Discrete Structures (CSE-203-F)

Q1 Define

- Tautologies
- Power set
- Order of Recurrence
- Linear Recurrence Relation
- Cartesian Product
- Disjunction
- Partial order Relation.

Q2 Explain Properties of Relation with example.?

Q3 a) Let f : A→B be a function. Then show that f^{-1} exists iff f is a bijective function

b) Consider the following conditional statement :

p : if the flood destroy my house or the fire destroy my house, then my insurance company will pay me.

c) Let A = {1,2,3,4} and R={(2,1),(3,1),(3,2),(4,1),(4,2),(4,3),(1,1),(2,2)}

Show that R is Equivalence Relation or not.

Q4 Explain Algebra of sets with example.?

Q5 From the following formulae find out tautology , contingency and contradiction.

a) (A→B) (A (A B))
b) Prove that
(p ↔q) = (p q) (p q)

Q6 Explain Types of function with example.?

Q7 a) Find the solution of the recurrence relation $a_r = a_r$-$11a_{r-2} + 6a_{r-3}$ with initial conditions $a_0 = 2$, $a_1 = 5$, $a_2 = 15$

b) Solve the difference equation $a_{r+4} + 2a_{r+3} + 3a_{r+2} + 2a_{r+1} + a_r = 0$

Q8 A) Draw Complete Bipartite Graph k2,k3 and k2,k5

B) Show that V-E+R=2 for the connected graph.

Q9 Define with example

- Isomorphic
- Cut Points
- Homeomorphic

- Monoid
- Euler's Path

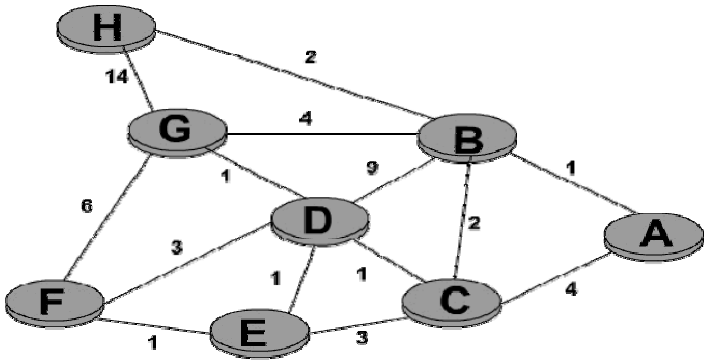
- Cosets
- Field

Q10 a) State and Prove Euler's Theorm.

b) Solve the difference equation

$$y_{k+4}+4y_{k+3}+8y_{k+2}+8y_{k+1}+4y_k=0$$

Q11 Find the shortest path between H to C :-



Q12 Solve the recurrence relation

$a_{r+2}-3a_{r+1}+2a_r=0$

by the method of generating function with the initial condition $a_0=2$& $a_1=3$

Q.13 Solve the difference equation by the method of total solution 10

$$A_r - 4a_{r-1} + 4a_{r-2} = 3r$$

Q14 a) Consider an algebraic System (Q,*) where Q is the set of rationalnumbers and * is the binary operation defined by

$a * b = a+b-ab$ where a, b belongs to Q

Determine whether (Q,+) is a group. 5

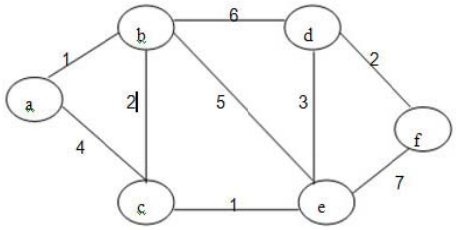
b) Show whether the relation (x,y) belongs to R , if x>=y defined on the set of =ve integers is a partial order relation

Q15 a) Find the no. of distinguish words that can be formed from the letter of MISSISSIPPI

5

b) Show that a function f : A→B is invertible iff 'f ' is one-one & onto. 5

Q16 Find the Shortest path from A to F



Q17 Find the Preorder , In order and post order of the given tree-