Pre board 2

TIME: 2 hours BVP/X/Maths/2024-25

MAX.MARKS: 50

General Instruction :

1. This Question Paper has 5 Sections A, B, C, D & E.
2. Section A has 6 MCQs carrying 1 mark each.
3. Section B has 4 questions carrying 02 marks each.
4. Section C has 4 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 1 case based integrated units of assessment (04 marks each) with sub- parts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice has been provided.

Section A

Q1. A polynomial of degree n has

(a) only 1 zero (b) exactly n zeroes

(c) atmost n zeroes (d) more than n zeroes

Q2. If the HCF of 408 and 1032 is expressible in the form $1032 \times 2 + 408 \times p$, then p will be

a) 5 b)-5 c)4 d)-4

Q3. If the sum of the zeroes of the polynomial $p(x) = (k^2 - 14)x^2 - 2x - 12$ is 1, then the value of k is

a) 4 b) -4 c) ± 4 d) ± 2

Q4. If $ax + by = a^2 - b^2$ and $bx + ay = 0$, then value of $(x + y)$ is

a) a-b b) a+b c) -a+b d) -a -b

Q5. If 1 is a root of the equations $ay^2 + ay + 3 = 0$ and $y^2 + y + b = 0$, then the value of ab is

a) 3 b)-3 c) 2 d)-2

Q6. The angles of a triangle are in A.P., the least being half the greatest. Then The smallest angle is

a) 50° b)40° c)60° d)30°

Section B

Q7. How many solutions does the pair of equations $y = 0$ and $y = -5$ have?.Justify your answer.

OR

Find the value of k and p for which the following pair of linear equations has infinite number of solutions:

$2x + 3y = 7$;

$kx + (k + p)y = 28$.

Q8. For what value of k, are the roots of the quadratic equation $y^2 + k^2 = 2(k + 1)y$ equal?

Q9. Find the zeroes of $y^4 + 4y^2 + 5$.

OR

Find the zeroes of $2\sqrt{3}x^2 - 5x + \sqrt{3}$ .Also verify the relation between zeroes and coefficients.

Q10. Dudhnath has two vessels containing 720 ml and 405 ml of milk respectively. Milk from these containers is poured into glasses of equal capacity to their brim. Find the minimum number of glasses that can be filled.

OR

Find the largest number which divides 318 and 739 leaving remainder 3 and 4 respectively.

Section C

Q11. Solve for x.

$$\frac{1}{2a+b+2x} = \frac{1}{2a} + \frac{1}{b} + \frac{1}{2x}$$

Q12. The age of the father is twice the sum of the ages of his 2 children. After 20 years, his age will be equal to the sum of the ages of his children. Find the age of the father.

Q13. If α and β are zeroes of $p(x) = kx^2 + 4x + 4$, such that $\alpha^2 + \beta^2 = 24$, find k.

OR

If α and β are the zeroes of $x^2 + px + q$, then find the value of $\left(\frac{\alpha}{\beta}+2\right)\left(\frac{\beta}{\alpha}+2\right)$.

Q14. How many terms of the A.P 65, 60, 55 ... be taken so that their sum is zero?

Section D

Q15. While boarding an aeroplane, a passenger got hurt. The pilot, showing promptness and concern, made arrangements to hospitalise the injured and so the plane started late by 30 minutes. To reach the destination, 1500 km away in time, the pilot increased the speed by 100 km/hour. Find the original speed/hour of the plane

Q16. Amit bought two pencils and three chocolates for ₹11 and Sumeet bought one pencil and two chocolates for ₹7. Represent this situation in the form of a pair of linear equations. Find the price of one pencil and that of one chocolate graphically.Also find the area of triangle formed by the lines and x-axis.

Q17.i) Prove that $3 - \frac{7\sqrt{11}}{8}$ is an irrational number given that $\sqrt{11}$ is an irrational number.

ii) Prove that 8^n can never end with digit 0 for any natural number n.

Q18.A thief, after committing a theft, runs at a uniform speed of 50 m/minute. After 2 minutes, a policeman runs to catch him. He goes 60 m in first minute and increases his speed by 5 m/ minute every succeeding minute. After how many minutes, the policeman will catch the thief?

Or

In a potato race, a bucket is placed at the starting point, which is 5 m from the first potato, and the other potatoes are placed 3 m apart in a straight line. There are ten potatoes in the line .

A competitor starts from the bucket, picks up the nearest potato, runs back with it, drops it in the bucket, runs back to pick up the next potato, runs to the bucket to drop it in, and she continues in the same way until all the potatoes are in the bucket. What is the total distance the competitor has to run?

10

Section E

Shown below is a house of cards, a structure created by stacking playing cards on the top of each other in the shape of a pyramid. Each small triangle is made using 3 cards and each layer has 1 less triangle than the layer below it.

Ankit and his friends want to make a house of cards.

Based on the above information answer the following questions.

$-\frac{b}{a} = -\frac{4}{k}$

$(\alpha+\beta)^2 - 2\alpha\beta = 24$

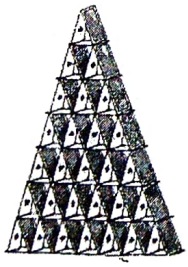
$\left(-\frac{4}{k}\right)^2 - \frac{2\times4}{k} = 24$

$\left(+\frac{16}{k^2}\right) - \frac{8}{k}$

$\frac{16}{k^2} - \frac{8}{k}$

$\frac{16-8k}{k^2} = 24$

$16 - 8k$



a) Ankit and his friends want to use 3 cards in the top layer and 18 in the bottom layer., form an AP showing number of cards in each layer. (1)

b)If Ankit uses 30 cards in the bottom layer, then how many cards are there in the fifth layer? (1)

c) Ankit is planning to make a pyramid with the top and bottom layer containing 15 and 138 cards respectively. How many layers will such a pyramid have? (2)