



K. R. MANGALAM WORLD SCHOOL, GK-II

MID TERM EXAMINATION CLASS X (2025-26) MATHEMATICS SET 1

MM - 80

TIME : 3 Hrs

General Instructions:

1. This Question Paper has 5 Sections A-E.
2. Section A has 20 MCQs carrying 1 mark each.
3. Section B has 5 questions carrying 12 marks each.
4. Section C has 6 questions carrying 13 marks each.
5. Section D has 4 questions carrying 15 marks each.
6. Section E has 3 case based integrated units of assessment (14 marks each) with subparts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 3 Questions of 2 marks has been provided. An internal choice has been provided in one part of Section E.
8. Draw neat figures wherever required. Take $\pi = 22/7$ wherever required if not stated.

SECTION A			
Section A consists of 20 questions of 1 mark each.			
Q1.	The pair of equations $3x + 2y = 9$ and $6x + by = 18$ represent coincident lines, then value of b is:	(1)	
	(a) $4 = b$ (b) $3 = b$ (c) $b = 2$ (d) $12 = b$		
Q2.	The mode and mean are given by 12 and 15, respectively. Then the median is:	(1)	
	(a) 13.5 (b) 21 (c) 6 (d) 14		
Q3.	The sum of zeroes of quadratic polynomial $x^2 - 2kx + 15$ is 8, then value of k is:	(1)	
	(a) 2 (b) 3 (c) 4 (d) 15		
Q4.	$\sqrt{0.4}$ is a/an _____	(1)	
	(a) natural number (b) rational number (c) irrational number (d) integer		
Q5.	The quadratic equation $4x^2 - 2kx + 9 = 0$ has real and equal zeroes then k is:	(1)	
	(a) ± 2 (b) ± 3 (c) ± 6 (d) ± 16		
Q6.	A card is drawn from a well shuffled deck of cards. What is the probability that the card drawn is either a king or a queen?	(1)	
	(a) $\frac{11}{13}$ (b) $\frac{12}{13}$ (c) $\frac{2}{13}$ (d) $\frac{1}{13}$		
Q7.	The common difference of the A.P. whose n^{th} term is given by $a_n = 5n + 3$, is:	(1)	
	(a) 3 (b) 5 (c) $5n$ (d) 1		
Q8.	If 2 lines are parallel, then the pair of the equation representing these lines has:	(1)	
	(a) 1 solution (b) 2 solutions (c) No solution (d) Infinite solutions		
Q9.	What is the probability of getting atleast 2 tails in a toss of 3 coins?	(1)	
	(a) $\frac{1}{2}$ (b) $\frac{5}{8}$ (c) $\frac{3}{8}$ (d) $\frac{2}{3}$		
Q10.	If α, β are the zeroes of the polynomial $x^2 - 2 + x$, then $\frac{1}{\alpha} + \frac{1}{\beta}$ is:	(1)	
	(a) 2 (b) $\frac{1}{2}$ (c) $\frac{1}{-2}$ (d) -2		
Q11.	If $\frac{1}{3}$ is a root of quadratic equation $x^2 - mx - \frac{5}{4} = 0$, then the value of m is:	(1)	
	(a) -2 (b) -3 (c) 2 (d) 3		
Q12.	The zeroes of equation $x^2 + 1x + 3$ are:	(1)	
	(a) Real and unequal (b) Real and equal (c) Imaginary (d) real roots		

