Total No. of Questions : 6]

SEAT No. :

P5778

[Total No. of Pages : 2

TE/Insem./Oct.-35
T.E. (Computer)
THEORY OF COMPUTATION
(2012 Pattern) (Semester - I)

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

Instructions to the candidates:

1) ***Answer three questions.***
2) ***Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data wherever required.***

Unit-I

Q1) a) Determine a regular expression over the alphabets {x, y} for the following, **[4]**

i) All String containing exactly two x's

ii) All String that start with xy

b) Construct a DFA over an alphabet {0, 1} for accepting the strings having number of l's as multiple of 3 **[6]**

OR

Q2) a) What is Kleen Closure? What is Positive closure? For a given language L under what Circumstances will L^+ and L* equal? **]6[**

b) Using pumping lemma for regular Sets provide that the language, $L = \{0^m1^n0^{m+n} | m >= 1 \text{ and } n >= 1\}$ is not regular. **[4]**

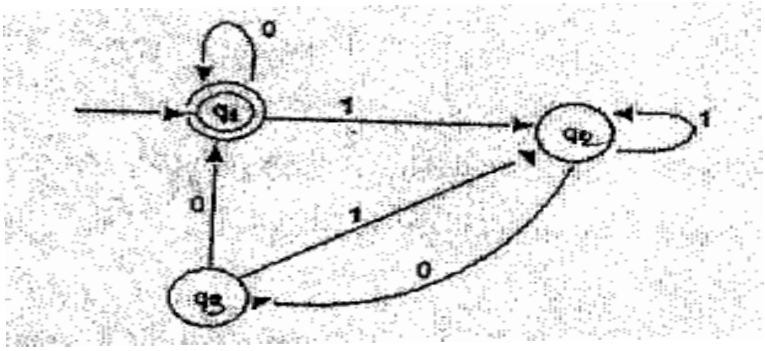
Unit-II

Q3) a) Differentiate between DFA and NFA with suitable example. **[2]**

b) Find the Regular Expression for the set of strings recognized by the given FA. **[4]**

P.T.O.

Use Arden's Theorem.



c) Construct the DFA for the language of all string that begin and end with same symbol Over the alphabet Σ = {a, b}. **[4]**

OR

Q4) a) Design a Moore machine for computing the 2's complement of a binary number. Convert it into its equivalent Mealy machine. **[6]**

b) Explain the Closure and Decision properties of finite Automata. **[2]**

c) Explain limitations of Finite Automata. **[2]**

Unit - III

Q5) a) Write a context free grammar for the following language 0(0+1)* 01 (0+1)*1. **[4]**

b) For the Left linear grammar below, obtain the equivalent Right linear grammar. **[6]**

S->C0|A0|B1

A->A1|C0|B1|0

B->B1|1

C->A0

OR

Q6) a) Explain with suitable examples, any two applications of Context Free Grammars. **[4]**

b) Convert the following CFG into Chomsky Normal form (CNF) **[6]**

S->ASA|aB

A->B|S

B->b|ε