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

Sl.No. 88472

# 18 (E)

**(MARCH/APRIL 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

■ **Answer the following as per instruction given (Questions 1 to 24) (Each one mark).** **[24]**

- **All questions are compulsory.**

■ **Choose the correct option from the following (1 to 12):**

1) For pair of linear equations $2x+3y=5$ and $4x+6y-10=0$. There are _____ solution. **[1]**

(A) Infinity (B) Unique

(C) Zero (D) None

2) The product of zeroes in $P(x) = x^2 - 3x + 2$ is _____. [1]

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

(C) 1 (D) –2

3) The formula to find Discriminant of the quadratic equation is _____. [1]

(A) $D = b^2 + 4ac$ (B) $D = b^2 - 4ac$

(C) $D = b - 4ac$ (D) $D = c^2 - 4ab$

4) The formula to find $n^{th}$ term of an A.P. is _____. [1]

(A) $a_n = a + (n-1)d$ (B) $a_n = a - (n-1)d$

(C) $a_n = a + (n+1)d$ (D) None

5) Formula to find area of circle is _____. [1]

(A) $\pi rl$ (B) $\frac{\pi r^2 \theta}{360°}$

(C) $\pi r^2$ (D) $2\pi r$

6) Which of the following cannot be the probability of an event? [1]

(A) $\frac{2}{3}$ (B) 0.7

(C) 15% (D) –1.5

7) The probability of an event that is certain to happen is _____. [1]

(A) 0 (B) $-1$

(C) 1 (D) $\frac{1}{2}$

8) The wickets taken by a bowler in 10 cricket matches are follows: [1]

2, 6, 4, 5, 0, 2, 1, 3, 2, 3

Then mode will be _____.

(A) 3 (B) 2

(C) 1 (D) 0

9) The H.C.F. of 15 and 35 is _____. [1]

(A) 5 (B) 7

(C) 105 (D) 15

10) If $\alpha$ and $\beta$ are the zeroes of the polynomial $P(x) = ax^2 + bx + c\ (a \neq 0)$ then $\alpha + \beta =$ _____. [1]

(A) $-\frac{b}{a}$ (B) $\frac{b}{a}$

(C) $\frac{c}{a}$ (D) $-\frac{c}{a}$

11) The distance of the point $P(x, y)$ from the origin is _____. [1]

(A) $x^2 + y^2$ (B) $\sqrt{x^2 + y^2}$

(C) $x + y$ (D) None

12) If the perimeter and area of circle are numerically equal then radius of the circle will be _____. [1]

(A) 2 units (B) $\pi$ units

(C) 4 units (D) 7 units

■ **Write True or False for the following questions (13 to 18):**

13) $\sqrt{5}$ is an irrational number. [1]

14) Number of zeroes of polynomial $P(x) = x^3 - x$ are 3. [1]

15) 2, 2, 2, 2, ---- is an Arithmetic Progression. [1]

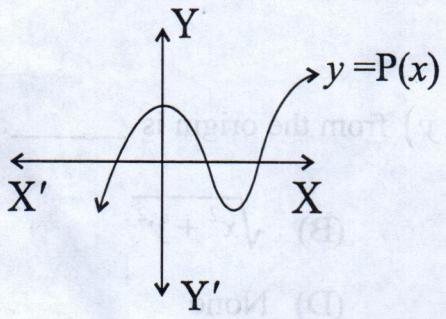
16) The value of $\sin 60°$ is $\frac{1}{2}$. [1]

17) $Z = 2M - 3\overline{x}$ [1]

18) $P(E) + P(\overline{E}) = -1$ [1]

■ **Fill in the blanks (19 to 24):**

19) In the given figure $y = P(x)$, the number of the zeroes of $P(x)$ are _____.
(2, 3, 4) [1]



**20)** $\sin^2\theta + \cos^2\theta =$ _____. (0, 1, 2) **[1]**

**21)** The tangent of a circle touches it at _____ point/points. (one, two, three) **[1]**

**22)** 2, $k$, 26 are three consecutive terms of an A.P. then $k =$ _____. (12, 14, 20) **[1]**

**23)** Formula to find volume of a 5 rupee coin is _____. $\left(\pi r^2, \pi r^2 h, \frac{1}{3}\pi r^2 h\right)$ **[1]**

**24)** If $\Sigma f_i x_i = 245$ and $\Sigma f_i = 100$ then Mean $(\bar{x})$ = _____. (24.5, 2.45, 0.245) **[1]**

## SECTION - B

■ **Answer any 10 questions from following. (25 to 38) (Each 2 marks).** **[20]**

**25)** In an Arithmetic Progression $a = 5$, $d = 3$, $a_n = 50$ then find "$n$". **[2]**

**26)** Find sum of A.P. 2, 7, 12, ----- to 10 terms. **[2]**

**27)** Find 30$^{th}$ term of A.P. 10, 7, 4, -----. **[2]**

**28)** The Base radius and height of cylinder are equal, if radius of cylinder is 7 cm find its volume. **[2]**

**29)** 2 cubes each of volume 64 $cm^3$ are joined end to end. Find the surface area of the resulting cuboid. **[2]**

**30)** A bag contains 3 red balls and 5 black balls. A ball drawn at random from the bag. What is the probability that the ball drawn is **[2]**

i) red?

ii) not red?

