Code: 06MC101

MCA - I Semester Supplementary Examinations, August/September 2012

DISCRETE STRUCTURES

(For students admitted in 2006, 2007 & 2008 only)

Time: 3 hours Max Marks: 60

Answer any FIVE questions

All questions carry equal marks

*****

1 (a) What is meant by Tautology? Show that ¬(p∧q) ∨q is a tautology by using truth table and equivalence formulas.

(b) Define law of duality. Explain this with a suitable example.

2 (a) Give an argument which establish the validity of the following sequence, all integers are rational numbers, some integers are powers of 2 therefore, some rational numbers are powers of 2.

(b) What is free and bound variable? Explain with suitable examples.

3 Define lattice. Give example graph for a lattice. Explain the properties of lattice.

4 (a) Show that the set {1, 2, 3, 4, 5} is not a group under addition and multiplication module 6.

(b) Define Semigroup and Monoid.

5 (a) Explain about multinomial coefficients.

(b) Explain inclusion-exclusion principle. Give example.

6 What is recurrence relation? Explain the relation of Towers of Hanoi with a neat diagram.

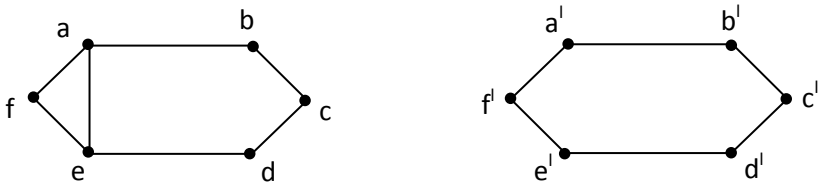
7 How many different spanning trees does each of the following simple graphs have?

(a) K_3

(b) K_4

(c) $K_{2,2}$ (For K_n, n^{n-2} and for $K_{n,n}$ use n^{2n-2})

8 Determine whether the following graphs are isomorphic.



*****