

**General Instructions**

1. This question paper contains 4 printed pages.
2. This question paper consists of 30 questions in all. All questions are compulsory.
3. This question paper consists of four sections. Section – A carries 1 mark each, Section – B carry 2 marks each, Section – C carry 3 marks each and Section – D carry 4 marks each.

**(Section – A)**

Q 1: What is Euclid's division algorithm?

Q 2: If one zero of  $p(x) = 4x^2 - (8k^2 - 40k)x - 9$  is negative of the other, find the values of  $k$ .

Q 3: Represent the following situation in the form of quadratic equation:  
The area of a rectangular plot is  $528 \text{ m}^2$ . The length of the plot (in metres) is one more than twice its breadth. We need to find the length and breadth of the plot.

Q 4: How many (i) maximum (ii) minimum number of zeroes can a quadratic polynomial have?

Q 5: Evaluate:

$$\sin 23^\circ \cos 67^\circ + \cos 23^\circ \sin 67^\circ$$

Q 6: State the converse of *Pythagoras Theorem*.

**(Section – B)**

Q 7: A tangent AB at a point A of circle of radius 6 cm meets a line through the centre O at a point B. If  $OB = 10 \text{ cm}$ , find the length of AB.

Q 8: If the area of the surface of a sphere is  $32 \pi \text{ cm}^2$ , find the diameter of sphere.

Q 9: Median class of a frequency distribution is  $89.5 - 99.5$ . If number of observation is 98 and cumulative frequency preceding the median class is 40, find the frequency of median class given that median is 92.5

Q 10: A box contains 19 balls bearing number 1, 2, 3 ... 19. A ball is drawn at random from the box. What is the probability that the number of the balls drawn is a prime number?

Q 11: Find the value of  $p$  and  $q$  for which the following system of linear equation has infinite number of solutions:

$$2x + 3y = 7; (p + q)x + (2p - q)y = 21$$

Q 12: If  $\tan A = 1$  and  $\tan B = \sqrt{3}$ , find

$$\cos A \cdot \cos B - \sin A \cdot \sin B$$

**(Section – C)**

Q 13: Find the value of  $x$  such that  $PQ = QR$  where P, Q and R are the points  $(2, 5)$ ,  $(x, -3)$  and  $(7, 9)$  respectively.

Q 14: A man goes 150 m due east and then 200 m due north. How far is he from the starting point?

Q 15: A bag contains 7 white, 6 red and 12 green balls. A ball is drawn at random from the bag. Find the probability of getting:

- (i) A red ball
- (ii) Non-white ball.

**OR**

A bag contains 25 cards numbered from 1 to 25. One card drawn at random from the bag. Find the probability that this card has a number which is divisible by both 2 and 3.

Q 16: Show that the cube of any positive integer is of the form  $4m$ ,  $4m + 1$  or  $4m + 3$  for some integer  $m$ .

**OR**

Prove that  $\sqrt{2}$  is irrational.

Q 17: Two zeroes of the polynomial  $P(x) = 2x^4 - 3x^3 - 3x^2 + 6x - 2$  are  $\sqrt{2}$  and  $-\sqrt{2}$ . Find the remaining zeroes of  $P(x)$ , if any.

Q 18: Solve graphically the system of linear equations:

$$2x + y = 8; \quad x + 1 = 2y$$

Q 19: Which term of the Arithmetic Progression 3, 10, 17 ... will be 84 more than its 13<sup>th</sup> term?

Q 20: Evaluate:

$$\frac{\sin^2 20^\circ + \sin^2 70^\circ}{\sin \theta \cos(90^\circ - \theta) + \cos \theta \sin(90^\circ - \theta)}$$

**OR**

Prove that:

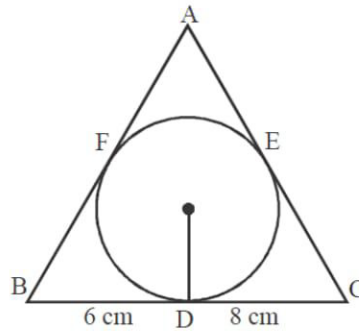
$$\frac{\tan \theta + \sec \theta - 1}{\tan \theta - \sec \theta + 1} = \frac{1 + \sin \theta}{\cos \theta}$$

Q 21: Find the value of  $p$  for which the points  $(-5, 1)$ ,  $(1, p)$  and  $(4, -2)$  are collinear.

Q 22: ABCDE is polygon whose vertices are A  $(-1, 0)$ , B  $(4, 0)$ , C  $(4, 4)$ , D  $(0, 7)$  and E  $(-6, 2)$ . Find the area of the polygon.

