PVP 12

Code: CS4T1

II B.Tech - II Semester – Regular Examinations - JUNE 2014

THEORY OF COMPUTATION
(COMPUTER SCIENCE & ENGINEERING)

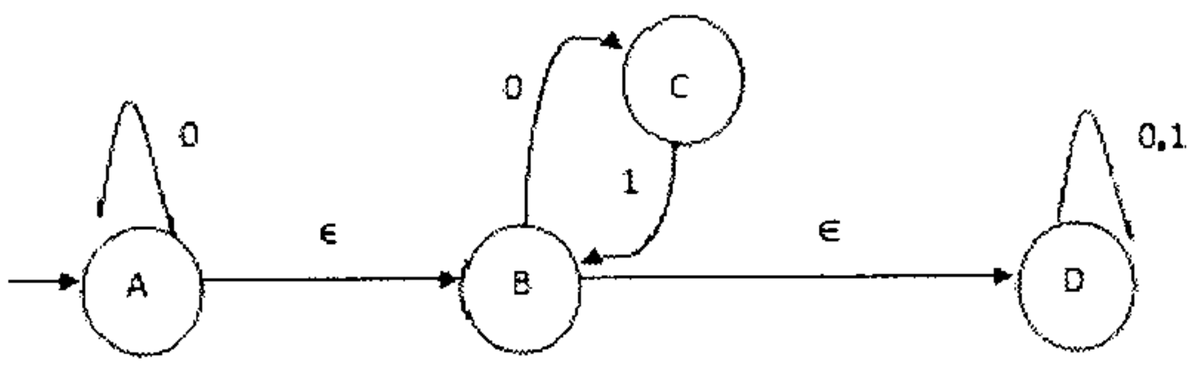
Duration: 3 hours Marks: 5x14=70

Answer any FIVE questions. All questions carry equal marks

1. a) Define NFA and DFA, write significant differences between them. 7 M

b) Construct NFA that accepts all the strings over alphabet {0, 1} where each string has 0 as the 5^{th} symbol from right hand side. 7 M

2. a) Construct ϵ-free NFA for the following ϵ-NFA 7 M



b) Convert the following Mealy M/c represented by the table into equivalent Moore M/c. 7 M

Transition→	0		1	
Present State	**Next State**	**O/P**	**Next State**	**O/P**
→q0	q2	0	q1	1
q1	q0	0	q2	0
q2	q0	1	q3	1

3. a) Convert the following regular expression into finite automata

(a+b)* (ab+ba) (b+a)* 6 M

b) Discuss closure properties of regular sets. 8 M

4. a) Explain different types of grammars. 7 M

b) Construct Left-Linear and Right-Linear grammars for the regular expression. 7 M

a* ba (b+a)*

5. a) What is left recursion? Give an example for left recursive grammar. 6 M

b) Using pumping lemma for context free languages prove that $L = \{a^n b^n c^n \mid n \geq 0\}$ is not context free language. 8 M

6. a) Define PDA. Write formal definitions for Acceptance by empty state, Acceptance by final state. 7 M

b) Design a PDA that accepts language generated by the following CFG

$S \rightarrow aSa \mid bSb \mid a \mid b$ 7 M

7. a) What are recursive and recursively enumerable languages? Write the difference between them. 6 M

b) Construct a Turing Machine for the language
$L = \{0^n 1^n 2^m \mid n, m>=1\}$. 8 M

8. a) What is Halting problem of a Turing Machine? Is it Decidable? 7 M

b) Define NP- complete and NP-hard problems. 7 M