### **Surface Areas and Volumes**

### QUESTIONS

1.	A parallelogram and a rhomb	us are equal in area. The diagonals of the rhombus measure 60 m 22 m.	
	If side of a parallelogram is $\frac{3}{4}$	$\frac{3}{4}$ of longer diagonals of the rhombus then altitude from the given base	
	of the parallelogram is		
	(a) 15 m	(b) 13 m	
	(c) 1233 m	(d) 14.67 m	
	(e) None of these		
2.	2. The length of the longest pole that can be put in a room of dimensions (12 ft $\times$ 9 ft $\times$ 8 ft) is		
	(a) 18 ft	(b) 9 ft	
	(c) 15 ft	(d) 17 ft	
	(e) None of these		
<ul><li>3. Which among the following statements is not true?</li><li>(a) The volume of a sphere of radius V is equal to one third of the volume of a cylinder of radius V whose</li></ul>		atements is not true?	
		ius V is equal to one third of the volume of a cylinder of radius V whose height is	
	equal to double the diameter of the sphere.		
	(b) If A solid sphere of side 'a' is converted into a cone having its radius equals to the side of the cube, the		
	height of the cone is twice to its diameter.		
	(c) If diagonal of a cube is 9 m the	en volume of the cube will be $81 \text{m}^3$ .	
	(d) All the above		

(e) None of these

4.	If side of the cube is increased by 300 $\%$ then its surface area will increase by		
	(a) 12 times	(b) 13 times	
	(c) 14 times	(d) 15 times	
	(e) None of these		

5. A right angled triangle whose base is 21 cm and height is 20 cm, is made to turn round on the longer side. If the volume of the solid, thus generated V and the curved surface area is S, then \_\_\_\_\_

(a) $V = 9240$	$cm^3$ , S =	1914 cm <sup>2</sup>
----------------	--------------	----------------------

- (b)  $V = 8820 \text{ cm}^3$ ,  $S = 1885 \text{ cm}^2$
- (c) V=3820 cm<sup>3</sup>, S=1685 cm<sup>2</sup>
- (d) V=8240 cm<sup>3</sup>, S=1734cm<sup>2</sup>
- (e) None of these

# 6. Two cones have their heights in the ratio 2 : 3 and the radii of their bases are in the ratio 3 : 2, then the ratio of their volumes is \_\_\_\_\_

(a) 3 : 2	(b) 1 : 2
(c) 1 : 3	(d) 4 : 1

(e) None of these

7. The volume of the largest right circular cone which can be fitted in a cube whose side is '3a' equals to \_\_\_\_\_

- (a)  $\frac{1}{8}$  of volume of a hemisphere of radius 'a'
- (b)  $\frac{27}{8}$  of volume of sphere of radius 'a'.
- (c)  $\frac{27}{16}$  of volume of sphere of radius 'a'.
- (d)  $\frac{27}{8}$  of volume of hemisphere of radius 'a'
- (e) None of these

#### 8. Which one among the following statements is true?

(a) A cylinder, A hemisphere and a cone stand on equal and the same height. The ratio of their volumes is 3:1:2 respectively.

- (b) If a sphere is inscribed in a cube, then the ratio of the volume of the sphere to the volume of cube is 6 : n.
- (c) If the radius of a cylinder is tripled and height is doubled then, the volume will be 18 times of the previous.
- (d) All the above
- (e) None of these

#### 9. The circumradius of the triangle having its sides 11 cm, 60 cm and 61 cm is R. Find the Area of this

(b)  $12384.85 \, cm^2$ (d)  $13964.29 \, cm^2$ 

circle, $\left(Use \ \pi \frac{22}{7}\right)$	
(a) 11694.57 cm <sup>2</sup>	
$() \circ \circ \circ \circ \circ = 2$	

- (c)  $9694.57 \, cm^2$
- (e) None of these

## 10. Two circles touch each other externally. The sum of there areas is $274 \ \pi \text{cm}^2$ . The distance between their centres is 22 cm. Find the difference in their radii.

