Roll No. | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

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 l 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

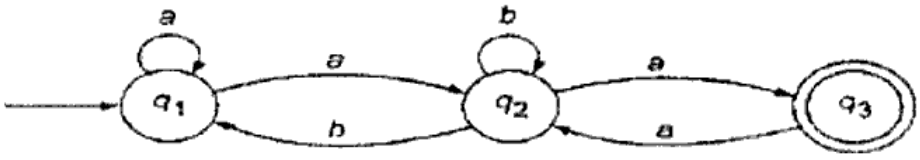
   i) NP-complete

   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 ambigious.

5. Find a reduced grammar equivalent to the given grammar

S —▶ AC | B, A—▶ a, C —▶ c | BC, E —▶ aA| e

6. Describe the Cook-Levin Theorem

SECTION-C

7. Find a grammar in GNF equivalent to the grammar

E—▶ E + T | T T —▶ T * F | F F—▶ (E) | 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.