

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

M.Sc.(IT)/MCA (Sem.-4)
THEORY OF COMPUTATION
Subject Code : PGCA-1927
Paper ID : 79692
Date of Examination : 09-07-22

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

1. Write short notes on :

- a) Moore Machine
- b) NDFA
- c) Arden's Theorem
- d) Left context
- e) UNIT Production
- f) Acceptability of a string
- g) Ambiguous Grammar
- h) TM
- i) GNF
- j) Type2 grammar.

SECTION-B

2. Differentiate between DFA and NFA. Discuss to convert NFA to DFA.
3. Find a reduced grammar equivalent to the given grammar.

$S \rightarrow AC \mid B, A \rightarrow a, C \rightarrow c \mid BC, E \rightarrow aA \mid e.$

4. Construct a Moore machine equivalent to the Mealy machine M defined by following :

Present State	Next State			
	a = 0		a = 1	
	State	Output	State	Output
$\rightarrow q_1$	q_1	1	q_2	0
q_2	q_4	1	q_4	1
q_3	q_2	1	q_3	1
q_4	q_3	0	q_1	1

5. Find a grammar in GNF equivalent to the grammar

$E \rightarrow E + T \mid T \quad T \rightarrow T * F \mid F \quad F \rightarrow (E) \mid a$

SECTION-C

6. Describe any two representation of TM.
7. Design PDA for $\{wcw^T \mid w = \{a, b\}^*\}$.
8. Describe the universality of Turing Machines and Cook-Levin Theorem.
9. Design Turing Machine of $\{0^n 1^n \mid n \geq 1\}$.

NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.