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| **National University of Computer and Emerging Sciences, Lahore Campus** | | | | |
| C:\Users\saif\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\final design.jpg | **Course:** | **Discrete Structures** | **Course Code:** | **CS1005** |
| **Program:** | **BS- CS** | **Semester:** |  |
| **Section:** | **4L** | **Total Marks:** | **30** |
| **Submission deadline:** | **24-2-2023** | **Weight** | 3.3 |
| **Assignment:1** | | **Page(s):** | 2 |
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| **Instruction/Notes:** | 1. Understanding of the problems is part of the assignments. So no query please. 2. You will get Zero marks if found any type of cheating. 3. 25 % deduction of over marks on the one day late submission after due date 4. 50 % deduction of over marks on the two day late submission after due date 5. No submission after two days. 6. MUST BE HAND WRITTEN. | | | |

**Question 1 : Which of these are propositions? What are the truth value of those that are proposition?**

**(1 Mark for each)**

1. 2+3 = 5
2. 4 + x = 5
3. There is no pollution in Pakistan.
4. The moon is made of green cheese.
5. 2n ≥ 100
6. Answer this question.

**Question 2 :** Write **Inverse, Converse** and **Contrapositive, also apply implication law** on the following statements: **(1 Mark for each)**

1. If it snows today. I will ski tomorrow.
2. I come to class whenever there is going to be a quiz.
3. I go to the beach whenever it is a sunny summer day.
4. When I stay late, it is necessary that I sleep until noon.

**Question 3 : Let *p* and *q* be the propositions. (1 Mark for each)**

p: “I bought a lottery ticket.”

q: “I won the million dollar jackpot on Friday.”

Express each of these propositions as an English sentence.

a)￢*p* b)￢*p* →￢*q*

c)*p* ↔*q* d)￢*p* ∨(p ˄ q)

**Question 4: Let *p*, *q*, be the propositions (1 Mark for each)**

***p*** :You drive over 65 miles per hour.

***q*** :You get a speeding ticket.

Write these propositions using *p* and *q* and logical connectives.

a)You will get a speeding ticket if you drive over 65 miles per hour.

b)If you do not drive over 65 miles per hour, then you will not get a speeding ticket.

c)you get a speeding ticket, but you do not drive over 65 miles per hour.

d)Driving over 65 miles per hour is sufficient for getting a speeding ticket.

**Question 5: By using the rules of logical equivalences, show the propositions are logically equivalent: (2 Marks for each)**

1. (s → r) ∧ (q → r) and (s ∨ q) → r
2. [(p → q) /\ (q → r)] → (p → r) is Tautology
3. [(p v q) /\ (~p V r)]→ (q V r) is Tautology.
4. Determine whether (p → (q → r)) → ((p ˄ q) → r)is Tautology.

**Question 6:** What is the logical translation of the following statement? **(1 Marks for each)**

"None of my friends are perfect."

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