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CSE204

Enroll. No.

[ETD]

END SEMESTER EXAMINATION :
APRIL – MAY, 2015

THEORY OF COMPUTATION

Time : 3 Hrs.

Maximum Marks : 70

Note: *Attempt questions from all sections as directed.*

SECTION – A (30 Marks)

Attempt any five questions out of six.

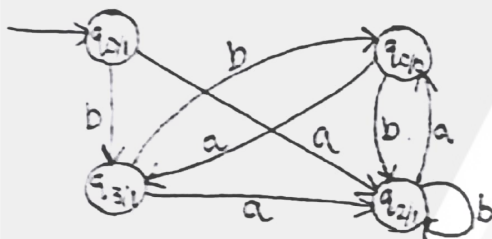
Each question carries 06 marks.

1. Give the Chomsky Hierarchy of Grammars specifically giving form of production rules in each class of grammar.
2. Write a Regular expression for the language containing all strings of 0 and 1 that begin with 1 and not containing 001 as a substring. Convert this regular expression into equivalent DFA.
3. What is Moore Machine ? Convert the given Moore machine into Mealy machine.

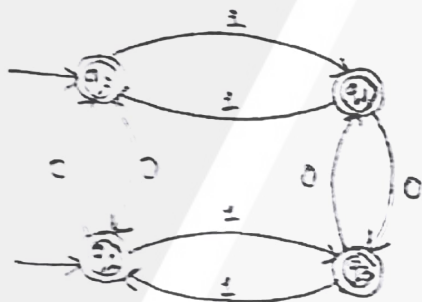
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4. Consider the following transition diagram and Test whether the string 110101 is accepted by the finite automata represented by given transition diagram. Show the entire sequence of states traversed.



5. Explain the difference between Deterministic and Non-Deterministic Push down Automata giving their definition. Illustrate with an example of each.
6. What is Greibach Normal Form (GNF). Convert the following language into GNF $L = \{a^m b^n c^d \mid m, n \geq 1\}$.

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SECTION - B (20 Marks)

Attempt any two questions out of three.
Each question carries 10 marks.

- Prove that $f_1(x, y) = x + y$ is Primitive recursive function.
- Discuss the Halting Problem of Turing Machine and undecidable problems for recursive Enumerable Languages.
- Construct Push Down Automata for the language

$$L = \{a^n b^n c^n \mid n \geq 0\}$$

SECTION - C (20 Marks) (Compulsory)

- (a) Define Turing Machine (TM). Design a TM for the language $L = \{a^n b^n c^n \mid n \geq 1\}$.
(b) Does the PCP with two lists $X = \{a, bab^2, ba\}$ and $Y = \{b^2, ba, b\}$ have a solution? If so then write all the possible solutions.