

Roll No.

Total No. of Pages : 02

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B.Tech. (Information Technology) (Sem-5)
FORMAL LANGUAGE & AUTOMATA THEORY

Subject Code : BTIT-501-18

M.Code : 78256

Date of Examination : 01-06-2023

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

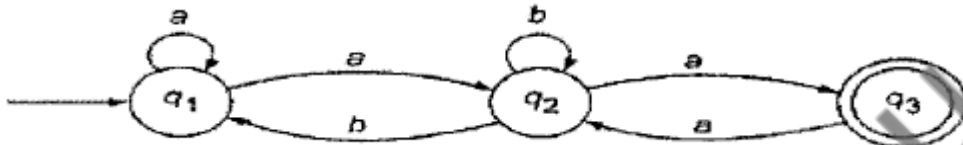
SECTION-A

1. Write briefly :

- a) Type 1 grammar
- b) Moore machine
- c) Language
- d) Chain rule
- e) Instantaneous Description of TM
- f) GNF productions
- g) Halting problem of TM
- h) Define Kuroda Normal Form
- i) NP-complete
- j) Context sensitive grammars.

SECTION-B

2. Explain with example procedure to convert a Moore machine to a Mealy machine.
3. Prove that string represented by following transition system is $(a+ a(b+aa)^*b)^* a(b+aa)^*a$.



4. Define Ambiguous? Explain with example when the grammar is ambiguous.
5. Find a reduced grammar equivalent to the given grammar
 $S \rightarrow AC \mid B, \quad A \rightarrow a, \quad C \rightarrow c \mid BC, \quad E \rightarrow aA \mid e$
6. Describe the Cook-Levin Theorem

SECTION-C

7. Find a grammar in GNF equivalent to the grammar
 $E \rightarrow E + T \mid T \quad T \rightarrow T * F \mid F \quad F \rightarrow (E) \mid a$
8. Discuss the Universality of Cellular Automata.
9. Design PDA for $\{a^n b^m \mid n > m > 1\}$.

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