Total No. of Questions : 4]

SEAT No. : [ ]

PC26

[6360]-26

[Total No. of Pages :2

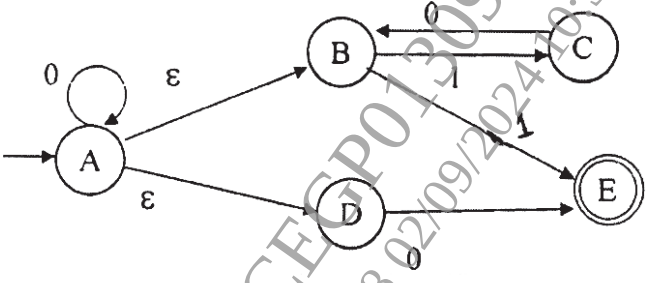
T.E. (Computer Engineering) (Insem)
THEORY OF COMPUTATIONS
(2019 Pattern) (Semester- I) (310242)

Time : 1 Hour] ***[Max. Marks : 30***

Instructions to the candidates:

1) ***Answer the question of 1 or 2, 3 or 4.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data if necessary.***

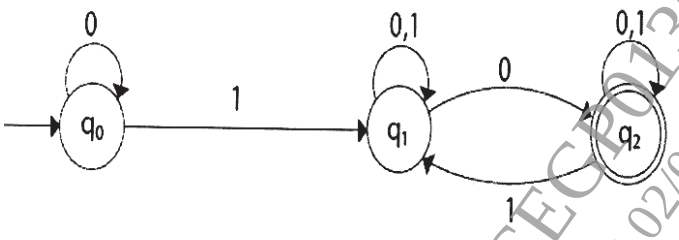
Q1) a) Convert the given NFA-ε to an NFA to DFA. **[9]**



b) Design a DFA which can accept a decimal number divisible by 3. **[6]**

OR

Q2) a) Convert following NFA to DFA. **[7]**



b) i) Design a moore machine for the 1's complement of binary number.

ii) Design a Mealy machine to find out 2's complement of a given binary number. **[8]**

P.T.O.

Q3) a) Convert the following RE to ε-NFA and find the ε-closure of all the states and corresponding DFA. (0 + 1) *.1.(0 + 1). **[9]**

b) i) Regular Expression of strings over {0,1} that have at least one 1.

ii) Regular Expression of strings over {0,1} that have at most one 1.

iii) Regular Expression of all strings over {0,1} ending with 00 and beginning with 1.

[6]

OR

Q4) a) i) Write the regular expression for the language starting with a but not having consecutive b's.

ii) Write the regular expression for the language L over ∑ = {0,1} such that all the string do not contain the substring 01.

iii) Write the regular expression for the language containing the string over {0,1} in which there are atleast two occurrences of 1's between any two occurrences of 1's between any two occurrences of 0's. **[7]**

b) Design a FA from given regular expression 10 + (0 +11) 0 *1. **[4]**

c) Construct the regular expression for the given DFA using Ardens Theorem. **[4]**