(a) 8 cm	(b) 10 cm
(c) 15 cm	(d) 7 cm
(e) None of these	



11. Find the area of the shaded region where each circle is of radius 7 cm as shown in the figure.

12. The length of an hour hand clock is 9 cm. The area covered by it from 9 : 20 am to 10 : 00 am is

(a) 14.143 $cm^2$	(b) 12.362 <i>cm</i> <sup>2</sup>
(c) 13.263 $cm^2$	(d) 10.285 cm <sup>2</sup>
(e) None of these	

13. The external length, breadth and height of a closed rectangular wooder box are 20 cm, 16 cm and 8 cm respectively. The weight of the box, when is empty, is 13 kg and when it is filled with sand, is 72 kg. If it is given that thickness of the wood is - cm, then the weights of one cubic cm of wood and cubic cm of sand are respectively \_\_\_\_\_

(a) 
$$\frac{13}{265}$$
 kg and  $\frac{59}{995}$  kg  
(b)  $\frac{13}{565}$  kg and  $\frac{59}{1995}$  kg  
(c)  $\frac{13}{365}$  kg and  $\frac{419}{1495}$  kg  
(d)  $\frac{13}{1565}$  kg and  $\frac{72}{1995}$  kg

14. A solid cylinder has total surface area of 1848 square cm. Its curved surface area is one third of its total surface area. If a hemisphere is formed from this cylinder, then the radius (in cm) of this hemisphere is \_\_\_\_\_

(a) 5	(b) 7 ∛6
(c) 14 <sup>3</sup> √6	(d) 17√6

<sup>(</sup>e) None of these

15.	The curved surface area of a l	hemisphere of radius 6 cm is equal to $\frac{2}{5}$ of the curved surface area of a	
	cone of radius 12 cm. Find the volume of the cone.		
	(a) 1357 71 <i>cm</i> <sup>3</sup>	(b) 102238 <i>cm</i> <sup>3</sup>	
	(c) 1252.61 <i>cm</i> <sup>3</sup>	(d) 2039.68 $cm^3$	
	(e) None of these		
16.	If the radius of a sphere is increased by 40 %, then its volume will be increased by		
	(a) 74%	(b) 74.4%	
	(c) 174.4%	(d) 80%	
	(e) None of these		
17.	If the length of a cuboid is increased by $30\%$ , breadth is increased by $40\%$ and height is increased by		
	50% then its volume will be i	ncreased by	
	(a) 173%	(b) 273%	
	(c) 163%	(d) 263%	
	(e) None of these		
18.	In an event, laddoos of same size were distributed among 400 students in which each student got $1$		
	laddoo. If the size of each lade	loos was decreased by 50 $\%$ then to how many students they distributed?	
	(a) 400	(b) 800	
	(c) 1600	(d) 3200	
	(e) None of these		
19.	Three solid cubes of type A a	nd three solid cubes of type B are melted to form a cube. If the lengths	
	of diagonals of cubes of type A and Type B are $4\sqrt{3}$ cm and $8\sqrt{3}$ cm respectively, then find the		
lateral surface area of the cube so formed.			
	(a) 625 <i>cm</i> <sup>2</sup>	(b) 529 <i>cm</i> <sup>2</sup>	
	(c) 576 $cm^2$	(d) 784 <i>cm</i> <sup>2</sup>	
	(e) None of these		
20.	In a right prism, the base is an equilateral triangle, Its is $135\sqrt{3}\ cm^3$ and lateral surface area is 270		
	$cm^2$ . If height of the prism is	increased by 60%, then its new volume will be	
	(a) $140\sqrt{3}$ cm <sup>3</sup>	(b) $216\sqrt{3} \ cm^3$	
	(c) $236\sqrt{3}$ cm <sup>3</sup>	(d) $306\sqrt{3}$ cm <sup>3</sup>	

21. Two cubes each of volume 1331 cm<sup>3</sup> are joined end to end. Find the difference between total surface area and lateral surface area of the cuboid so form.

