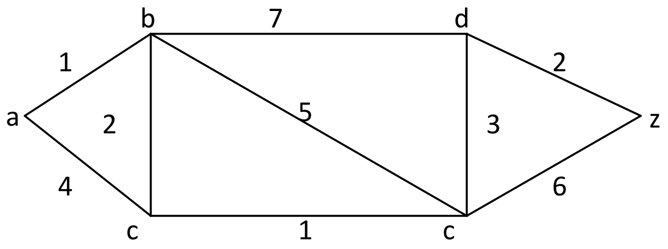
Q.4 (a) Find the shortest path between a and z for the following graph



(b) Let G be a connected planer graph with P vertices and q edges. Where P$\geq$3. Then prove that

$$q \geq 3P - 6$$

Q.5 (a) What is the solution of the recurrence relation

$$a_n = a_{n-1} + 2a_{n-2}$$

with $a_0=2$ and $a_1=7$?

(b) Explain Discrete numeric function.

Q.6 a) Write the generating function for the sequence $\{a_r\}_{r=0}$ defined by

$$a_r = \frac{(-1)^r (r+2)(r+1)}{2}$$

(b) Explain injective and subjective mapping

Q.7 a) Determine the particular solution and general solution the given initial condition

$$x_n - 2x_{n-1} = 6n; x_1 = 2$$

(b) Differentiate between a function and relation.

Q.8 Write short notes

(a) Defined Euler graph and Eulerian path

(b) Write Properties of lattices.

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[Total No. of Questions: 8] *[Total No. of Printed Pages : 2]*

Roll No…………………..

MCA-14
MCA-I SEMESTER

Examination, Jan.- 2019

Discrete Mathematics Structure

Time: Three Hours

Maximum Marks: 70

Note: i) Attempt any five questions (each question carries equal marks)

Q.1 To Prove that

(a) $A-(B \cup C) = (A-B) \cap (A-C)$.

(b) Show by mathematical induction method that

$$1^2+3^2+\ldots\ldots\ldots\ldots+(2n-1)^2 = \frac{n(n+1)(2n-1)}{3}$$

Q.2 (a) In a Boolean algebra Prove the following

a.b + b.c+c.a= (a+b). (b+c). (c+a)

(b) Prove that if L be a founded distribution lattice and an element in L Possesses a complement then this is unique.

Q.3 Prove that the following statement is a tautology

$(P \Rightarrow q) \vee r \Leftrightarrow [(P \vee r) \Rightarrow (q \vee r)]$