**Bhartiyam International School**

 **Pre – Mid Term Assessment (2022-23)
Subject: Mathematics ( Set 01)**

**Class: XI**

**Date: 05/08/2022 Max. Marks: 40
Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Roll No: \_\_\_\_\_\_ Duration: 90 mins.**

**General Instructions**:

* This question paper contains **four sections*–* A, B, C, and D**. Each part is compulsory.
* **Section - A** has 6 **very short answer type (VSA) questions** of 1 mark each.
* **Section *-* B** has 5 **short answer type (SA1) questions** of 2 marks each.
* **Section *-* C** has 3 **short answer type (SA2) questions** of 3 marks each
* **Section - D** has 3 **long answer type questions (LA)** of 5 marks each.

**SECTION – A**

1. Find the domain of the function $log\left(2x-1\right).$ 1
2. Write the following sets in the roster form A = {x : x is a positive integer less than 10 and

$2^{x}$ – 1 is an odd number} 1

1. Let U = {1, 2, 3, 4, 5, 6, 7}, A = {2, 4, 6}, B = {3, 5} and C = {1, 2, 4, 7}, find A′ ∪ (B ∩ C′) 1
2. Express the function f: A—R. $f\left(x\right)=x^{2}-1$. Where A = {-4, 0, 1, 4} as a set of ordered pairs. 1
3. Draw the graph of the function f: R → R defined by $f\left(x\right)=x^{3}$, x ∈ R 1
4. In a city 20 percent of the population travels by car, 50 percent travels by bus and 10 percent travels by both car and bus. Then persons travelling by car or bus is ­\_\_\_\_\_\_\_\_. 1

**SECTION – B**

1. If n (A - B) = 18, n(A ∪ B) = 70 and n(A ∩ B) = 25, then find n(B). 2
2. The Cartesian product A × A has 9 elements among which are found (–1, 0) and (0, 1). Find the set A and the remaining elements of A × A. 2
3. State whether the following are true or false.
4. The set of letters in the word MASTER is finite.
5. The set of vowels in the word PLANET is an empty set.
6. {0} represents a null set.
7. Equivalent sets are always equal. 2
8. Find the domain for which the functions$f\left(x\right)=\frac{1}{\left(2x^{2}-1\right)} and g\left(x\right)=1-3x$. 2
9. If A = {a, b, c, d}, B = {c, d, e, f} and C = {b, d, f, g}; Find:
10. A $∩$ B b) (A $∩$ B) ∪ (A $∩$ C) 2

**SECTION – C**

1. **Draw the Venn Diagram of the following**
2. $(A∪B)^{'} b) (A∩B)^{'} c)(A-B)$ **3**
3. Assume that A = {1, 2, 3,…, 14}. Define a relation R from A to A by R = {(x, y ) : 3x – y = 0, such that x, y ∈ A}. Determine and write down its range, domain, and co-domain. 3
4. State, giving reasons, which of the following pairs of sets are disjoint sets or overlapping sets: 3
5. A = {Girls with ages below 15 years} and B = {Girls with ages above 15 years}
6. A = {Boys with ages above 20 years} and B = {Boys with ages above 27 years}
7. A = {Naturals numbers between 35 and 60} and B = {Naturals numbers between 50 and 80}

**SECTION – D**

1. In a competition, a school awarded medals in different categories. 36 medals in dance, 12 medals in dramatics and 18 medals in music. If these medals went to a total of 45 persons and only 4 persons got medals in all the three categories, how many received medals in exactly two of these categories? 5
2. Let R be a relation from N to N defined by R = {(a, b): a, b ∈ N and a = b2}. Are the following true?
3. (a, a) ∈ R, for all a ∈ N
4. (a, b) ∈ R, implies (b, a) ∈ R
5. (a, b) ∈ R, (b, c) ∈ R implies (a, c) ∈ R. ­ 5
6. Find the domain of the following function

$log\_{4}[log\_{5}\{log\_{3}(18x-x^{2}-77)\}].$ 5