Q13.	The pair of equations $x = 0$ and $x = -7$ has (a) one solution (b) two solutions (c) no solution (d) infinitely many solutions	(1)																
Q14.	The probability of happening the event be x and that of the probability of not happening the event be y then relation between x and y is: (a) $x = y + 1$ (b) $x = y - 1$ (c) $x = y$ (d) $x + y = 1$	(1)																
Q15.	If two positive integers a and b are written as $a = x^3y^2$ and $b = xy^3$, x, y are prime numbers, then HCF (a, b) is: (a) xy (b) x^2y (c) xy^2 (d) x^3y^2	(1)																
Q16.	In the given data, the difference between the upper limit of the median class and the lower limit of the modal class is: <table border="1" style="margin: 10px auto;"> <thead> <tr> <th>C. L</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>65-85</td> <td>4</td> </tr> <tr> <td>85-105</td> <td>5</td> </tr> <tr> <td>105-125</td> <td>13</td> </tr> <tr> <td>125-145</td> <td>20</td> </tr> <tr> <td>145-165</td> <td>14</td> </tr> <tr> <td>165-185</td> <td>7</td> </tr> <tr> <td>185-205</td> <td>4</td> </tr> </tbody> </table> (a) 1 (b) 8 (c) 9 (d) 7	C. L	Frequency	65-85	4	85-105	5	105-125	13	125-145	20	145-165	14	165-185	7	185-205	4	(1)
C. L	Frequency																	
65-85	4																	
85-105	5																	
105-125	13																	
125-145	20																	
145-165	14																	
165-185	7																	
185-205	4																	
Q17.	For what value of ' x ', the value of the polynomial $f(x) = (x-3)^2 + 9$ is 9? (a) ± 3 (b) -3 (c) 3 (d) 0	(1)																
Q18.	If every term of the statistical data consisting of n terms is decreased by 7, then the mean of the data: (a) decreases by 7 (b) remains unchanged (c) increases by $7n$ (d) increases by 7	(1)																
Q19.	Statement A (Assertion): The HCF of two numbers is 36 and their product is 3888, then their LCM is 180. Statement R (Reason): For any two positive integers a and b , $HCF(a, b) \times LCM(a, b) = a \times b$ (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.	(1)																
Q20.	Statement A (Assertion): The mean, mode and median of grouped data will always be different. Statement R (Reason): Mean = sum of all observations/number of observations. (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.	(1)																
SECTION B																		
Section B consists of 5 questions of 2 marks each.																		
Q21.	Floor of a room is to be fitted with square marble tiles of the largest possible size. The size of the room is $10\text{ m} \times 7\text{ m}$. What should be the size of tiles required that has to be cut?	(2)																
Q22.	Find a relation between p and q , if one zero of $x^2 + px + q$ is 37 times the other. OR If one of the zero of the quadratic polynomial $f(x) = 4x^2 - 8kx - 9$ is negative of the other, then find the value of k .	(2)																

- Q24. If sum of three consecutive terms of A.P. is 30 and their product is 910. Find these three terms. (2)

OR

- Q24. Which term of the A.P.: 65, 61, 57, 53, is the first negative term? (2)
- Q25. Find the value(s) of k for which the pair of linear equations $2x + 3y = 7$ and $(k-1)x + (k+2)y = 3k$ have infinitely many solutions. (2)

- Q25. Form a quadratic polynomial whose zeroes are $\sqrt{2}$ and $\frac{1}{\sqrt{2}}$. (2)

SECTION C

Section C consists of 6 questions of 3 marks each.

- Q26. The sum of a two-digit number and the number formed by interchanging the digit is 132. If 12 is added to the number, the new number becomes 5 times the sum of the digits, find the number. (3)

OR

- Solve for x and y : $49x + 51y = 499$ and $51x + 49y = 501$.
- Q27. A cottage industry produces a certain number of toys in a day. The cost of production of each toy (in rupees) was found to be 55 minus the number of articles produced in a day. On a particular day, the total cost of production was Rs. 750. Find the number of toys produced in day. (3)

- Q28. A survey regarding the heights (in cm) of 50 girls of class Xth of a school was conducted and the following data was obtained: (3)

Height (in cm)	120-130	130-140	140-150	150-160	160-170	Total
Number of girls	2	8	12	20	8	50

Find mean height of girls.

- Q29. Prove that $\sqrt{2}$ is an irrational number. (3)

- Q30. If α and β are the zeroes of the polynomial $2x^2 - 4x + 8$, then find a quadratic polynomial whose zeroes are α^2 and β^2 . (3)

OR

Find the zeroes of the polynomial $4x^2 - 4x - 8$. Also, verify the relationship between the zeroes and coefficients.

