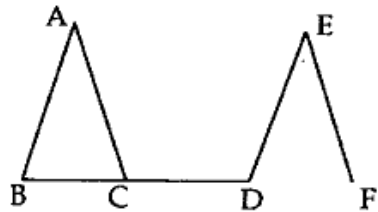(b) Distinguish between eurelian path and circuit with suitable example. 10

9. (a) Draw all spanning trees of graph given below : 10

(b) Distinguish between Hamilton path and circuit by taking suitable example. 10

24041

B. Tech. 3rd Semester (CS & IT)

Examination – December, 2018

DISCRETE STRUCTURE

Paper : CSE-203-F

Time : Three Hours]   *[Maximum Marks : 100*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in total selecting *one* question from each of *four* Sections. Question No. 1 is *compulsory*.

1. Explain the following terms by taking suitable example :   20

   (i) Equivalence relations and partitioning

   (ii) Polynomials and their evaluation

   (iii) Integral Domain and fields

   (iv) Multi graph and Weighted graph

SECTION – A

2. Define propositions, tautologies, contradictions and hence prove that the following propositions are tautology : 20

   (i) $p \vee \sim p$

   (ii) $\sim(p \wedge q) \vee q$

   (iii) $P \Rightarrow (p \vee q)$

3. (a) Let $f : A \to B$ be a function. Then show that f-1 exists iff f is a bijective function. 20

   (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.

SECTION – B

4. (a) Explain permutations and combination and hence find in how many ways a committee of 3 faculty members and four students be selected from 6 faculty members and 6 students. 12

   (b) Define AP, GP and AG series with examples. Also write the formula for sum of n terms in AP, GP, AG series. 8
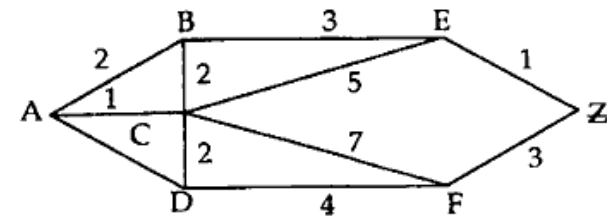
5. (a) Solve the recurrence relation : 10

   $a_r - 7a_{r-1} + 10a_{r-2} + 20 = 0$ by the method of generating functions with the initial conditions $a_0 = 3$ and $a_1 = 3$.

   (b) Solve the recurrence relations : 10

   $a_r - 4a_{r-1} + 4a_{r-2} = 0$ and find the particular solution, given that $a_0 = 3$ and $a_1 = 3$.

SECTION – C

6. Define the following with suitable example : 20

   (i) Semi group

   (ii) Homomorphism

   (iii) Cosets

   (iv) Integral domain and fields

7. (a) State and prove Lagrange's Theorem. 10

   (b) Define with suitable example : 10

   (i) Isomorphism and automorphism

   (ii) Normal subgroup

SECTION – D

8. (a) Find the shortest path from A to Z. 10