PVG's

Muktangan English School & Jr. College, Pune - 9

Preliminary Examination (2024-25)

STD X

Subject : Mathematics (Part I) Marks - 40

Date : 13.01.2025 Time : - 8.15 - 10.15 am

Q1. A) Attempt the following by choosing the correct alternative given and write the correct alternative alphabet [e.g 1-(A)]. (4)

1. If $P(A) = \frac{3}{4}$, $n(A) = 24$ then $n(S) =$ _____

   A) 32 B) 30 C) 40 D) 42

2. Cumulative frequencies in a grouped frequency table are useful to find _____.

   A) mean B) mode C) median D) all of these

3. What is the sum of the first five multiples of 8 ?

   A) 40 B) 56 C) 120 D) 240

4. What is the trading bewteen GSTIN holder and the consumer known as ?

   A) BB B) B2B C) BC D) B2C

B) Attempt the following subquestions. (4)

1. Find the value of determinant $\begin{bmatrix} -5 & -3 \\ 2 & 5 \end{bmatrix}$

2. Find the roots of the quadratic equation, if $(x + 7)(x - 3) = 0$

3. For a given A.P, $a = 3.5$ and $d = 0$, then find t_n.

4. Two coins are tossed simultaneously, write the sample space S.

Q2. A) Attempt any two of the following activites by filling in the boxes. (4)

1. Complete the table to prepare the co-ordinates of points, to draw a frequency polygon.

Classes	18-19	19-20	20-21	
Class mark	18.5	19.5		21.5
frequency	4		15	19
Co-ordinate Points		(19.5,13)	(20.5,15)	(21.5, 19)

2. A person purchased 100 shares of MV Rs.200. He paid brokerage at the rate of 1 %. Complete the following activity to find the amount to purchase 100 shares.

Solution:

The Brokerage = MV x rate of brokerage

$= 200 \times \frac{1}{100}$

After solving, Brokerage = Rs. [ ]

Purchase price per share = MV + [ ]

= Rs. [ ] — (on solving)

Amount paid to purchase 100 shares = Purchase price per share x 100

= Rs. [ ] — (on solving)

3. Sum of two numbers is 20 and their difference is 4. Find the numbers.

Solution:

Let the greater number be 'x' and smaller number be 'y'.

By first condition, we get,

[ ] = 20 ——— (1)

By second condition we get,

[ ] = 4 ——— (2)

Adding equation (1) and (2) we get,

x = [ ] ——— (after solving)

By substituting the value of x in equation (1)

we get y = [ ] ——— (on solving)

B) Attempt any four of the following subquestions. (8)

1. A box contains 25 cards bearing a number from 1 to 25. Find the probability that the card drawn bears a perfect cube number.
2. Reena purchased 2 pencils and 3 pens for Rs. 34 and her friend Leena bought 3 pencils and 4 pens for Rs. 64, Express the given information in algebraic equations.
3. In A.P, 3,7,11,15,19 ....., find the value of a, d and t_n
4. Solve x + y = 3 and 3x - 2y = 4 by Cramer's Rule, If D = -5 find the value of x.
5. Find the roots of the following quadratic equation by factorization method : $x^2 - 3x - 10 = 0$

Q3. A) Attempt any one of the following activities. (3)

1. Medical checkup of 180 women was conducted in a health care centre. 50 of them were found anaemic, 40 suffered from cataract, 30 had respiratory disorder and 60 were healthy. Complete the table given below to draw the pie diagram.

Medical Checkup	Number of women	Measure of Central angle $\theta =$ ☐ —— (formula)
Anaemic	50	$\frac{50}{\square} \times 360^0 = 100^0$
Cataract	40	$\frac{40}{180} \times 360^0 =$ ☐
Respiratory disorder	☐	☐ (write only final answer)
Healthy	60	☐ (write only final answer)
Total	180	360^0

2. A card is drawn from a well shuffled pack of 52 playing cards. Find the probability of the card drawn is a red card.

Solution :

A pack contains 52 cards. Let 'S' be the sample space.

$\therefore$ n(S) = ☐

Let 'A' be the event that card drawn is a red card.

$\therefore$ n(A) = ☐

$P(A) = \frac{n(A)}{\square}$ —— (by formula)

$P(A) = \frac{\square}{\square}$

$\therefore P(A) = \frac{\square}{\square}$ —— (by simplification)

Hence, the probability of getting a red card is $\frac{\square}{\square}$.

B) Attempt any two of the following subquestions. (6)

1. The total value (with GST) of a remote controlled toy car is Rs. 1770. Rate of GST is 18% on toys. Find the taxable value, CGST and SGST for this toy car.

2. Grouped frequency distribution of supply of milk to hotels and the number of hotels is given in the following table. Find the mode of the supply of milk.

Milk (in ltr.)	1-3	3-5	5-7	7-9	9-11	11-13
No. of hotels	7	5	15	20	35	18

3. Two given A.P.'s are 9, 7, 5 .... and 24, 21, 18 .... . If n^{th} term of both the progression are equal, then find the value of n and the n^{th} term.

4. Solve : $\sqrt{3}x^2 + 10x - 8\sqrt{3} = 0$ by formula method.

Q4. Attempt any two of the following subquestions. (8)

1. Smt. Smita Agarwal invested Rs. 10,200 when MV of the share was Rs. 100. She sold 60 shares when MV was Rs. 125 and sold remaining shares when MV was Rs. 90. She paid 0.1% brokerage for each trading. Find whether she made profit or loss and how much?

2. Find the median of the number of hours, the workers work for the following data.

No. of hours (Per day)	8-10	10-12	12-14	14-16
No. of workers	150	500	300	50

3. The sum of the areas of two squares is 400 sq. m. If the difference between their perimeters is 16 m, find the sides of both the squares.

Q5. Attempt any one of the following subquestions. (3)

1. Draw a graph of the equation x + 2y = 4. Find the area of triangle formed by the line intersecting the X - axis and Y - axis.

2. A jar contains 24 marbles, some are green and others are blue. If a marble is drawn at random from the jar, the probability that it is a green marble is $\frac{2}{3}$. Find the number of blue marbles.

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