Total No. of Questions : 4]

SEAT No. : ____

PE53

[Total No. of Pages : 2

[6579]-485

T.E. (Information Technology) (Insem)

THEORY OF COMPUTATION

(2019 Pattern) (Semester - I) (314441)

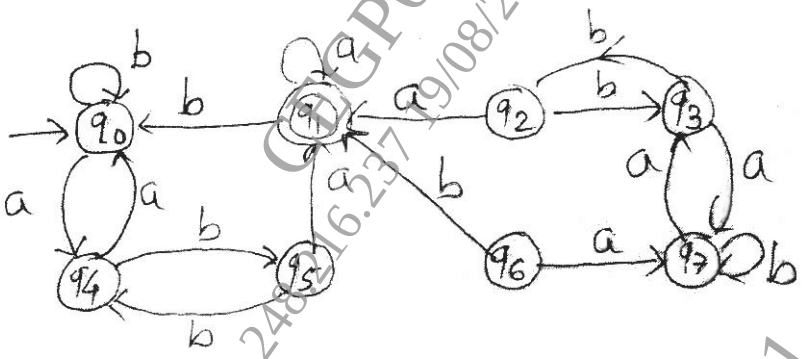
Time : 1 Hour] ***[Max. Marks : 30***

Instructions to the candidates:

1) ***Attempt Q1 or Q2, Q3 or Q4.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) Construct a DFA (Deterministic Finite Automata) which accepts on octal number divisible by 3. **[5]**

b) Construct the minimum state automata equivalent to the following DFA (Deterministic Finite Automata) **[5]**



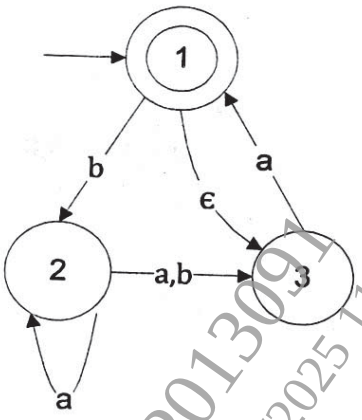
c) Design a Mealy Machine accepting the language of strings From $\sum^*$ where $\sum = \{0,1\}$ and ending with 00 or 11. **[5]**

OR

Q2) a) Construct a DFA (Deterministic Finite Automata) over the language $\sum = \{0,1,2\}$ to accept all the strings having substring '120'. **[5]**

b) Construct DFA (Deterministic Finite Automata) for the following NFA (Non-Deterministic Finite Automata). **[5]**

P.T.O.



c) Compare Moore Machine and Mealy Machine. **[5]**

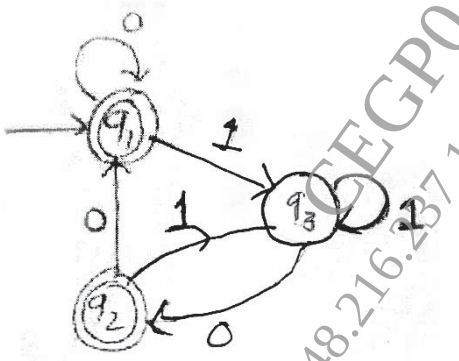
Q3) a) For the following regular expressions, draw the FA (Finite Automata) recognizing the corresponding language. **[5]**

i) (0+1)*(1+00) (0+1)* (1+01)

ii) 0(1+10)+10*+01*0

b) State and explain Pumping Lemma for a regular language. **[5]**

c) Find the regular expression for the FA (Finite Automata) using Arden's Theorem. **[5]**



OR

Q4) a) Use pumping lemma to check whether the language, $L = \{ww \mid w \in \{0,1\}^*\}$ is regular or not. **[5]**

b) Find the regular expression for the language over inputs {0,1} **[5]**

i) All string containing 011 at the end.

ii) String contains atleast two zeros.

c) Prove that "Regular language is closed under union and concatenation". **[5]**