D 20946 (Pages : 2) Name.....

Reg. No.....

FIFTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, OCTOBER 2011

CS/IT/PTCS 09 506—THEORY OF COMPUTATION

(2009 Admissions)

Time : Three Hours Maximum : 70 Marks

Part A

Answer **all** *the questions.*

1. Give the examples/applications designed as finite state system.
2. What is
   (a) CFL.
   (b) Sentential form.
3. What is the language accepted by TM ?
4. Give examples of recursive languages.
5. Define MPCP or Modified PCP.

(5 × 2 = 10 marks)

Part B

Answer any **four** *questions.*

6. Convert the following to Greibach Normal form.

   S $a'' + a'$ AB

   A $\hat{a} + 'a$ BC

   B $\hat{a} + 'b$

   C $\hat{a} + 'b$.

7. Show that the class of languages accepted by pushdown automata is exactly the class of content free languages.
8. Construct a turning Machine that accepts the Languages $a*ba*b$.
9. Describe the method of Godelization.
10. Show that any finite set is turning–decidable.
11. Show that travelling salesman problem is NP–complete.

(4 × 5 = 20 marks)

Turn over

Part C

12. Prove that equivalence of NFA and DFA.

Or

13. Explain in detail with an example the conversion of NDFA to DFA.

14. Explain Chomsky classification.

Or

15. Explain in detail the ambiguity in content free grammar.

16. Prove the equivalence of two–way infinite tape with standard turning machine.

Or

17. Discuss in detail about universal Turning machine.

18. Prove that the halting problem is undecidable.

Or

19. Prove that there exists an recursively enumerable language whose complement is not recursively enumerable.

(4 × 10 = 40 marks)