(a) 576 <i>cm</i> <sup>2</sup>	(b) 484 <i>cm</i> <sup>2</sup>
(c) 376 $cm^2$	(d) 242 $cm^2$

(e) None of these

24. The difference between the areas of outside and inside surface of a cylindrical metallic pipe 14 cm long is  $132 \, cm^2$ . If the pipe is made of  $495 \, cm^3$  of metal, find the outer and inner radii of the pipe.

- (a)  $4.5\ \text{cm}$  and  $3\ \text{cm}$
- (b) 3.5 cm and 2.0 cm
- (c)  $5.0\ \text{cm}$  and  $3.5\ \text{cm}$
- (d)  $4.0\ \text{cm}$  and  $2.5\ \text{cm}$
- (e) None of these

25. The minute hand of a clock is  $\frac{x}{2}$  cm long. The area covered by the minute hand of the clock in 35

#### minutes is \_\_\_\_\_

(a) 
$$\frac{10x^2}{21}unit^2$$
 (b)  $\frac{11x^2}{24}unit^2$   
(c)  $\frac{7x^2}{5}unit^2$  (d)  $\frac{13x^2}{5}unit^2$ 

- 26. A closed rectangular shed has dimensions 28 m  $\times$  14m. It is inside a field. A cow is tied outside the shed at one of its corners with a 28 m rope. The area over which the cow can graze is \_\_\_\_\_
  - (a) 2002  $m^2$  (b) 1004  $m^2$
  - (c) 728  $m^2$  (d) 1992  $m^2$
  - (e) None of these

27. The volumes of two spheres are in the 125 : 64. If the radius is increased by 30 % in first sphere and 50 % in second sphere, then the ratio between their surface areas is \_\_\_\_\_

(a) 144 : 121	(b) 125 : 64
(c) 1 : 1	(d) 169 : 144
(e) None of these	

28. A cylindrical container of radius 8 cm and height 35 cm is filled with ice-cream. The whole ice-cream is distributed among 15 children in equal cones with hemispherical tops« If the height of the conical portion is five times the radius of its base, then the radius of the ice-cream cone is \_\_\_\_\_

(a) 3 cm	(b) 4 cm
(c) 5 cm	(d) 6 cm
(e) None of these	

29. The difference in radii of two spheres is 2 cm and ratios of their volumes on decreasing the radius of the larger sphere by  $69\frac{3}{13}\%$  and the smaller 13 sphere by  $33\frac{1}{3}\%$  is 8:27. Find the difference of

surface areas of two spheres.

(a) 276.57 <i>cm</i> <sup>2</sup>	(b) 168.39 cm <sup>2</sup>
(c) 302.87 $cm^2$	(d) 29439 cm <sup>2</sup>
(e) None of these	

30. The internal and external diameters of a hallow hemispherical vessel are 22 cm and 24 cm respectively. The cost to paint 1 cm<sup>2</sup> of the surface is Rs. 0.50. Find the total cost to paint the vessel all over.

(a) Rs. 669	(b) Rs. 869
(c) Rs. 325	(d) Rs. 485

31. A storage tank consists of a circular a cylinder with a hemisphere adjoined on either end. If the external diameter of the cylinder be 2.8 m and the cost of painting it on the outside at the rate of Rs. 20 per  $m^2$  is Rs. 765.60, then find the height of the circular cylinder.

(a) 8.7 m	(b) 2.95 m
(c) 435 m	(d) 5.65 m

(e) None of these

32. If a solid sphere of radius 10 cm is melted to stretch into a wire of 1000 cm, then curved surface area of the wire is \_\_\_\_\_

(a) 7005 <i>cm</i> <sup>2</sup>	(b) 7266.72 <i>cm</i> <sup>2</sup>
(c) 3268.66 <i>cm</i> <sup>2</sup>	(d) 8645.55 cm <sup>2</sup>
(e) None of these	

33. Water flows in a tank 110 m  $\times$  100 m at the base, through a pipe whose cross-section is 2 cm by 2.5 cm at the speed of 12 km per hour. In how many hours, the water will be 6 m deep in the tank?

