INDIAN SCHOOL SOHAR **SET I**

UNIT TEST I (2024-25)
MATHEMATICS

CLASS: XI **MAX. MARKS: 20**
DATE: 23/05/24 **TIME: 40 MINUTES**

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 4 MCQ's and 1 Assertion-Reason based questions of 1 mark each.
3. Section B has 2 Very Short Answer (VSA)-type questions of 2 mark each.
4. Section C has 2 Short Answer (SA)-type questions of 3 mark each.
5. Section D has 1 Long Answer (LA)-type questions of 5 marks.

	SECTION – A (Multiple Choice Questions) Each question carries 1 mark
1.	For any 2 sets A and B, $A \cap (A \cap B)'$= (a) A (b) B (c) $\emptyset$ (d) $A \cap B'$
2.	Let the universal set contain 700 elements. If A and B are subsets of U such that n(A) = 200, n(B) = 400, n(A∩B) = 100. Then n $(A' \cap B')$ is (a) 200 (b) 500 (c) 300 (d) none of these
3.	Let R be a relation on the set A = {1, 2, 3, 4, 5, 6, 7, 8, 9} defined by R = { (x,y) : y = 3x }, then R is (a) { (3, 1), (6, 2), (8, 2), (5, 2) } (b) { (3, 1), (6, 2), (9, 3) } (c) { (3, 1), (2, 6), (3, 9) } (d) none of these
4.	The range of the function $f(x) = \frac{x+2}{\lvert x+2 \rvert}$, $x \neq -2$ is (a) { -1, 1 } (b) { -1, 0, 1 } (c) { 1 } (d) none of these
5.	Assertion – Reason based question. In the following question, a statement of assertion (A) is followed by a statement of reason (R). Choose the correct answer out of the following choices. (a) Both A and R are true and R is correct explanation of A. (b) Both A and R are true and R is not correct explanation of A. (c) A is true but R is false. (d) A is false but R is true. Assertion (A) : Let A be the set of natural numbers and B = { 40, 66, 70, 100} then $B - A = \phi$ Reason (R) : If $A \subset B$, then $A \cup B = A$
	SECTION – B [This section comprises of very short answer type questions (VSA) of 2 marks each]
6.	Find the angle in degrees through which a pendulum swings if its length is 75cm and the tip describes an arc of length 21 cm. **[OR]** Find the radius of the circle in which a central angle of 30° intercepts an arc of length 37.4 cm. (Use $\pi = \frac{22}{7}$)
7.	Let f(x) = $x^2 - x$ and g(x) = x be two real functions defined on positive real numbers. Find (f + g)(x) and $\left(\frac{f}{g}\right)$(x). Hence find (f + g)($\frac{3}{2}$) and $\left(\frac{f}{g}\right)$(2)

	SECTION – C [This section comprises of short answer type questions (SA) of 3 marks each]
8.	A and B are any two sets such that n(A – B) = 14 + x, n(B – A) = 3x and n($A \cap B$) = x. Draw a Venn diagram to illustrate the information. If n(A) = n(B), then find (i) value of x. (ii) n($A \cup B$) **[OR]** Let U = { x ∈ N : x ≤ 8 }, A = { x ∈ N : 5 < x^2 < 50 } and B = { x ∈ N : x is prime number less than 10 } C = { x ∈ N : x^3 < 9 } Verify $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$
9.	Express the following angles in degrees (a) $-\frac{24\pi}{3}$ (b) 6
	SECTION – D [This section comprises of long answer type questions (LA) of 5 marks]
10.	Find the domain and range of (a) $f(x) = \frac{1}{\sqrt{x-5}}$ (b) $f(x) = \sqrt{x^2 - 4}$ **[OR]** Define Modulus function and Signum function. Write their domain and range. Also draw rough sketch of both the graphs.