D1ACS2101 **(2 Pages)** **Name.....**
Reg.No.....

FIRST SEMESTER M.Sc. DEGREE EXAMINATION, NOVEMBER 2021
(Regular/Improvement/Supplementary)

COMPUTER SCIENCE
FCSS1C01 – DISCRETE MATHEMATICAL STRUCTURES

Time: 3 Hours **Maximum Weightage: 30**

Section A: Short answer questions. Answer any *four* questions. Each carries *two* weightage.

1. State the inverse and contrapositive: if P is a square, then P is a rectangle.
2. Describe disjunctive normal form with example?
3. Define poset with example.
4. What are the two binary operations defined for lattices?
5. What is the difference between an integral domain and a field?
6. What makes an Euler circuit?
7. Define a complete graph.

(4×2 = 8 weightage)

Section B: Short essay questions. Answer any *four* questions. Each carries *three* weightage.

8. Explain about Homeomorphism and Isomorphism.
9. Prove that $(p \rightarrow r) \wedge (q \rightarrow r) \equiv (p \vee q) \rightarrow r$
10. Explain about Bipartite Graph. Give example.
11. Explain about Principle of duality.
12. What is relation? Explain properties of relation with examples.
13. What is pigeonhole principle? Explain the significance of pigeonhole principle with example.
14. State the rules of inferences. What is the difference between modus ponens and modus tollens?

(4×3 = 12 weightage)

(P.T.O.)

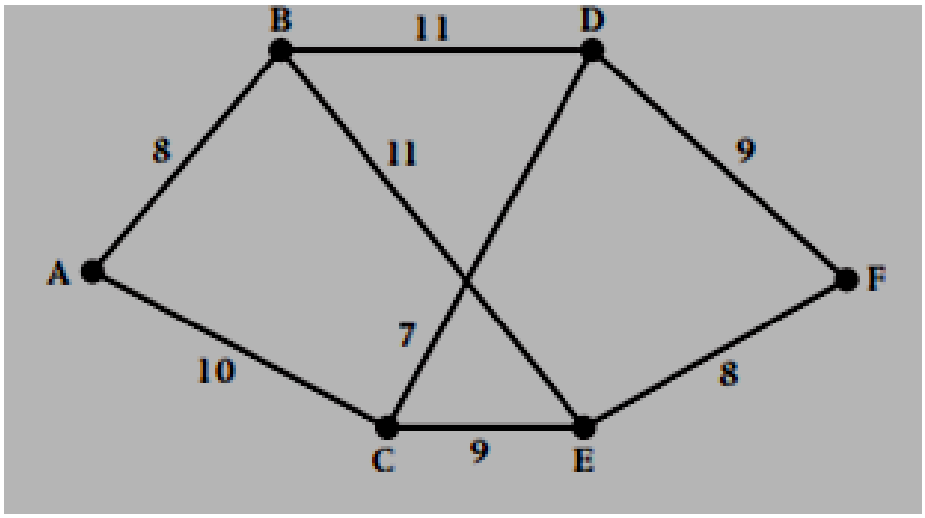
Section C: Essay questions. Answer any *two* questions. Each carries *five* weightage.

15. Define Distributive and Complemented lattices. Give examples. Prove that in a distributive lattice if an element has a complement, then this complement is unique.

16. Write an essay on Lagrange's principle.

17. Explain the construction steps of Hasse Diagram. Let A= {1,3,9,27.81} draw Hasse diagram of the poset (A,/).

18. Explain Dijkstra's algorithm and find shortest route from one part of the diagram to another:



(2×5 = 10 weightage)