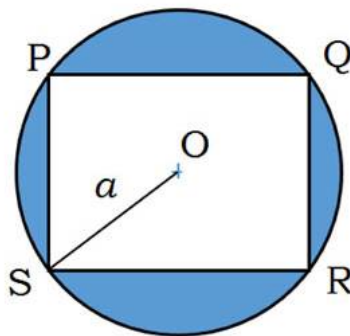


## GATE Aptitude Practice Questions Area & Volume

**Q.No. 1** A circle with centre O is shown in the figure. A rectangle PQRS of maximum possible area is inscribed in the circle. If the radius of the circle is  $a$ , then the area of the shaded portion is \_\_\_\_\_.



- (A)  $\pi a^2 - a^2$   
(B)  $\pi a^2 - \sqrt{2}a^2$   
(C)  $\pi a^2 - 2a^2$   
(D)  $\pi a^2 - 3a^2$

**Q.No. 2** The radius as well as the height of a circular cone increases by 10%. The percentage increase in its volume is \_\_\_\_\_.

- (A) 17.1                      (B) 21.0                      (C) 33.1                      (D) 72.8

**Q.No. 3** A square has sides 5 cm smaller than the sides of a second square. The area of the larger square is four times the area of the smaller square. The side of the larger square is \_\_\_\_\_ cm.

- (A) 18.50                      (B) 15.10                      (C) 10.00                      (D) 8.50

**Q.No. 4** A retaining wall with measurements  $30\text{m} \times 12\text{m} \times 6\text{m}$  was constructed with bricks of dimensions  $8\text{cm} \times 6\text{cm} \times 6\text{cm}$ . If 60% of the wall consists of bricks, the number of bricks used for the construction is \_\_\_\_\_ lakhs.

- (A) 30                          (B) 40                          (C) 45                          (D) 75

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**Q.No. 5** A wire would enclose an area of  $1936 \text{ m}^2$ , if it is bent into a square. The wire is cut into two pieces. The longer piece is thrice as long as the shorter piece. The long and the short pieces are bent into a square and a circle, respectively. Which of the following choices is closest to the sum of the areas enclosed by the two pieces in square meters?

- (A) 1096                      (B) 1111                      (C) 1243                      (D) 2486

**Q.No. 6** The area of an equilateral triangle is  $\sqrt{3}$ . What is the perimeter of the triangle?

- (A) 2                              (B) 4                              (C) 6                              (D) 8

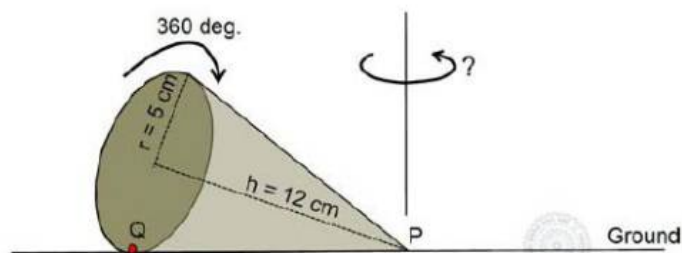
**Q.No. 7** The area of a square is  $d$ . What is the area of the circle which has the diagonal of the square as its diameter?

- (A)  $\pi d$                       (B)  $\pi d^2$                       (C)  $\frac{1}{4}\pi d^2$                       (D)  $\frac{1}{2}\pi d$

**Q.No. 8** A rectangle becomes a square when its length and breadth are reduced by 10 m and 5 m, respectively. During this process, the rectangle loses  $650 \text{ m}^2$  of area. What is the area of the original rectangle in square meters?

- (A) 1125                      (B) 2250                      (C) 2924                      (D) 4500

**Q.No. 9** A right-angled cone (with base radius 5 cm and height 12 cm), as shown in the figure below, is rolled on the ground keeping the point P fixed until the point Q (at the base of the cone, as shown) touches the ground again.



By what angle (in radians) about P does the cone travel?

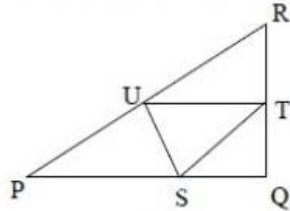
- (A)  $\frac{5\pi}{12}$                       (B)  $\frac{5\pi}{24}$                       (C)  $\frac{24\pi}{5}$                       (D)  $\frac{10\pi}{13}$

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- Q.No. 10** Let  $S_1$  be the plane figure consisting of the points  $(x, y)$  given by the inequalities  $|x - 1| \leq 2$  and  $|y + 2| \leq 3$ . Let  $S_2$  be the plane figure given by the inequalities  $x - y \geq -2$ ,  $y \geq 1$ , and  $x \leq 3$ . Let  $S$  be the union of  $S_1$  and  $S_2$ . The area of  $S$  is
- (A) 26                      (B) 28                      (C) 32                      (D) 34
- Q.No. 11** If the radius of a right circular cone is increased by 50%, its volume increases by
- (A) 75%                      (B) 100%                      (C) 125%                      (D) 237.5%
- Q.No. 12** A square pyramid has a base perimeter  $x$ , and the slant height is half of the perimeter. What is the lateral surface area of the pyramid?
- (A)  $x^2$                       (B)  $0.75x^2$                       (C)  $0.50x^2$                       (D)  $0.25x^2$
- Q.No. 13** Find the area bounded by the lines  $3x+2y=14$ ,  $2x-3y=5$  in the first quadrant.
- (A) 14.95                      (B) 15.25                      (C) 15.70                      (D) 20.35
- Q.No. 14** A window is made up of a square portion and an equilateral triangle portion above it. The base of the triangular portion coincides with the upper side of the square. If the perimeter of the window is 6 m, the area of the window in  $m^2$  is \_\_\_\_\_.
- (A) 1.43                      (B) 2.06                      (C) 2.68                      (D) 2.88
- Q.No. 15** A cube is built using 64 cubic blocks of side one unit. After it is built, one cubic block is removed from every corner of the cube. The resulting surface area of the body (in square units) after the removal is \_\_\_\_\_.
- (A) 56                      (B) 64                      (C) 72                      (D) 96
- Q.No. 16** A wire of length 340 mm is to be cut into two parts. One of the parts is to be made into a square and the other into a rectangle where sides are in the ratio of 1:2. What is the length of the side of the square (in mm) such that the combined area of the square and the rectangle is a **MINIMUM**?
- (A) 30                      (B) 40                      (C) 120                      (D) 180

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Q.No. 17 In the given figure angle Q is a right angle,  $PS:QS = 3:1$ ,  $RT:QT = 5:2$  and  $PU:UR = 1:1$ . If area of triangle QTS is  $20 \text{ cm}^2$ , then the area of triangle PQR in  $\text{cm}^2$  is \_\_\_\_\_.



Q.No. 18 A cube of side 3 units is formed using a set of smaller cubes of side 1 unit. Find the proportion of the number of faces of the smaller cubes visible to those which are NOT visible.

- (A) 1 : 4                      (B) 1 : 3                      (C) 1 : 2                      (D) 2 : 3

Options :

1. \* A
2. \* B
3. ✓ C
4. \* D

Q.No. 19 From a circular sheet of paper of radius 30 cm, a sector of 10% area is removed. If the remaining part is used to make a conical surface, then the ratio of the radius and height of the cone is \_\_\_\_\_.

**Answer Key**

Q.No.	Ans.
1	C
2	C
3	C
4	C
5	C
6	C
7	D
8	B
9	D
10	C
11	C
12	D
13	B
14	B
15	D
16	B
17	280
18	C
19	1.9 -2.2

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