Name:
Student University Roll No.:

School of Engineering

First Sessional Examination, Odd Semester (AS: 2023-24)

B. Tech: Computer Science & Engineering Year:I Sem:III

Course Title: Discrete Mathematics | M.M.: 30

Course Code: BCS 3301 | Time: 1 *hr*

Read the question Carefully.

	SECTION 'A'	Course Objective	Marks
Q.N.1. Attempt all parts of the following:			
a)	Let A= {a, b, c}, B={x, y}, C={0, 1}. Find C ×B ×A	CO1	1
b)	What is the difference in relation and function?	CO1	1
c)	Give an example of a relation which is neither reflexive nor symmetric	CO1	1
d)	Find the power set of {Ø, {Ø}}	CO2	1
e)	What are the recursively defined functions?	CO1	1
	SECTION 'B'	**Course Objective**	**Marks**
Q.N.2. Attempt any two parts of the following:			
a)	For any three non empty set A, B, and C prove that $A \times (B \cap C) = (A \times B) \cap (A \times C)$	CO1	7.5
b)	Show that the mapping f: R → R defined by f(x) = 3x + 5 is bijective where R is a set of real numbers.	CO1	7.5
c)	Use mathematical induction to prove that $2^n < n!$ for every integer n with $n \geq 4$	CO2	7.5
d)	Use set builder notation to give a description of each of these sets. a) {0, 3, 6, 9, 12} b) {−3,−2,−1, 0, 1, 2, 3} c) {m, n, o, p}	CO2	7.5
	SECTION 'C'	**Course Objective**	**Marks**
Q.N.3. Attempt any one part of the following			
a)	Prove that $\sqrt{2}$ is irrational by giving a proof by contradiction.	CO1	10
b)	Find the transitive closures of following relation defined on the set {a, b, c, d, e}. {(a, b), (a, c), (a, e), (b, a), (b, c), (c,a), (c,b), (d,a),(e,d)}	CO1	10
c)	Prove that : $A - (B \cap C) = (A - B) \cup (A - C)$	CO2	10

Table 1: Mapping between COs and questions

COs	Questions Numbers	Total Marks
CO1	1.b,1.c,1.e, 2.a,2.b,2.c,3.a,3.b	39
CO2		