**Bhartiyam International School**

**Pre – Mid Term Assessment (2022-23)
 Subject: Mathematics (Set 02)**

 **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 $log\left(4x-1\right).$ 1
2. Write the following sets in the roster form A = {x : x is a positive integer less than 10 and $4x$ – 1 is an odd number} 1
3. 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
4. Express the function f: A—R. $f\left(x\right)=2x^{3}-1$. Where A = {-4, 0, 1, 4} as a set of ordered pairs. 1
5. Draw the graph of the function f: R-{0} → R defined by$ f\left(x\right)=1/x^{2 }$. 1
6. In a city 30 percent of the population travels by car, 50 percent travels by bus and 60 percent travels by bus or car. Then persons travelling by both car and bus is \_\_\_\_\_\_\_\_. 1

**SECTION – B**

1. If n (A - B) = 18, n(A ∪ B) = 70 and n(A ∩ B) = 25, then find n(A). 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. 10 ∉ set of multiples of 5.
5. 4 ∈ {x : 4 ≤ x ≤ 10}
6. If two sets are equal, they are also equivalent.
7. If P = {x : x = 2n, n ∈ N} 2
8. Find the domain for which the functions$f\left(x\right)=\frac{1}{\left(2x^{2}-x-3\right)} and g\left(x\right)=\sqrt{2-3x}$. 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. $(A∪B)^{'} b) (A'∩B')^{'} c)(B-A)$ **3**
3. Assume that A = {1, 2, 3,…, 14}. Define a relation R from A to A by R = {(x, y) : 3x +1 = y , 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:
5. A = {Students of class X studying in California} and B = {Students of class X}
6. A = {Naturals numbers multiples of 3 and less than 30} and B = {Natural numbers divisible by 4 and between 20 and 45}
7. A = {Letters in the word ‘MOON’} and B = {Letters in the word ‘STAR’} 3

**SECTION – D**

1. Find the domain of the following function

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

1. Let R be a relation from N to N defined by R = {(a, b): a, b ∈ Z and a - b is a multiple of 2}. Are the following true?
2. (a, a) ∈ R, for all a ∈ Z
3. (a, b) ∈ R, implies (b, a) ∈ R
4. (a, b) ∈ R, (b, c) ∈ R implies (a, c) ∈ R. 5
5. In a survey of 80 people, it was found that 35 people read newspaper H, 20 read newspaper T, 15 read the newspaper I, 5 read both H and I, 10 read both H and T, 7 read both T and I, 4 read all three newspapers. Find the number of people who read
6. at least one of the newspapers?
7. Only H newspaper
8. Exactly two newspaper
9. Exactly one newspaper
10. At most two newspaper 5