H.T.No. | | | | | | | | | | |

Code No: MA1506 **GEC-R14**

II B. Tech I Semester Regular / Suppl. Examinations, November 2017

DISCRETE MATHEMATICAL STRUCTURES

(Common to Computer Science and Engineering & Information Technology)

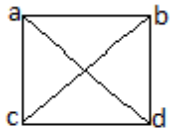
Time: 3 Hours **Max. Marks: 60**

Note: All Questions from **PART-A** are to be answered at one place.
Answer any **FOUR** questions from **PART-B.** All Questions carry equal Marks.

PART-A

6 × 2 = 12M

1. What is Tautology? Write an example.
2. Draw the Hasse Diagram representing the positive divisors of 45.
3. Define Lattice and group.
4. Distinguish between Hamiltonian graphs and Eulerian graphs.
5. What is a Spanning Sub Graph and write any two spanning sub graphs of the following graph.



6. List out different methods used for solving the recurrence relations.

PART-B

4 ×12 = 48M

1. a) Show that the following formula is a tautology
$((P \vee Q) \wedge \neg(\neg P \wedge (\neg Q \vee \neg R))) \vee (\neg P \wedge \neg Q) \vee (\neg P \wedge \neg R)$ (6M)

   b) Symbolize the expressions

   i) All the world loves a lover

   ii) All men are giants

   iii) Every blue cover book is MFCS book (6M)

2. a) N= the set of natural numbers. R = {(a,b) / a,b∈N, 7 divides 3a+4b}. Find whether R is a partial order relation. (6M)

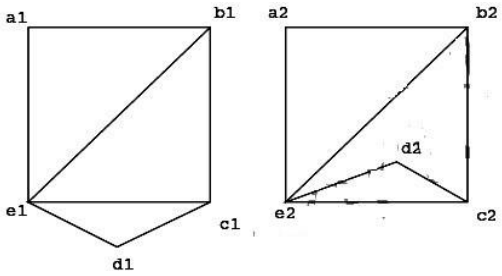
   b) Let $R = \{(1,2),(3,4),(2,2)\} and S = \{(4,2),(2,5),(3,1),(1,3)\}$.

   Find $R°S, S°R, R°(S°R), (R°S)°R, R°R, S°S$ (6M)

3. a) Show that the set N of natural numbers is a semi group under the following operation x * y = max{x, y}. Is it a Monoid? (6M)

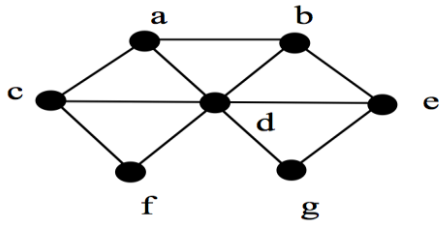
   b) Define Sub graph, Semi group and Monoid. (6M)

4. Is the given graphs are Isomorphic, verify and write the rules for Isomorphic. (12M)



5. a) Explain DFS approach for finding a spanning tree of the graph. (6M)

b) Find the chromatic number of the following graph. (6M)



6. Solve the recurrence relation a_n-9a_{n-1}+26a_{n-2}-24a_{n-3}= 3 for n≥3. (12M)

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