(2066)

16054(J) —T-16

B. Tech 4th Semester Examination

Theory of Computation (NS)

CS-222

Time : 3 Hours   **Max. Marks : 100**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Candidates are required to attempt five questions in all selecting one from each of the sections A, B, C & D. And all subparts of the questions in section E.

SECTION - A

1. Construct a DFA for the following:

   (a) All strings that contain exactly 4 zeroes.

   (b) All string that don't contain the substring 110. (20)

2. Explain the Difference and Equivalence between NFA and DFA (20)

SECTION - B

3. State and Prove pumping lemma for Context free languages. (20)

4. Write note on (a) Myhill-Nerode theorem (b) Minimization Algorithm. (20)

SECTION - C

5. Write a note on (a) Regular set (b) Context sensitive grammar (c) Pumping lemma (d) Parsing (4×5=20)

[P.T.O.]

---

6. (a) State the two normal forms and give an example.

   (b) State the Pumping lemma for CFG.

   (c) Write the formal definition of PDA.

   (d) Define ambiguity regular grammar. (4×5=20)

SECTION - D

7. (a) Explain how the multiple tracks in a Turing Machine can be used for testing given positive integer is a prime or not? (10)

   (b) Explain in detail:" The Turing Machine as a Computer of integer functions". (10)

8. (a) State the techniques for Turing machine construction? Illustrate with a simple language (10)

   (b) Explain Chomsky Hierarchies of Grammar. (10)

SECTION - E

9. (a) List any two ways of theorem proving.

   (b) Define transition diagram.

   (c) Differentiate between recursive and recursively enumerable language.

   (d) What is the need for finite automata?

   (e) Design a Turning machine to compute n mod 2.

   (f) Define DFA.

   (g) Application of Pushdown Machines

   (h) Primitive recursive function. (2½×8=20)