(Please write your Exam Roll No.) *Exam Roll No. ……*

END TERM EXAMINATION

THIRD SEMESTER [MCA] DECEMBER 2013

Paper Code: MCA 201	**Subject : Theory of Computation (2010 Onwards)**

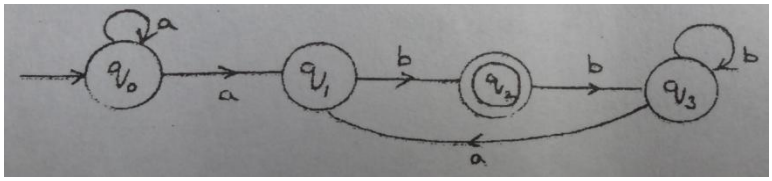
Time : 3 Hours **Maximum Marks : 60**

Note: Attempt any five questions in all. All questions carry equal marks.

Q1.

a. With the help of schematic diagram, explain the function of DFA. What are the reasons to say it is Deterministic?

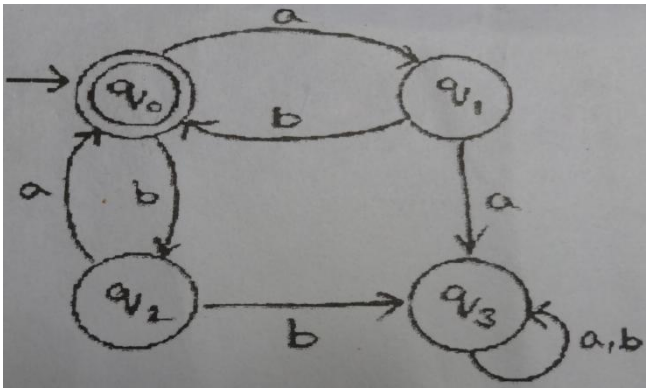
b. For the NFA given by the following state transition diagram



a) Check whether the string abbabba is accepted or not.
b) Give atleast two transition paths.
c) Find equivalent DFA.

Q2.

a. Construct the regular expression accepted by following finite automaton



b. Construct a DFA for the regular expression 01+(00+11)*

Q3.

a. Define Pushdown automata. Differentiate PDA by empty stack and final state by giving their definitions.
b. Obtain PDA to accept all strings generated by the language $\{a^n b^m a^n / m,n>=1\}$.

Q4.

a. Construct a Turing Machine to perform multiplication.
b. Prove the equivalence of two-way infinite tape with standard Turing Machine.

Q5.

a. Discuss in detail about Universal Turing Machine.
b. Prove that halting problem is undecidable.

Q6. Explain Chomsky classification in detail. Explain each classification type with an example.

Q7.

a. Differentiate NP complete and NP hard problems. Explain NP complete and NP hard problems with some examples.
b. Define LR(1) parsing method with an example.

Q8. Write short note on any two.

a. Pumping Lemma
b. Kleene's theorem
c. Myhill Nerode Theorem

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