(a) 70 hours	(b) 90 hours
(c) 110 hours	(d) 130 hours
(e) None of these	

34. The diameters of the top and bottom portions of a milk can are 30 cm and 8 cm respectively. If the

height of the can is 60 cm, then \_\_\_\_\_  $\left( Use \ \pi = \frac{22}{7} \right)$ 

- (a) area of metal sheet required to make the can (without lid) is 3692.86  $\ cm^2$
- (b) Amount of milk which container can hold is 18220  $cm^3$ .
- (c) area of metal sheet required = curved surface area of bottom base.
- (d) both (b) and (c)
- (e) None of these

#### 35. Which among the following is true about a regular tetrahedron?

- (a) All the faces of a regular tetrahedron are of right angled triangle.
- (b) The lateral surface area of a regular tetrahedron is  $\frac{2\sqrt{3}}{4}a^2$  when 'a' is the
- (c) The total surface area of a regular tetrahedron  $= 3a^2$  (when 'a' is the edge)

(d) Volume of regular tetrahedron is 
$$\frac{a^3}{3\sqrt{2}}$$

36. If in a triangle the sum of any two sides exceeds the third side by 8 cm, then its area \_\_\_\_\_

- (a) is  $16\sqrt{3} \ cm^2$
- (b) is  $10\sqrt{3} \text{ cm}^2$
- (c) is  $9\sqrt{3} \ cm^2$
- (d) Cannot be determined
- (e) None of these

37. A cylinder is within the cube touching all the vertical faces. A is the cylinder If their heights are same with the same base, then the ratio of their volumes is \_\_\_\_\_

(a) 21 : 33 : 11	(b) 42 : 23 : 11
(c) 42 : 33 : 22	(d) 42 : 33 : 11
(e) None of these	

38. A sphere is placed inside a right circular cylinder so as to touch the top, base and lateral surface of the cylinder If the radius of the sphere is 7 cm, then the volume of the cylinder is \_\_\_\_\_

(a) 308 cm <sup>3</sup>	(b) 1156 <i>cm</i> <sup>3</sup>
(c) 2156 <i>cm</i> <sup>3</sup>	(d) 368 $cm^3$
(e) None of these	

(d) 20	(0) 04
(c) 32	(d) 16

(e) None of these

40. In a triangle, the average of any two sides is 18 cm more than half of the third side. The area of the triangle (in sq. cm) is \_\_\_\_\_

(a) $162\sqrt{3}$	(b) 324√3
(c) $218\sqrt{3}$	(d) $420\sqrt{3}$

ANSWER - KEY				
<b>1.</b> (D)	<b>2.</b> (D)	<b>3.</b> (C)	<b>4.</b> (D)	<b>5.</b> (A)
<b>6.</b> (A)	<b>7.</b> (D)	<b>8.</b> (C)	<b>9.</b> (A)	<b>10.</b> (A)
<b>11.</b> (B)	<b>12.</b> (A)	<b>13.</b> (B)	<b>14.</b> (B)	<b>15.</b> (A)
<b>16.</b> (C)	<b>17.</b> (A)	<b>18.</b> (D)	<b>19.</b> (C)	<b>20.</b> (B)
<b>21.</b> (B)	<b>22.</b> (C)	<b>23.</b> (C)	<b>24.</b> (A)	<b>25.</b> (B)
<b>26.</b> (A)	<b>27.</b> (D)	<b>28.</b> (B)	<b>29.</b> (A)	<b>30.</b> (B)
<b>31.</b> (B)	<b>32.</b> (B)	<b>33.</b> (C)	<b>34.</b> (A)	<b>35.</b> (E)
<b>36.</b> (A)	<b>37.</b> (D)	<b>38.</b> (C)	<b>39.</b> (A)	<b>40.</b> (B)