

D 30997

Name

Reg.



FIFTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION
OCTOBER 2012

IT/CS 09 506—THEORY OF COMPUTATION

Time : Three Hours

Maximum : 70 Marks

Part A

Answer all the questions.

1. Define (a) Finite Automata on (FA) ; (b) transition diagram.
2. Define context free grammar.
3. What is (a) total recursive function ; (b) partial recursive function.
4. What are the techniques for turning machine construction ?
5. What is the difference between PCP and MPCP ?

(5 × 2 = 10 marks)

Part B

Answer any four questions.

6. Differentiate Deterministic and Non-deterministic Automata.
7. What is primitive recursive function ?
8. Explain two normal forms of content free grammar.
9. State pumping lemma for context free languages.
10. Cite example for NP hard problem.
11. What is a multihead turning machine ?

(4 × 5 = 20 marks)

Part C

Answer all the questions.

12. Construct a minimized automata for the following automata to define the same language.

Or

13. Show that $L = \{a^n \mid n \geq 0\}$ is not regular.
14. Prove that if there exists a PDA that accepts by final state then there exists an equivalent PDA that accepts by Null state.

Or

15. Convert grammar $S \rightarrow ABb \mid a, A \rightarrow aaA \mid B, B \rightarrow bAb$ into greibach normal form.
16. Discuss in detail about universal turning machine.

Or

17. Construct a turning machine to perform multiplication.
18. Prove that Travelling Salesman's Problem (TSP) is NP-complete.

Or

19. Explain directed Hamiltonian circuit problem with example.

(4 × 10 = 40 marks)