







Date: 01/08/23
GRADE: XI

MONTHLY TEST -01 (2023-24)
MATHEMATICS

Max marks: 20
Time: 50min

General Instructions:

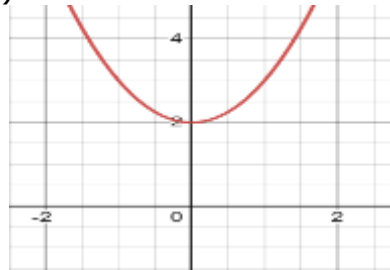
- 1) Questions 1 to 4 carries 1 mark each.
- 2) Questions 5 to 8 carries 2 marks each.
- 3) Questions 9 and 10 carries 4 marks each.
- 4) All questions are compulsory.

Qn. No	SECTION A	Marks allocated
1	Convert 1845 degree to radian measure a) $\frac{41\pi}{4}$ b) $\frac{39\pi}{4}$ c) $\frac{41\pi}{3}$ d) $\frac{27\pi}{4}$	1
2	The interval $(a, b]$ is represented on the number line as (a)  (b)  (c)  (d) 	1
3	The domain and range of the relation R given by $R = \{(x, y) : y = x + \frac{6}{x}; \text{ where } x, y \in \mathbb{N} \text{ and } x < 6\}$ is (a) $\{1, 2, 3\}, \{7, 5\}$ (b) $\{1, 2\}, \{7, 5\}$ (c) $\{2, 3\}, \{5\}$ (d) None of these	1

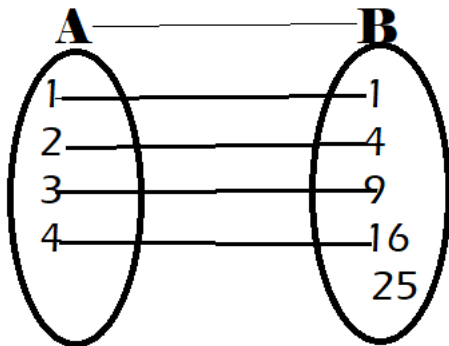
4	<p>DIRECTION: In the following question, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as: (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A). (b) Both assertion (A) and reason (R) are true but reason (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</p> <p>Assertion:</p> <p>If $A = \{1, 2, 3\}$, $B = \{3, 4\}$ and $C = \{4, 5, 6\}$, then $(A \times B) \cup (A \times C) = \{(1, 3), (1, 4), (1, 5), (1, 6), (2, 3), (2, 4), (2, 5), (2, 6), (3, 3), (3, 4), (3, 5), (3, 6)\}$.</p> <p>Reason:</p> <p>$A \times A \times A = \{(a, b, c) : a, b, c \in A\}$. Here (a, b, c) is called an ordered triplet.</p>	1
SECTION B		
5	$\sin \theta = \frac{7}{25}$ and θ lies in the second quadrant, find the value of $\tan \theta$ and $\sec \theta$	2
6	Find the length of an arc of a circle of radius 5cm subtending a central angle measuring 15° .	2
7	<p>Verify De'Morgan's laws :-</p> <p>$U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$</p> <p>$A = \{1, 3, 4, 5, 7, 9, 10\}$</p> <p>$B = \{1, 3, 4, 5, 7, 8, 10\}$</p>	2
8.	Draw a rough sketch of the function $y = x^2 + 2$ and write its domain & range.	2
SECTION C		
9.	<p>A mathematics teacher Mamta writes 3 sets, $A = \{1, 3, 5, 7, 9\}$ $B = \{2, 4, 6, 8\}$, $C = \{2, 3, 5, 7, 11\}$, $U = \{1, 2, 3, \dots, 11\}$ Answer the following questions which are based on the above sets</p> <p>a) $A \cap (C - B)$ b) $A' \cap B'$ c) $(A - C) \cup (B - C)$ d) $A \cup (C - A)$</p>	4

10.	<p>Let $A = \{1,2,3,4\}$, $B = \{1,4,9,16,25\}$ and R be a relation defined from A to B as,</p> <p>$R = \{(x, y): x \in A, y \in B \text{ and } y = x^2\}$</p> <p>(a) Depict this relation using arrow diagram. (b) Find domain of R. (c) Find range of R. (d) Write co-domain of R.</p>	4
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ANSWERS: 1) a 2) c 3) a 4) b 5) $-7/24 ; -25/24$ 6) $55/42$
 7) $(A \cup B)^c = A^c \cap B^c = \{2,6\}$ ii) $(A \cap B)^c = A^c \cup B^c = \{2,6,8,9\}$
 8) Domain = \mathbb{R} , Range = $[2, \infty)$



9) i) $\{3,5,7\}$ ii) $\{10,11\}$ iii) $\{1,4,6,8,9\}$ iv) $\{1,2,3,5,7,9,11\}$
 10) a)



- b) $\{1,2,3,4\}$
- c) $\{1,4,9,16\}$
- d) $\{1,4,9,16,25\}$