**31)** Find the Quadratic Polynomial whose sum of zero and product of zero are –3 and 2 respectively. **[2]**

**32)** Find zeroes of Quadratic Polynomial $P(x) = x^2 + 7x + 10$. **[2]**

**33)** Find roots of $2x^2 - x + \frac{1}{8} = 0$ by factorization method. **[2]**

**34)** If $\sin A = \frac{3}{4}$ then find cos A and tan A. **[2]**

**35)** Find the value of $2\tan^2 45° + \cos^2 30° - \sin^2 60°$. **[2]**

**36)** The angle of elevation of the top of the tower from a point on the ground, which is 30 m away from the foot of the tower is 30°. Find the height of the tower. **[2]**

**37)** Find the distance between A(–5, 7) and B(–1, 3). **[2]**

**38)** For a grouped data, $l = 40$, $h = 15$, $f_1 = 7$, $f_0 = 3$ and $f_2 = 6$ then find mode. **[2]**

## SECTION - C

■ **Answer any 8 of the following. (39 to 50) (Each 3 marks).** **[24]**

**39)** Find mean from following data: **[3]**

| Class interval | 10-25 | 25-40 | 40-55 | 55-70 | 70-85 | 85-100 |
|---|---|---|---|---|---|---|
| Number of students | 2 | 3 | 7 | 6 | 6 | 6 |

**40)** The following table shows age of the patients admitted in a hospital. Find mode. **[3]**

| Age | 5-15 | 15-25 | 25-35 | 35-45 | 45-55 | 55-65 |
|---|---|---|---|---|---|---|
| No. of patients | 6 | 11 | 21 | 23 | 14 | 5 |

**41)** Prove that the lengths of tangents drawn from an external point to a circle are equal. **[3]**

**42)** Solve the linear pair of equations, **[3]**

$\sqrt{2}x + \sqrt{3}y = 0$

$\sqrt{3}x - \sqrt{8}y = 0$

**43)** Five years ago Bhavin was thrice as old as Vrutik, 10 years later Bhavin will be twice as old as Vrutik. How old are Bhavin and Vrutik? **[3]**

**44)** Find two consecutive odd positive integers sum of whose square is 290. **[3]**

**45)** In A.P. given $a_{12} = 37$, $d = 3$ find "$a$" and "$S_{12}$". **[3]**

**46)** Find the point on the X-axis which is equidistant from (2, –5) and (–2, 9). **[3]**

**47)** If the points A (6, 1), B (8, 2), C (9, 4) and D (P, 3) are the vertices of a parallelogram, taken in order. Find the value of 'P'. **[3]**

**48)** How many silver coins, 1.75 cm in diameter and of thickness 0.2 cm, must be melted to form a cuboid of dimensions 5.5 cm × 10 cm × 3.5 cm. **[3]**

**49)** One card is drawn from a well shuffled deck of 52 cards. Calculate the probability that the card will be **[3]**

i) be an ace

ii) not be an ace

iii) red colour ace

**50)** A box contains 5 red marbles, 8 white marbles and 4 green marbles. One marble is taken out of the box random. What is the probability that marble will be **[3]**

i) red

ii) white

iii) not green

## SECTION - D

■ **Solve any 3 in detail (51 to 55) (Each 4 marks).** **[12]**

**51)** Prove that if a line is drawn parallel to one side of a triangle to intersect the other sides in distinct points, the other two sides are divided in the same ratio. **[4]**

**52)** Write Pythagoras theorem and prove it. **[4]**

53) Draw a line-segment of length 7.8 cm and divide it in the ratio 5:8. Measure two parts and write points of construction. **[4]**

54) Draw a circle of radius 6 cm. From a point 10 cm away from its centre, construct the pair of tangents to the circle and measure their length. Write steps of construction. **[4]**

55) The median of the following data is 525. Find the value of $x$ and $y$ if total frequency is 100. **[4]**

| Class Interval | 0-100 | 100-200 | 200-300 | 300-400 | 400-500 | 500-600 | 600-700 | 700-800 | 800-900 | 900-1000 |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency | 2 | 5 | $x$ | 12 | 17 | 20 | $y$ | 9 | 7 | 4 |

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