INDIAN SCHOOL AL WADI AL KABIR

Pre-Mid Term Examination (2024-25)

Class: X | Sub: MATHEMATICS (041) | Max Marks: 30

Date:28 - 05 - 2024 | Set-I | Time: 1 hour

General Instructions:

1. This Question paper contains - four sections A, B, C and D. Each section is compulsory. However, there are internal choices in some questions.
2. Section A has 06 MCQ's and 01 Assertion-Reason based questions of 1 mark each.
3. Section B has 3 Very Short Answer (VSA)-type questions of 2 marks each.
4. Section C has 3 Short Answer (SA)-type questions of 3 marks each.
5. Section D has 2 source based/case based/passage based/integrated units of assessment (4 marks each) with sub parts.

Section A (1 mark each)

Q.1.	If α and β are the zeros of a polynomial $f(x) = px^2 - 2x + 3p$ and $\alpha + \beta = \alpha\beta$, then p is:							
	A	$\frac{-2}{3}$	**B**	$\frac{2}{3}$	**C**	$\frac{1}{3}$	**D**	$\frac{-1}{3}$
Q.2.	Given that HCF (120, 160) = 40, find the LCM (120, 160).							
	A	480	**B**	280	**C**	48	**D**	28
Q.3.	The pair of equations $x + 2y + 5 = 0$ and $3x - 6y + 1 = 0$ have:							
	A	infinitely many solutions	**B**	exactly two solutions	**C**	unique solution	**D**	no solution
Q.4.	Let a and b be two positive integers such that $a = p^3q^4$ and $b = p^2q^3$, where p and q are prime numbers. If HCF(a, b) = p^mq^n and LCM(a, b) = p^rq^s, then (m+n)(r+s) equals:							
	A	15	**B**	30	**C**	35	**D**	72
Q.5.	The pair of equations $x = a$ and $y = b$ graphically represents lines which are:							
	A	parallel	**B**	intersecting at (b, a)	**C**	coincident	**D**	intersecting at (a, b)

<table>
<tr><td>Q.6.</td><td colspan="8">The quadratic polynomial p(x) with -24 as the product of its zeroes and 4 as one of its zeroes is:</td></tr>
<tr><td></td><td>A</td><td>$x^2 – 2x - 24$</td><td>B</td><td>$x^2 + 2x - 24$</td><td>C</td><td>$x^2 + 2x + 24$</td><td>D</td><td>$x^2 – 4x - 24$</td></tr>
<tr><td>Q.7.</td><td colspan="8">DIRECTION: In the following question, a statement of Assertion (A) is followed by a statement of Reason (R).
Choose the correct option
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A)
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.
Statement A (Assertion): The polynomial $x^2 – 5x + 4$ has two zeroes.
Statement R (Reason): A polynomial of degree 3 is called a cubic polynomial.</td></tr>
<tr><td colspan="9">Section B (2 marks each)</td></tr>
<tr><td>Q.8.</td><td colspan="8">Find the zeroes of the polynomial $4x^2 – 15x + 9$.</td></tr>
<tr><td>Q.9.</td><td colspan="8">Solve for x and y: $32x + 33y = 34$;
$33x + 32y = 31$</td></tr>
<tr><td>Q.10.</td><td colspan="8">Check whether 6^n can end with the digit 0 for any natural number n.
OR
Find the smallest number which when divided by 25, 40 and 60 leaves remainder 7 in each case.</td></tr>
<tr><td colspan="9">Section C (3 marks each)</td></tr>
<tr><td>Q.11.</td><td colspan="8">Solve the following equations graphically.
$2x + y = 2$; $2y – x = 4$</td></tr>
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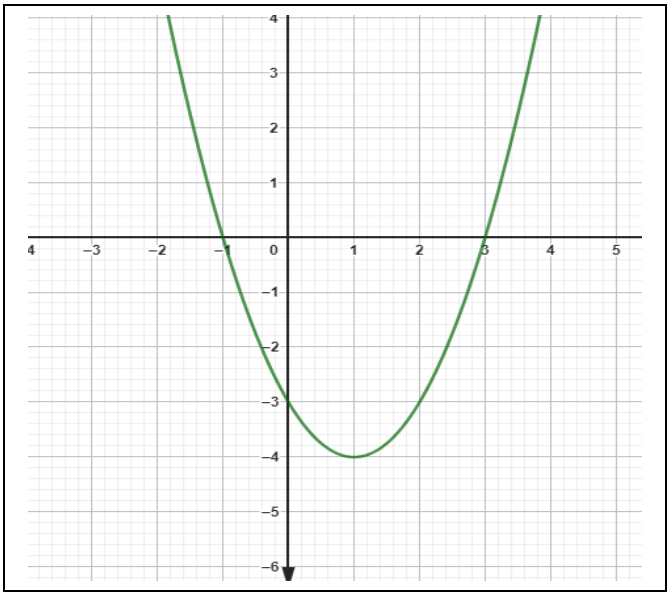
Q.12.	Prove that $5 + 2\sqrt{3}$ is an irrational number, given $\sqrt{3}$ is irrational. **OR** Find by prime factorisation the LCM of the numbers 18180 and 7575. Also, find the HCF of the two numbers.
Q.13.	The father's age is six times his son's age. Four years hence, the age of the father will be four times his son's age. What are the present ages in years of the son and the father?
	Section E (4 marks each)
Q.14.	**Case study-based – 1** Rainbow is an arc of colours that is visible in the sky after rain or when water droplets are present in the atmosphere. The colours of the rainbow are generally, red, orange, yellow, green, blue, indigo and violet. Each colour of the rainbow makes a parabola. We know that any quadratic polynomial $p(x) = ax^2 + bx + c$; $(a \neq 0)$ represents a parabola on the graph paper.   Based on the above, answer the following questions: (i)The graph of a rainbow $y = f(x)$ is shown in the figure. Write the number of zeroes of the curve. (1m) (ii)Write the expression for the polynomial representing the rainbow from the above graph. (1m)

	(iii) (a)If a rainbow is represented by the quadratic polynomial $p(x) = x^2 + (a + 1)x + b$, whose zeroes are 2 and -3, find the value of a and b. (2m) **OR** (b)The polynomial $x^2 - 2x - (7p + 3)$ represents a rainbow. If (-4) is a zero of the polynomial, find the value of p and the other zero. (2m)
Q.15.	A sweet seller has 420 Kaju barfis and 130 Badam burfis. She wants to stack them in such a way that each stack has the same number and they take up the least area of the tray.  Based on the above, answer the following questions: (i) The sum of exponents of prime factors in the prime factorisation of 130. (1m) (ii) Write the prime factorisation of 420. (1m) (iii) (a)What is the maximum number of burfis to be kept in each stack if each stack has the same number of burfis? (2m) **OR** (b)Find the number of stacks needed for Kaju burfis and the number of stacks needed for Badam burfis if there are same number of burfis in each stack. (2m)

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