

This Question Paper contains 12 printed pages.  
(Section - A, B, C & D)

Sl.No.

**18 (E)**

(JULY 2022)

**Time : 3 Hours]**

**[Maximum Marks : 80**

**Instructions :**

- 1) Write in a clear legible handwriting.
- 2) This question paper has four Sections A, B, C & D and Question Numbers from 1 to 55.
- 3) All Sections are compulsory. General options are given.
- 4) The numbers to the right represent the marks of the question.
- 5) Draw neat diagrams wherever necessary.
- 6) New sections should be written in a new page. Write the answers in numerical order.
- 7) Calculator is not allowed.

**SECTION - A**

- Do as directed (Question numbers from 1 to 24) (Each question carries 1 mark) [24]

- Choose the correct option in questions from 1 to 12 to make each statement true.

- 1) The decimal expansion of \_\_\_\_\_ is non-terminating and recurring. [1]

(A)  $\frac{6}{15}$

(B)  $\frac{2}{15}$

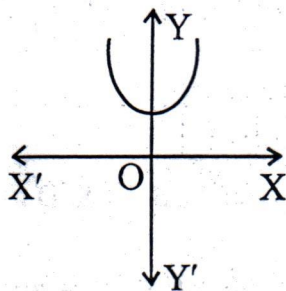
(C)  $\frac{3}{8}$

(D)  $\frac{4}{8}$

2) Mean of first ten natural numbers = \_\_\_\_\_. [1]

- (A) 5.5 (B) 6.5  
(C) 5.05 (D) 5

3) The graph of  $y = P(x)$  is given below. The number of zeroes of  $P(x)$  is \_\_\_\_\_. [1]



- (A) 1 (B) 2  
(C) 3 (D) 0

4) The lines representing the pair of equations \_\_\_\_\_, \_\_\_\_\_ are parallel. [1]

- (A)  $x + 2y - 4 = 0$ ,  $2x + 4y - 12 = 0$   
(B)  $2x + 3y - 9 = 0$ ,  $4x + 6y - 18 = 0$   
(C)  $x - 2y = 0$ ,  $3x + 4y - 20 = 0$   
(D)  $9x + 3y + 12 = 0$ ,  $18x + 6y + 24 = 0$

5) The discriminant ( $b^2 - 4ac$ ) of the quadratic equation  $3x^2 - 6x + 2 = 0$  is \_\_\_\_\_. [1]

- (A) -12 (B) 12  
(C) -60 (D) 60

- 6) For an A.P., if  $a = 7$ ,  $d = 3$  and  $n = 8$  then  $a_n =$  \_\_\_\_\_. [1]  
(A) 25 (B) 26  
(C) 27 (D) 28
- 7) The distance of  $M(x, y)$  from the origin  $O(0, 0)$  is \_\_\_\_\_. [1]  
(A)  $x^2 + y^2$  (B)  $\sqrt{x^2 + y^2}$   
(C)  $\sqrt{x^2 - y^2}$  (D)  $|x - y|$
- 8)  $\sqrt{1 + \tan^2 \theta} =$  \_\_\_\_\_. [1]  
(A)  $1 + \tan \theta$  (B)  $\sec^2 \theta$   
(C)  $\sec \theta$  (D)  $\operatorname{cosec} \theta$
- 9) The angle subtended by a minute hand of a clock at the centre of the clock in 10 minutes is \_\_\_\_\_. [1]  
(A)  $30^\circ$  (B)  $45^\circ$   
(C)  $60^\circ$  (D)  $90^\circ$
- 10) The formula to find the volume of a sphere is \_\_\_\_\_. [1]  
(A)  $\frac{4}{3}\pi r^3$  (B)  $\frac{2}{3}\pi r^3$   
(C)  $\frac{4}{3}\pi r^2$  (D)  $4\pi r^2$

11) If the zeroes of the quadratic polynomial  $P(x) = ax^2 + bx + c$  ( $a \neq 0$ )  $\alpha$  and  $\beta$ , then  $\alpha\beta =$  \_\_\_\_\_ [1]

(A)  $\frac{c}{a}$

(B)  $-\frac{c}{a}$

(C)  $-\frac{b}{a}$

(D)  $\frac{b}{a}$

12) The probability of an event cannot be \_\_\_\_\_. [1]

(A)  $\frac{2}{3}$

(B)  $-1.5$

(C) 15%

(D) 0.7

■ State whether the following statements (from 13 to 18) are true or false.

