


National University of Computer and Emerging Sciences, Lahore Campus				
	Course:	Discrete Structures	Course Code:	CS1005
	Program:	BSE	Semester:	Spring 22
	Duration:	180 mins	Total Marks:	30
	Paper Date:	24-03-2022	Weightage	15
	Section:	2A, 4A, 4B	Page(s):	01
	Exam:	Mid-I	Roll No:	20L-1080
Instruction/Notes:		Attempt All Questions		

1. Whether $(\neg q \wedge (p \rightarrow q)) \rightarrow \neg p$ is tautology or not? Prove or disprove it. (5)
- ✓ 2. Translate each of these statements into logical expressions using predicates, quantifiers and logical connectives. Let the domain consist of all people. (6)
 - a. Someone in your class can speak Urdu.
 - b. Everyone in your class is friendly.
 - c. There is a person in your class who was not born in Pakistan.
- ✓ 3. Explain the rules of inference and draw conclusion. (5)

"If I eat spicy foods, then I have strange dreams." "I have strange dreams if there is thunder while I sleep." "I did not have strange dreams."
- ✓ 4.
 - a. Find a counterexample, if possible, to this universally quantified statement, where the domain for all variables consists of all integers. (4)

$$\forall x \exists y (y^2 - x < 1000)$$
 - b. Negate the following statement:
If n is even, then $\frac{n}{2}$ is an integer.
5. Prove the distributive law $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$ without using membership table. (6)
- ✓ 6. Translate following by using logical connectives: (4)
 - a. You get an A on the final, but you don't do every exercise in this book nevertheless, you get an A in this class.
 - b. The difference of two negative integers is not necessarily negative.

GOOD LUCK