FIRST SEMESTER M.Sc. DEGREE EXAMINATION, NOVEMBER 2019

(CUCSS PG)

CC19P CSS1 C01 - DISCRETE MATHEMATICAL STRUCTURES

(Computer Science)

(2019 Admission Regular)

Time: Three Hours   Maximum: 30 Weightage

PART A

Answer any *four* questions. Each question carries 2 weightage.

1. What is a lattice? Give an example.

2. Differentiate between universal and existential quantifiers.

3. Prove that $n(A \cup B) = n(A) + n(B) - n(A \cap B)$ for any two sets A and B.

4. Define isomorphism in group theory.

5. What do you mean by tautology? Show that $pv \sim p$ is a tautology using truth table.

6. Give example of a relation that is symmetric, transitive but not reflexive.

7. Compare cycle and circuit. Give examples for each.

(4 x 2 = 8 Weightage)

PART B

Answer any *four* questions. Each question carries 3 weightage.

8. Explain connectedness in graph theory.

9. Show that $(Z, +)$ is a group.

10. Define distributive and complemented lattices.

11. What are the different types of functions in set theory?

12. Compare Eulerian and Hamiltonian graphs with suitable examples.

13. Construct the Hasse diagram for $(\{3, 4, 12, 24, 48, 72\}, /)$.

14. Explain principal conjunctive and principal disjunctive normal forms.
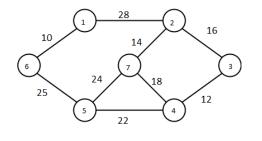
(4 x 3 = 12 Weightage)

PART C

Answer any *two* questions. Each question carries 5 weightage.

15. Explain complete bipartite graph. Is $k_{4,3}$ is bipartite?

16. What do you mean by equivalence relation? Give an example.

17. Define:

a) Permutation group   b) Semi group   c) Monoid

d) Field   e) Ring

18. Find a minimal spanning tree using kruskal's algorithm.

(2 x 5 = 10 Weightage)

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