- Q31. Find the probability that a number selected at random from the numbers 1, 2, 3, ..., 35 is a (3)
- Prime number
 - Multiple of 7
 - Multiple of 3 or 5

SECTION D

Section D consists of 4 questions of 5 marks each.

- Q32. If twice the son's age in years is added to the father's age, the sum is 70. But if twice the father's age is added to the son's age, the sum is 95. Find the ages of father and son. (5)

- Q33. If the roots of the quadratic equation in x are equal, prove that $\frac{a}{c} = \frac{b}{d}$. (5)
- $$(a^2 + b^2)x^2 - 2(ac + bd)x + (c^2 + d^2) = 0.$$

OR

Find two consecutive natural numbers whose product is 20.

- Q34. If 10 times the 10th term of an A.P. is equal to 15 times the 15th term, show that the 25th term of the A.P. is zero. (5)

OR

If the sum of the first n terms of an A.P. is given by $(4n - n^2)$, what is the first term (that is S_1)? What is the sum of first two terms? What is the second term? Similarly, find the 3rd, the 10th and the n th terms.

- Q35. The median of the following data is 28.5. Find the values of x and y , if the total frequency is 60. (5)

$$\begin{array}{r} 47 \\ \times 22 \\ \hline 94 \\ 940 \\ \hline 1038 \end{array}$$

$$\begin{array}{r} 749 \\ \times 47 \\ \hline 5243 \\ 29950 \\ \hline 35153 \end{array}$$

$$\begin{array}{r} 499 \\ \times 49 \\ \hline 4491 \\ 4990 \\ \hline 24451 \end{array}$$

$$\begin{array}{r} 49 \\ \times 49 \\ \hline 441 \\ 490 \\ \hline 2401 \end{array}$$

$$\begin{array}{r} 2401 \\ - 51 \\ \hline 2350 \end{array}$$

Class interval	Frequency
0-10	5
10-20	x
20-30	20
30-40	15
40-50	y
50-60	5

SECTION E

Case study-based questions are compulsory.

- Q36. John wants to participate in a 200 m race. He can currently run that distance in 51 seconds and with each day of practice it takes him 2 seconds less. He wants to do it in 31 seconds. (4)



Based on the above information, answer the following questions:

- The minimum number of days he needs to practice achieving the goal is. (1)
- The common difference of the A.P. having $a_n = 2n + 3$ as n^{th} term is. (1)
- Find out the A.P. for the given situation. (2)

OR

- Find out the value of x , for which $2x$, $x + 10$, $3x + 2$ are three consecutive terms of an A.P.
- Q37. Raj and Ajay are very close friends. Both the families decide to go to Ranikhet by their own cars. Raj's car travels at a speed of x km/h while Ajay's car travels 5 km/h faster than Raj's car. Raj took 4 hours more than Ajay to complete the journey of 400 km. (4)



Based on the above information and referring to the above diagram, answer the following questions.

- What will be the distance covered by Ajay's car in two hours? (in terms of x) (1)
- Form a quadratic equation to describe the speed of Raj's car? (1)
- What is the speed of Raj's car? (2)

OR

How much time took Ajay to travel 400 km?

- Q38. Rahul and Ravi planned to play Business (board game) in which they were supposed to use two dice. (4)



- i. Ravi got first chance to roll the dice. What is the probability that he got the sum of the two numbers appearing on the top face of the dice is 8? (1)
- ii. Rahul got next chance. What is the probability that he got the sum of the two numbers appearing on the top face of the dice is 13? (1)
- iii. Now it was Ravi's turn. He rolled the dice. What is the probability that he got the sum of the two numbers appearing on the top face of the dice is less than or equal to 12? (2)

OR

Rahul got next chance. What is the probability that he got the sum of the two numbers appearing on the top face of the dice is at most 7?