL TO

(A) 540π CM^2 (B) 580π CM^2

(C) 560π CM^2 (D) 680π CM^2

Q.12) One cubic metre piece of copper is melted and recast in to a square cross-section bar, 36 m long. An exact cube is cut off from this. If cubic metre of copper cost Rs. 108, then the cost of this cube is :

(A) 50 paisa (B) 75 paisa

(C) One paisa (D) 1.50 paisa

Q.13) In a shower 10 cm of rain fall. The volume of water that falls on 1.5 hectares of ground is :

(A) 1500 m^3 (B) 1400 m^3

(C) 1200 m^3 (D) 1000 m^3

Q.14) The slant height of a conical tent made of canvas is $\frac{14}{3}$ m. The radius of tent is 2.5 m. The width of the canvas is 1.25 tube. If the height of the tube is 15 cm, then the diameter of the tube (in Rs.) is :

(A) 726 (B) 950

(C) 960 (D) 968

Q.15) A hemispherical basin 150 cm in diameter holds water one hundred and twenty times as much a cylindrical m. If the rate of canvas per metre is Rs. 33, then the total cost of the canvas required for the tube (in cm) is :

(A) 23 (B) 24

(C) 25 (D) 26

Q.16) If form a circular sheet of paper of radius 15 cm, a sector of 144^0 is removed and the remaining is used to make a conical surface, then the angle at the vertex will be :

(A) $\sin^{-1}\left(\frac{3}{10}\right)$ (B) $\sin^{-1}\left(\frac{6}{5}\right)$

(C) $2\sin^{-1}\left(\frac{3}{5}\right)$ (D) $2\sin^{-1}\left(\frac{4}{5}\right)$

Q.17) A cylinder is circumscribed about a hemisphere and a cone is inscribed in the cylinder so as to have its vertex at the centre of one end and the other end as its base. The volumes of the cylinder, hemisphere and the cone are respectively in the ratio of :

(A) $3:\sqrt{3}:2$ (B) 3 : 2 : 8

(C) 1 : 2 : 3 (D) 2 : 3 : 1

Q.18) A large solid sphere of diameter 15 m is melted and recast into several small spheres of diameter 3 m. What is the percentage increase in the surface area of the smaller sphere over that of the large sphere?

(A) 200 % (B) 400 %

(C) 500 % (D) Can't be determined

Q.19) In a particular country the value of diamond is directly proportional to the surface area (exposed) of the diamond. For thieves steel a cubical diamond piece and then divide equally in four parts. What is the maximum

percentage increase in the value of diamond after cutting it ?

(A) 50 % (B) 66.66 %

(C) 100 % (D) None of these

Q.20) In a factory there are two identical solid blocks of iron. When the first block is melted and recast into spheres of equal radii Y, then 14 cc of iron was left. The volumes of the solid blocks and all the spheres are in integers. What is the volume (in cm^3) of each of the large sphere of radius '2r'?

(A) 176 (B) 12π

(C) 192 (D) Data insufficient

Q.21) Initially the diameter of a balloon is 28 cm. It can explode when the diameter becomes 5/2 times of the initial diameter. Air is blown at 156 cc/s. It is knows that the shape of balloon always remains spherical. In how many seconds the balloon will explode?

(A) 1078s (B) 1368s

(C) 1087s (D) None of these

Q.22) Marbles of diameter 3 cm are dropped into a cylindrical beaker containing some water and are fully submerged. The diameter of the beaker is 12 cm. Find how many marbles have been dropped in it if the water rises by 10 cm.

(A) 20 (B) 40

(C) 80 (D) 60

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

(A) π : 6 (B) π : 3

(C) 6 : π (D) 3 : π

Q.24) A glass cylinder with diameter 20 cm has water to a height of 9 cm. A metal cube of 8 cm edge is immersed in it completely. Find the height by which water will rise in the cylinder. (Take π = 3.142)

(A) 1.6 cm (B) 1.9 cm

(C) 2.6 cm (D) 1.2 cm

Q.25) Water in a canal, 30 dm wide and 12 dm deep, is flowing with a speed of 10 km/hour. How much area will it irrigate in 30 minutes, if 8 cm of standing water is required for irrigation

(A) 22.5 hectare (B) 36 hectare

(C) 17.5 hectare (D) 11.5 hectare

Q.26) The earth dug out of a well is spread evenly all around it to form an embankment which is2mwide. Find the height of the embankment if the diameter of the well is 2 m and its depth is 20 m.

(A) 6 m (B) 3 m

(C) 2.5 m (D) 4.5 m

Q.27) A hemispherical bowl of internal diameter 36 cm contains a liquid. This liquid is to be filled in cylindrical bottles of radius 3 cm and height 6 cm. How many bottles are required to empty the bowl?

(A) 60 (B) 80

(C) 72 (D) 75

Q.28) The rain water from a roof of 22 m × 20 m drains into a cylindrical vessel having diameter of base 2 m and height 3.5 m. If the vessel is just full, find the rain falls in cm.

(A) 1.5 cm (B) 2.5 cm

(C) 3.5 cm (D) 4 cm

Q.29) A piece of metal pipe is 77 cm long with inside diameter of the section as 4 cm. If the outer diameter is 4.5 cm and the metal weighs 8 gm/cm^3, the weight of the pipe is :

(A) 2.057 kg (B) 20.57 kg

(C) 205.7 kg (D) None of these

Q.30) A glass cylinder with diameter 20 cm has water to a height of 9 cm. A metal cube of 8 cm edge is immersed in it completely. The height by which water will rise in the cylinder is (Take π =3.14)

(A) 1.6 cm (B) 2.5 cm

(C) 1 cm (D) 2.6 cm

Answer Sheet

Q.1	B	Q.11	C	Q.21	A
Q.2	A	Q.12	A	Q.22	C
Q.3	A	Q.13	A	Q.23	C
Q.4	A	Q.14	D	Q.24	A
Q.5	D	Q.15	C	Q.25	A
Q.6	A	Q.16	C	Q.26	C
Q.7	B	Q.17	B	Q.27	C
Q.8	C	Q.18	B	Q.28	B
Q.9	D	Q.19	C	Q.29	A
Q.10	B	Q.20	A	Q.30	A