

Con. 3132-07.

(REVISED COURSE)

ND-1216

(3 Hours)

[Total Marks : 100]

- N.B. :** (1) Question No. 1 is **compulsory**.
 (2) Answer any **four** out of the remaining **six** questions.

1. (a) Distinguish between NFA and DFA. Give two examples of each. 5
 (b) Design a FSM for testing divisibility by three. 5
 (c) Design a Moore M/c to change all vowels to '\$'. 5
 (d) Design a PDA to accept $(ab)^n (cd)^n$. 5
2. (a) What is parsing ? What are the two different parsing methods ? Explain their difference with examples. 10
 (b) Design a TM to generate 2^n . 10
3. (a) Design a suitable PDA to accept an even palindrome over $\{a, b\}$. 10
 (b) Design a NFA to accept $(a/b)^* aba$. Convert it to a reduced DFA. 10
4. (a) Design a TM to accept $(1^n 1 b^n)$. Can a DFA be designed for the same ? Justify. 10
 (b) Convert the following to CNF : 10
 $S \rightarrow a S b / b S a / ab / ba / \epsilon$.
5. (a) Design a TM to multiply 2 unary numbers. 12
 (b) Use pumping lemma to show that the following is regular. 8

$$L = \{x / x = 0^n 1^{2m} \quad n > 0\}$$

$$m > 0$$
6. (a) Define different types of grammars and give one example of each. 10
 (b) State different types of machines and state atleast one application of each. 10
7. Write short notes on any **five** out of the following : 20
 - (a) GNF
 - (b) Universal TM
 - (c) Recursive descent parser
 - (d) Post correspondence problem
 - (e) Myhill-Nerode theorem
 - (f) Ambiguity resolution.