## **Assignment – I**

**Department:** Department of Computer Engineering & Applications

**Course:** B. Tech (CSE) **Year/Semester:** II/ III **Session:** 2020-21

**Subject Name & Code:** Discrete Mathematics (BCSC0010)

Q1. (i) Write the following sets in roster form:

(a) (b)

(ii) Write the following sets in set builder form:

(a)

(b)

Q.2. Which of the following are the examples of an empty set?

(a) The set of even natural numbers divisible by 3.   
  
(b) The set of all prime numbers divisible by 2.   
  
(c) {x : x ∈ N, 5 < x < 6}

Q.3. Determine the number of integers between 1 and 250 that are divisible by any of the integers

2, 3, 5 and 7.

Q.4. Using Venn diagram, test the validity of the following arguments:

(a) All guilty people will be arrested. All thieves are guilty people. Therefore, all thieves will

be arrested.

(b) All arrested people are thieves. All thieves are guilty people. Therefore, all guilty people

are arrested.

Q.5. Let and , then find out the relation from to defined by:

(a) “is less than or equal to” (b) “is less than”. Also find domain and range of the relations.

Q.6. Let . Consider the relation on given by

.

Test, whether is (a) reflexive (b) symmetric (c) transitive (d) equivalence?

Q.7. Let *A* be a set of nonzero integers and let ≈ be the relation on *A* × *A* defined by

*(a, b)* ≈ *(c, d)* whenever *ad* = *bc.* Prove that ≈ is an equivalence relation.

Q.8. Solve the following recurrence relations :

(i)

(ii) .

Q.9. Find the particular solution of the following recurrence relations :

(i)

(ii)

Q.10. Find the generating functions of the following sequences :

(i) (ii) .

Q.11. Find the numeric function of the following generating functions :

(i) (ii)

Q.12. Solve the following recurrence relations using generating functions :

(i)

(ii)