AJEENKYA
D Y PATIL UNIVERSITY

End Term Examination (December 2019)

School: School of Engineering **Program: MCA**

Course: Mathematical foundation for IT **Course Code: CSC 502**

Semester: I **Max Marks: 50** **Duration (mins) :** 90 Min

Section A

Q1 Attempt the following: (Any Five) **10 Marks**

a) Perform concatenation of pair of languages : L1 = { a , aa , aaa } L2 = { b , bb , bbb }
b) Write the definition & example of Complete Bipartite Graph
c) Explain the types of data with example.
d) Write the formula for Standerd Deviation
e) Define the term ANOVA
f) What is mean by Relation ? Explain the condition.

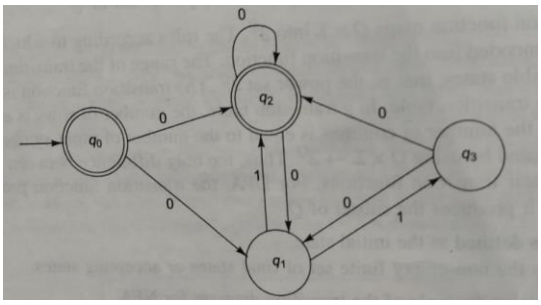
Section B

Q2. Answer the following (Any Four) **20 Marks**

a) Represent the relation in Matrix form :

R = { (1,a) (1,b) (2,c) (3, d) (4, a) (5, c) (6, d) (7, d) (3,a) (4, b) (2,d) (6,a)}

b) Convert the given NFA in to DFA with transition table & draw the machine :



c) Show that the statement (p V q)^[(~p) ^ ((~q)] is a contradiction

d) Explain any five types of graphs with example.

e) Find the values of Linear Regression and correlation of following data :

X :	-1	1	2	4	6	7
Y:	-1	2	3	3	5	8

Section C

Q3. Answer the following (Any Two) **20 Marks**

a) The following data given the measurements of the axles of bicycle wheels.12 samples were taken so that each sample contains the measurements of 4 axles. The measurements which were more than 5 inches are given here. Obtain trail control limits for $\bar{X}$ and R charts and comment where the process is under control or not.

139	140	142	136	145	146	148	145	140	140	141	138
140	142	136	137	146	148	145	146	139	140	137	140
145	142	143	142	146	149	146	147	141	139	142	144
144	139	141	142	146	144	146	144	138	139	139	138

[For n = 4 , $A2$=0.73 ,$D3$=0 ,$D4$=2.28]

b) The theory predicts the proportion of beans, in the four group A, B, C, and D should be 9 : 3 : 3 : 1. In an experimental among 1,600 beans, the number in the four groups were 882, 313, 287, 118.Does the experimental result support the theory?
(The total value of א2 for 3 d.f at 5% level of significance is 7.81)

c) Find the mean, median & mode for following table:

Weight	93-97	98-102	103-107	108-112	113-117	118-122	123-127	128-132
No.of students	3	5	12	17	14	6	3	1

*******ALL THE BEST******