PVP 14

Code: CS3T1

II B.Tech - I Semester–Regular/Supplementary Examinations
November 2016

DISCRETE MATHEMATICS
(COMPUTER SCIENCE AND ENGINEERING)

Duration: 3 hours Max. Marks: 70

PART – A

Answer ***all*** the questions. All questions carry equal marks

11x 2 = 22 M

1.

a) Define Well formed Formulae with an Example.
b) Find Duality for A: $(P \rightarrow R) \wedge (Q \rightarrow S)$.
c) Construct the CNF of $P \wedge (P \rightarrow Q)$.
d) What is meant by Axiom Schema?
e) Draw the Hasse Diagram for the Given Relation R={(1,1),(2,2),(3,3),(1,4),(3,1),(3,2),(3,4)}.
f) Define Lattice. What are its types?
g) Define homomorphism with an Example.
h) Differentiate Bi-partite and Complete Bi-partite graphs.
i) What is Edge-Disjoint and Vertex-Disjoint sub graphs?
j) Draw a binary tree whose level order indices are {1,2,4,5,8,10,11,20}
k) Write the rules for constructing Hamilton Paths and Cycles.

PART – B

Answer any ***THREE*** questions. All questions carry equal marks.

3 x 16 = 48 M

2.

a) Prove that $\neg P \leftrightarrow Q \Leftrightarrow (P \vee Q) \wedge (P \wedge Q)$. 8 M

b) Obtain the PCNF of the formula A given by $(\neg P \rightarrow R) \wedge (Q \leftrightarrow P)$ and hence find PDNF of A? 8 M

3.

a) Describe in detail about Automatic Theorem Proving. 8 M

b) Apply Automatic Theorem Proving to show that S V R is tautologically Implied by $(P \vee Q) \wedge (P \rightarrow R) \wedge (Q \rightarrow S)$. 8 M

4.

a) Draw the Hasse diagram representing the positive integers of 24. Find Minimal, Maximal, Greatest and Least elements. 8 M

b) If A={1,2,3,5,30} and R is the divisibility relation, prove that (A,R) is a lattice. Check whether this is a distributive lattice or not. 8 M

5.

a) Illustrate isomorphism of graphs with an example. 8 M

b) Demonstrate Depth first Search Algorithm with an Example. 8 M

6.

a) Show that a graph of 8 M
   i) Order 5 and size 8
   ii) Order 6 and size 12 are Planar.

b) Prove that a graph of Order n consisting of a single cycle is 2-chromatic if n is Even and 3-chromatic if n is Odd. 8 M