13)  $\sqrt{3}x + 5$  is a linear polynomial. [1]

14) The common difference of A.P. 10, 8, 6, 4, ----- is 2. [1]

15)  $\sin A = \cos A$  for all values of A. [1]

16) There is only one tangent at a point of the circle. [1]

17)  $3(\text{Mean}) = \text{Mode} + 2(\text{Median})$ . [1]

18) The sum of the probabilities of all the elementary events of an experiment is 1. [1]

- Fill in the blanks by selecting the proper alternatives given in brackets (from 19 to 24)

- 19) HCF (12, 21) = \_\_\_\_\_ (1, 3, 7) [1]
- 20) The graph of  $P(x) = x^2 + 3x + 2$  is a \_\_\_\_\_ (ray, line, parabola) [1]
- 21) A circle can have \_\_\_\_\_ parallel tangents at the most. (two, three, infinitely many) [1]
- 22) If the perimeter and the area of a circle are numerically equal, then the radius of the circle is \_\_\_\_\_ ( $\pi$ , 4, 2) [1]
- 23) The class mark of the class 30-40 is \_\_\_\_\_ (30, 35, 40) [1]
- 24) The probability of Sun setting in the west is \_\_\_\_\_ (-1, 0, 1) [1]

**SECTION - B**

- Answer any ten of the following questions from 25 to 38 (Each question carries 2 marks) [20]

- 25) Find a quadratic polynomial, the sum and the product of whose zeroes are 0 and -3. [2]

- 26) Divide  $x^2 + 7x + 10$  by  $x + 5$  and write the quotient and the remainder. [2]
- 27) Find the roots of the quadratic equation  $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$  by factorization. [2]
- 28) In a flower bed, there are 25 rose plants in the first row, 23 in the second, 21 in the third and so on. There are 5 rose plants in the last row. How many rows are there in the flower bed? [2]
- 29) Find the sum of first 10 terms of the A.P.  $-10, -5, 0, 5, \dots$ . [2]
- 30) Find a point on the  $y$ -axis which is equidistant from the points  $P(6, 5)$  and  $Q(-4, 3)$ . [2]
- 31) Evaluate :  $2 \tan^2 45^\circ - \cos^2 30^\circ + \sin^2 60^\circ$ . [2]
- 32) If  $\sin \theta = \frac{3}{4}$ , calculate  $\cos \theta$  and  $\tan \theta$ . [2]
- 33) The angle of elevation of the top of a tower from a point on the ground, which is 60 m away from the foot of the tower is  $30^\circ$ . Find the height of the tower. [2]
- 34) A tangent  $PA$  at a point  $P$  of a circle of radius 5 cm meets a line through the centre 'O' at a point  $A$ , so that  $OA = 12$  cm. Find  $PA$ . [2]
- 35) Two cubes each of side 5 cm are joined end to end. Find the surface area of the resulting cuboid. [2]

- 36) A cone of height 24 cm and radius of base 6 cm is made up of modelling clay. Rahul reshapes it in the form of a sphere. Find the radius of the sphere. [2]

- 37) Find the mode of the following data. [2]

Class Interval	10-25	25-40	40-55	55-70	70-85	85-100
Frequency	2	3	7	6	6	6

- 38) Two players Sania and Sangeeta play a tennis match. It is known that, the probability of Sania winning the match is 0.57. What is the probability of Sangeeta winning the match? [2]

### SECTION - C

- Solve any eight of the following questions from 39 to 50 (Each question carries 3 marks) [24]

- 39) Solve the pair of equations:  $2x + 3y = 7$ ,  $3x - 4y = 2$  by elimination method. [3]

- 40) The sum and the difference of two numbers are 18 and 2 respectively. Find the numbers. [3]

- 41) The sum of the reciprocals of Jayesh's ages (in years) 3 years ago and 5 years from now is  $\frac{1}{3}$ . Find his present age. [3]
- 42) Find the sum of first 51 terms of an A.P. whose second and third terms are 14 and 18 respectively. [3]
- 43) How many three digit numbers are divisible by 7? [3]
- 44) Find the area of the triangle whose vertices are P(1, -1), Q(-4, 6) and R(-3, -5). [3]
- 45) If A(1, 2), B(4, y), C(x, 6) and D(3, 5) are the vertices of a parallelogram taken in order, find x and y. [3]
- 46) A toy is in the form of a cone of radius 3.5 cm mounted on a hemisphere of same radius. The total height of the toy is 15.5 cm. Find the total surface area of the toy. [3]
- 47) Find the mean of the following data. [3]

Class Interval	100-150	150-200	200-250	250-300	300-350
Frequency	4	5	12	2	2



48) Find the median of the following data. [3]

Class Interval	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	5	8	20	15	7	5

49) One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting [3]

- i) a king of red colour
- ii) a face card
- iii) a spade

50) A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random from the box, find the probability that it bears [3]

- i) a two digit number
- ii) a perfect square number
- iii) a number divisible by 5.

#### SECTION - D

■ Solve any three of the following questions from 51 to 55 (Each question carries 4 marks)

[12]

51) In triangle ABC,  $\angle B = 90^\circ$ . Prove that  $AC^2 = AB^2 + BC^2$ .

[4]

- 52) If the square of one side of a triangle is equal to the sum of the squares of the other two sides, then prove that the angle opposite to the first side is a right angle. [4]
- 53) Draw a line segment of length 7 cm and divide it in the ratio 3:5. Write the steps of construction. [4]
- 54) Draw two tangents to a circle of radius 5 cm, which are inclined at an angle of  $60^\circ$  to each other. [4]
- 55) The median of the following data is 8.05. Find the values of  $a$  and  $b$ , if the total frequency is 100. [4]

Class Interval	1-4	4-7	7-10	10-13	13-16	16-19
Frequency	6	$a$	40	16	$b$	4