IDEAL INDIAN SCHOOL, DOHA-QATAR
PERIODIC TEST 1, JUNE 2024
MATHEMATICS

Class: X **Max Marks: 40**
Date: 09.06.2024 **SET 2** **Duration: 2hrs**

General Instructions:
1. This Question Paper has 5 Sections A-E.
2. Section A has10 MCQs carrying 1 mark each.
3. Section B has 2 questions carrying 2 marks each.
4. Section C has 4 questions carrying 3 marks each.
5. Section D has 2 questions carrying 5 marks each.
6. Section E has 1 case based integrated units of assessment (4 marks) with sub-parts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 1question of 5 marks, 1question of 3 marks and 1question of 2 marks has been provided. An internal choice has been provided in the 2 marks question of Section E.
8. Draw neat figures wherever required.

S. No	SECTION – A Section A consists of 10 questions of 1mark each.	Marks
1	If the equation $16x^2+6kx+4=0$ has equal roots, then the value of k is (a) ±8 (b) $\pm\frac{8}{3}$ (c) $\pm\frac{3}{8}$ (d) 0	1
2	The arithmetic mean and mode of a data are 24 and 12 respectively, then its median is (a) 25 (b) 18 (c) 20 (d) 22	1
3	If two positive integers a and b are expressible in the form $a = pq^2$ and $b = p^3q$; p, q being prime numbers, then LCM (a, b) is (a) pq (b) p^3q^3 (c) p^3q^2 (d) p^2q^2	1
4	Three bulbs red, green and yellow flash at intervals of 80 seconds, 90 seconds and 110 seconds. All three flash together at 8:00am. At what time will be three bulbs flash altogether again? (a) 9 am (b)9:12 am (c)10am (d)10:12 am	1
5	For the following distribution, Class: 0-5 | 5-10 | 10-15 | 15-20 | 20-25 Frequency: 10 | 15 | 12 | 20 | 9 The sum of the lower limits of the median and model class is (a)15 (b)25 (c)30 (d)35	1

6	If HCF (26, 169) = 13, then LCM (26, 169) = (a) 26 (b) 52 (c) 338 (d) 13	**1**
7	The HCF and the LCM of 12, 21, 15 respectively are (a) 3, 140 (b) 12, 420 (c) 3, 420 (d) 420, 3	**1**
8	**Statement 1 (Assertion)**: The system of linear equations $9x + 3y + 12 = 0$ and $18x + 6y + 24 = 0$ have infinitely many solutions. **Statement 2 (Reason)**: The system of linear equations $a_1x+b_1y+c_1=0$ and $a_2x+b_2y+c_2=0$ have infinitely many solutions, if $\frac{a1}{a2} = \frac{b1}{b2} = \frac{c1}{c2}$ (a) Statement 1 and Statement 2 are true; Statement 2 is the correct explanation for Statement 1 (b) Statement 1 and Statement 2 are true; Statement 2 is not a correct explanation for Statement 1 (c) Statement 1 is true, Statement 2 is false (d) Statement 1 is false, Statement 2 is true	**1**
9	If the system of equations k x - 5y = 2, 6x + 2y = 7 has no solution, then k= (a) -10 (b)- 5 (c)-6 (d) -15	**1**
10	The quadratic equation $2x^2-\sqrt{5}\,x + 1 = 0$ has (a) two distinct real roots (b) two equal real roots (c) no real roots (d) more than 2 real roots	**1**
	SECTION – B	
	Section B consists of 2 questions of 2 marks each.	
11	Prove that $2+5\sqrt{3}$ is an irrational number, given that $\sqrt{3}$ is an irrational number.	**2**
12	If α and β are the zeros of the polynomial $f(x) = x^2 - 5x + 4$, find the value of $\frac{1}{\alpha}+\frac{1}{\beta} - 2\alpha\beta$. OR Frame a quadratic polynomial whose zeros are $2 + \sqrt{3}$ and $2 - \sqrt{3}$	**2**
	SECTION – C	
	Section C consists of 4 questions of 3 marks each.	
13	A train takes 2 hours less for a journey of 300 km if its speed is increased by 5km/hr from its usual speed. Find the usual speed of the train.	**3**

14 If the mean of the following distribution 54, find the value of p **3**

Class	0 - 20	20 - 40	40 - 60	60 - 80	80 - 100
Frequency	7	p	10	9	13

OR

Find the mode of the following frequency distribution

Class	100-120	120-140	140-160	160-180	180-200
Frequency	12	14	8	6	10

15 Solve for x and y : **3**
$49x + 51y = 499 \; and \; 51x + 49y = 501$

16 Find the zeros of the quadratic polynomial $2x^2 - 7x + 6$, and verify the relationship between zeroes and its coefficients. **3**

SECTION – D

Section D consists of 2 questions of 5 marks each.

17 If the median of the distribution given below is 28.5, find the value of x and y **5**

Class Interval	0-10	10-20	20-30	30-40	40-50	50-60	Total
No. of students	5	x	20	15	y	5	60

18 Solve the system of equations $x + 3y = 6 \; and \; 2x - 3y = 12$ graphically and shade the region bounded by these lines and Y-axis. Hence find the area of the triangle so obtained. **5**

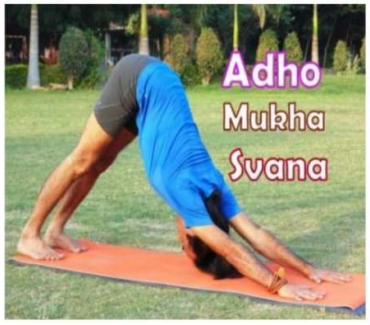
OR

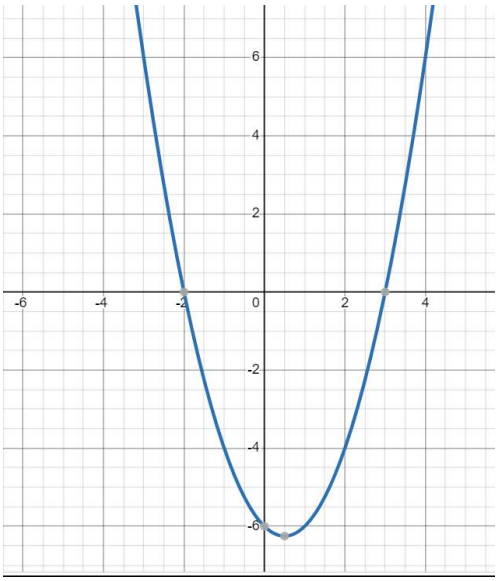
The coach of a cricket team buys 7 bats and 6 balls for Rs. 3800. Later, he buys 3 bats and 5 balls for Rs. 1750. Find the cost of each bat and ball.

SECTION – E

Section E consists of 1 case-study based question of 4 marks

19 An asana is a body posture originally and still a general term for a sitting meditation pose, and later extended in hath yoga and modern yoga as exercise to any type of pose or position adding reclining, standing, inverted ,twisting and balancing poses. In the figure, one can observe that poses can be related to representation of quadratic polynomial.



	(i) Name the shape of the poses shown.  	**1**
	(ii) Find the zeroes of the polynomial representing the graph given above.	**1**
	(iii) Frame a quadratic polynomial representing the graph given above.	**2**
	OR	
	If -1 is a zero of the polynomial $p(x) = kx^2 - 4x + k$, then find the value of k	