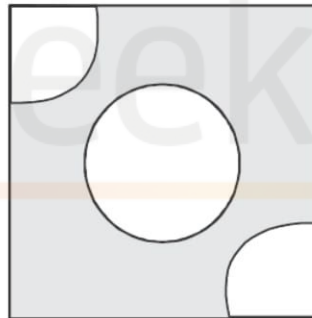
**(Section – D)**

Q 23: In the given figure  $\triangle ABC$  is drawn to circumscribe a circle of radius 3 cm, such that the segment BD and DC into which BC is divided by the point of contact D are of length 6 cm and 8 cm respectively, find side AB if the  $ar(\triangle ABC) = 63 \text{ cm}^2$ .



Q 24: Construct  $\triangle ABC$  in which  $AB = 4 \text{ cm}$ ,  $\angle B = 120^\circ$  and  $BC = 5 \text{ cm}$ . Construct another  $\triangle AB'C'$  similar to  $\triangle ABC$  such that  $AB' = \frac{5}{4} AB$ .

Q 25: From each of the two opposite corners of a square of side 8 cm, a quadrant of a circle of radius 1.4 cm is cut. Another circle of radius 4.2 cm is also cut from the centre as shown in figure. Find the area of the shaded portion. [Use  $\pi = \frac{22}{7}$ ]



**OR**

Solid spheres of diameter 6 cm are dropped into a cylindrical beaker containing some water and are fully submerged. If the diameter of the beaker is 18 cm and the water rises by 40 cm, find the number of solid spheres dropped in the water.

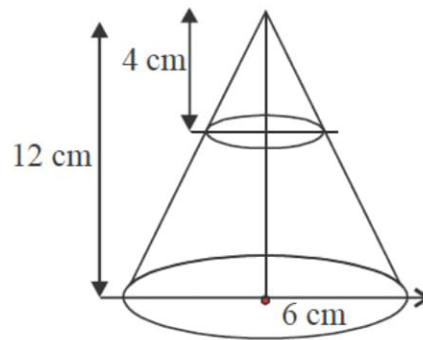
Q 26: Solve the equation:  $2(x - 3)^2 + 3(x - 2)(2x - 3) = 8(x + 4)(x - 4) - 1$

**OR**

A rectangular park is to be designed whose breadth is 3m less than its length. Its area is to be 4 square meters more than the area of a park that has already been made in the shape of an isosceles triangle with its base as the breadth of the rectangular park and altitude 12m. Find its length and breadth.

Q 27: A man is standing on the deck of a ship which is 10 m above the level of the sea. He observes the top of a hill as  $60^\circ$  and the angle of depression of the base of the hill as  $30^\circ$ . Find the distance of the hill from the ship and the height of the hill.

Q 28: In the given figure, 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.  
[Use  $\pi = \frac{22}{7}$  and  $\sqrt{5} = 2.236$ ]



Q 29: Using step-deviation method, calculate the arithmetic mean of the following grouped distribution.

Class	10 – 30	30 – 50	50 – 70	70 – 90	90 – 110	110 – 130	Total
Frequency	5	8	12	20	3	2	50

Q 30: State and prove basic proportionality theorem. Using this theorem show that intercepts on a transversal by three equidistant parallel lines are always equal.

# Answers

## Section A

2. Value of  $k = 0, 5$

3.  $2x^2 + x - 528 = 0$ , where  $x$  is breadth of plot.

4. Maximum = 2, Minimum = 0

5. 1

## Section B

7. AB = 8 cm

8.  $4\sqrt{2}$  cm

9. 30

10.  $\frac{8}{19}$

11.  $p = 5, q = 1$

12.  $\frac{1-\sqrt{3}}{2\sqrt{2}}$

## Section C

13.  $25/2$

14. 250 m

15. (i)  $\frac{6}{25}$ , (ii)  $\frac{28}{25}$  OR  $\frac{4}{25}$

17. Remaining zeros:  $\frac{1}{2}, 1$

18.  $x = 3, y = 2$

19. 25<sup>th</sup> term

20. 1

21.  $p = -1$

22. 44 square units

## Section D

23. 13 cm

25.  $5.48 \text{ cm}^2$  OR 90

26.  $x = 5$  OR  $l = 7m, b = 4m$

27. Distance = 17.32m, Height = 40 m

28.  $350.592 \text{ cm}^2$

29. Arithmetic mean = 65.6

All answers are done properly, if still there is any error, please inform us for the corrections. Thanks.