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Student University Roll No.:

School of Engineering
Second Theory Sessional Examination
Odd Semester (AS: 2024-25)

B. Tech: CSE, AI, IOTBC,CCML **[Year:II]** **[Semester :III]**

Course Title: Discrete Mathematics **Max Marks: 30**

Course Code: NCS 4301 **Time: 1hrs**

Instructions if any: Read the question Carefully.

	SECTION 'A' Q.N.1. Attempt all parts of the following:	Course Objective	Marks
a)	Differentiate complemented lattice and disturbed lattice.	CO2	1
b)	Define Monoid with example.	CO2	1
c)	Define universal Quantifiers and existential Quantifiers.	CO3	1
d)	Define Recurrence relation with example.	CO4	1
e)	Define Order of an element of a Group with example	CO2	1

	SECTION 'B' Q.N.2. Attempt any two parts of the following:	Course Objective	Marks
a)	If inverse of an element "a" in a group is "a^{-1}", then the inverse a^{-1} is a ,i.e.$(a^{-1})^{-1} = a$.	CO2	7.5
b)	Prove the following Equivalence: $P \rightarrow (Q \vee R) \equiv (P \rightarrow Q) \vee (P \rightarrow R)$	CO3	7.5
c)	How many people must you have to guarantee that at least 5 of them will have birthday on the same month.	CO4	7.5

	SECTION 'C' Q.N.3. Attempt any one part of the following:	Course Objective	Marks
a)	Prove that the set S = {0,1,2,3} forms a ring under addition and multiplication modulo 4	CO2	10
b)	Solve the recurrence relation $a_{r+2} - 5a_{r+1} + 6a_r = 2$ given that $a_0 = 3$ and $a_1 = 7$.	CO4	10
c)	Draw the Hasse Diagram of D_{30}	CO2	10

Table 1: Mapping between COs and questions

Cos	Questions Numbers	Total Marks
CO2	1.a,1.b,1.e,2.a,3.a,3.c	30.5
CO3	1.c,2.b	8.5
CO4	1.d,2.c,3.b	18.5