Code No: NR-11-MCA

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
MCA-I Semester Regular Examinations, February 2010
DISCRETE MATHEMATICS & GRAPH THEORY

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

Answer any Five questions
All questions carry equal marks

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1.a) Find the converse of the following statement "If I have time and I am not too tired, then I will go to stores"

b) Show that the proposition $(PV \sim Q) \Lambda (\sim PV \sim Q) VQ$ is a tautology

2.a) Given A={2,3,4}, B={4,5}, C={1,2,4,8}. Prove the associative and distributive properties on sets.

b) Let the relation R={(a,b), (a,c), (b,a),(b,c), (c,d),(d,a)} on the set {a,b,c,d}. What is the transitive closure of R.

3.a) How many ways 5 identical apples and 5 identical oranges be distributed among 5 people such that each person receive exactly 2 fruits

b) Consider the word MISI SSI PPI. How many arrangements are there
i) Altogether and ii) where no two as appear together

4.a) Find the coefficient of x^{12} in the power series of the function $x^3/(1+4x)^2$

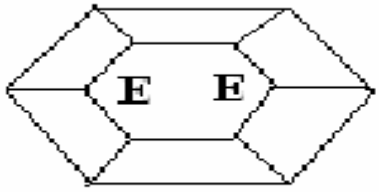
b) Find all the solutions for the recurrence relation $a_n = -5a_{n-1} - 6a_{n-2} + 42.4^n$

5.a) Explain the steps involved in Warshal's algorithm. Give an example graph, and the corresponding input and output matrices

b) Define self dual graph. List the rules to obtain a self dual graph

6.a) State and prove the Euler's formula for planar graphs.

b) Prove that there is an Hamiltonian cycle in the following graph



7.a) What are the steps involved is the algorithm for pre order and post order traversals of a binary tree

b) Explain how the tree traversal is performed for a general tree traversal.

8.a) Give a brief note about cut sets and Tie sets. Give suitable examples

b) Distinguish between working of Prim's and Kruskal's algorithm