D 52791 **(Pages : 2)** **Name.....**

Reg. No.....

FIRST SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2023

(CBCSS)

Computer Science

CSS 1C 01—DISCRETE MATHEMATICAL STRUCTURES

(2019 Admission onwards)

Time : Three Hours Maximum : 30 Weightage

Part A

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

1. Define well formed formula
2. Write predicates for the following sentences :
   (i) Some rivers in India are polluted.
   (ii) All students are intelligent.
3. Give definition for one-to one function with an example.
4. Describe Lattice.
5. Define Ring.
6. What do you mean by a Bipartite Graph ?
7. What is a Walk in graph theory ?

(4 × 2 = 8 weightage)

Part B

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

8. Prove that $(P \to Q) \Leftrightarrow (\neg P \vee Q)$.
9. Give a note on quantifiers. Give suitable examples.
10. Define equivalence relation with the help of suitable example.

Turn over

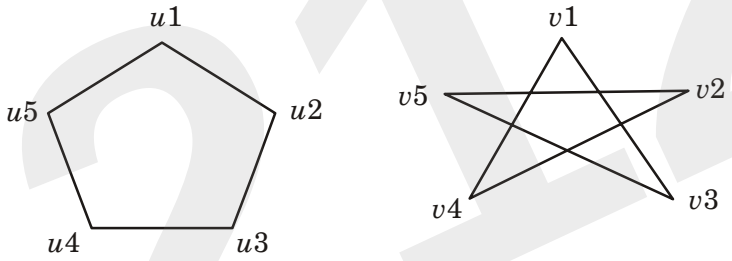
11. Explain Pigeon Hole Principle.
12. Define a subgroup and group homomorphism.
13. What do you mean by a monoid. Give example.
14. Define a tree. Prove that a graph is a tree if and only if there is exactly one path between every pair of vertices.

(4 × 3 = 12 weightage)

Part C

Answer any **two** *questions.*

15. Show that SVR is tautologically implied by $(P \vee Q) \wedge (P \rightarrow Q) \vee (Q \rightarrow S)$.
16. Draw Hasse diagram $(D_{36}, /)$ where / is the division relation.
17. Prove that identity element in a group is unique.
18. Define isomorphism. Determine whether the following space pair of graphs are isomorphic :



(2 × 5 = 10 weightage)