INDIAN SCHOOL AL WADI AL KABIR

Pre-Mid-Term Examination (2024-25)

Class: X	Sub: MATHEMATICS (041)	Max Marks: 30
Date:28 - 05 - 2024		Time: 1 hour

Marking Scheme

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)
Q.6.	The quadratic polynomial p(x) with -24 as the product of its zeroes and 4 as one of its zeroes is:							
	A	$x^2 – 2x - 24$	B	$x^2 + 2x - 24$	C	$x^2 + 2x + 24$	D	$x^2 – 4x - 24$

Q.7.	(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A) .	1m
	Section B (2 marks each)	
Q.8.	$p(x) = 4x^2 – 15x + 9$ sum= -15, product = 36 $4x^2 – 12x – 3x + 9 = 4x(x – 3) -3(x – 3)$ $= (x – 3)(4x -3)$ $(x – 3)(4x -3) = 0$ $x – 3 = 0, x = 3$ $4x – 3 = 0, x = \frac{3}{4}$	 1/2m 1/2m 1/2m 1/2 m
Q.9.	$32x + 33y = 34$ ….(i) $33x + 32y = 31$ (ii) Adding the equations, $65x + 65y = 65$, $x+ y = 1$…(iii) Subtracting the equations, $x – y = -3$…………….(iv) Solving (iii) and (iv), $2x = -2$, $x = -1$, $y = 2$	 1m 1/2m 1/2m
Q.10.	If the number 6^n, for any n, were to end with the digit zero, the prime factorisation of 6^n would contain both the primes 2 and 5. This is not possible because $6^n = (2\times 3)^n$; So the only primes in the factorisation of 6^n is 2and 3 and not 5. The uniqueness of the Fundamental Theorem of Arithmetic guarantees that there are no other primes in the factorisation of 6^n. So, there is no natural number n for which 6^n ends with the digit zero. (½ m)	1/2m 1/2m 1/2m

	OR	
	LCM(25, 40, 60)	1/2m
	$25 = 5^2$	
	$40 = 2^3 \times 5$	
	$60 = 2^2 \times 3 \times 5$	
	LCM(25, 40, 60)= $2^3 \times 5^2 \times 3 = 600$	1m
	Smallest number = 600 + 7 = 607	1/2m

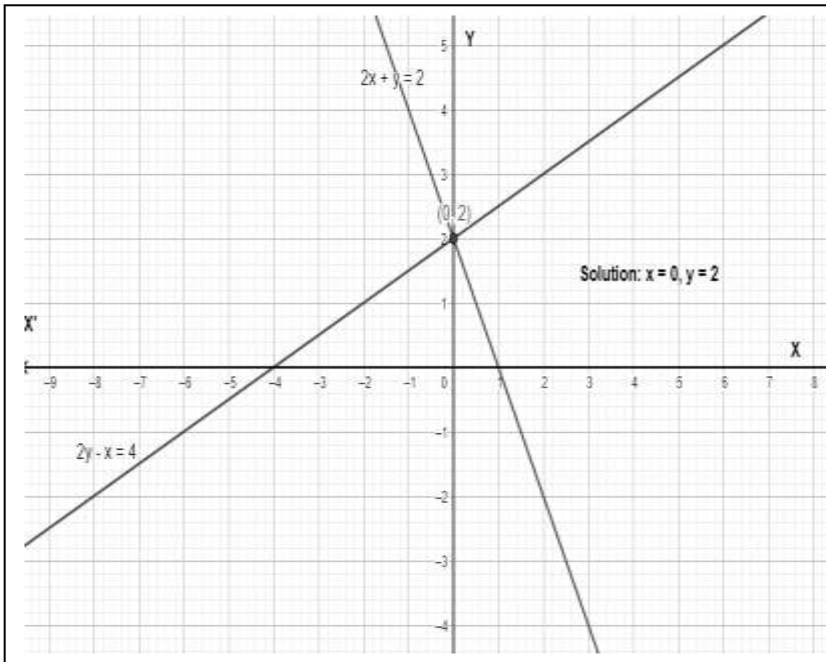
Section C (3 marks each)

Q.11.

Drawing correct graphs

($2\frac{1}{2}$ m)

Solution(1/2 m)



Q.12.	Let $5 + 2\sqrt{3}$ be rational.	(1/2m)
	$5 + 2\sqrt{3} = \frac{a}{b}$, a and b are coprime and $b \neq 0$	(1/2m)

	$2\sqrt{3} = \frac{a}{b} - 5$ $\sqrt{3} = \left(\frac{a}{b} - 5\right) \times \frac{1}{2}$ LHS= rational, RHS = irrational, LHS ≠ RHS Our assumption $5 + 2\sqrt{3}$ be rational is not correct. Therefore $5 + 2\sqrt{3}$ is irrational.	(1/2m) (1/2m) (1/2 m) (1/2 m))
	OR.	
	$18180 = 2^2 \times 3^2 \times 5 \times 101$ $7575 = 3 \times 5^2 \times 101$ LCM(18180, 7575) = 90900 HCF(18180, 7575) = 1515	(1m) (1 m) (1/2 m) (1/2 m))
Q.13.	Let Father's age be x yrs and son's age be y yrs. $x = 6y$…..(i) $x + 4 = 4(y + 4)$ $x + 4 = 4y + 16$ $x - 4y = 12$……(ii) Solving (i) and (ii), y = 6 and x = 36 The age of son is 6 years and that of father is 36 years.	(1/2 m) (1/2 m) (1/2 m) (1/2 m) (1/2 m) (1/2 m)
Section D (4 marks each)		
Q.14.	(i) 2 zeroes. (1m) (ii) $p(x)= x^2 - 2x - 3$ (1m) (iii) (a) Sum of the zeroes = -1 = -(a + 1) (1/2m) a = 0 (1/2m) Product of the zeroes = b = -6 (1m)	

	a= 0, b = -6 **OR** (b) Let p(x) = $x^2 - 2x - (7p + 3)$ p (-4) = 0 $(-4)^2 - 2\times(-4) - 7p - 3 = 0$ (1/2m) 16 + 8 – 7p – 3 = 0 21 = 7p p = 3 (1/2m) Let the other zero be q. -4 + q = 2 (1/2 m) q = 6 (1/2 m)
	(i) 3 (1m) (ii) $2^2\times3\times5\times7$. (1m) (iii) HCF(130, 420) 130 = $2\times5\times13$ (1/2m) 420 = $2^2\times3\times5\times7$ (1/2m) HCF(130, 420) = 10 (1m) Maximum number of burfis is 10 . **OR** HCF(130, 420) = 10 (1 1/2m) No. of stacks needed for Kaju burfis = $\frac{420}{10}$ = 42 No. of stacks needed for Badam burfis = $\frac{130}{10}$ = 13 (1/2m)