Reg. No. : ....

Name : ....

Third Semester M.C.A. Degree Examination, May 2009
06.305.3 : THEORY OF COMPUTATION
(Elective – I)

Time : 3 Hours   Max. Marks : 100

PART – A

Answer **all** questions :

1. What is Chomsky's hierarchy ?

2. State the pumping lemma for regular sets.

3. Show that $L = \{a^m\ b^n\ c^m\ d^n / m > 0,\ n > 0\}$ is not a CFL.

4. Design a Moore machine which computes mod 4 for a binary input string treated as binary integer.

5. Explain the working of a two way finite automa.

6. What do you understand by ambiguous grammar ?

7. Define Greibach normal form.

8. Show that if a language L and its complement are both recursively enumerable then L is Recursive.

9. What is PDA ?

10. State Myhill-Nerode theorem.   **(10×4=40 Marks)**

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PART – B

Answer **any two** questions from **each** Module.

Module – 1

11. Write a brief note on application of pumping lemma.

12. Describe the method to convert NFA to DFA with examples.

13. Distinguish between Mealy and Moore machines.

Module – 2

14. Find a deterministic finite state automation that accept the set consisting of all strings with exactly one "a" on $\sum \{a, b\}^*$

15. Write a brief note on normal forms of CFG with examples.

16. Write a note on Chomsky classification of languages.

Module – 3

17. Design a Turing machine to compute $\log_2 n$.

18. What are TMs ? Prove the equivalence of single tape and multi-tape TMs.

19. Show that the "universal language" is recursive.   **(6×10=60 Marks)**

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