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

Total No. of Questions : 09

B.Tech. (CSE) (Sem–5)
FORMAL LANGUAGE & AUTOMATA THEORY
Subject Code : BTCS 502-18
M.Code : 78321
Date of Examination : 08-06-2023

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. Define Formal Language.

   b. Write some applications of Automata theory.

   c. Write regular expression for strings begins with 00 and ends with 11.

   d. Why do we need lambda move in automata?

   e. Every Type grammar is a Type 3 grammar (T/F). Justify your answer.

   f. What is left recursion?

   g. What is ambiguity in CFG?

   h. Define LBA.

   i. What is NP complete problem?

   j. What is Church Turing thesis states?

SECTION-B

2. Explain the Chomsky hierarchy of grammars. Show the correspondence between the automation and types of Grammar.

3. Discuss the procedure to convert NDFA to DFA with the help of suitable example.

4. What is parsing? How Left most and right most derivation helps to find out the ambiguity in a CFG?

5. Discuss the concept of Pumping Lemma for regular grammars. How Pumping Lemma is used to prove weather a given grammar is not a regular grammar?

6. What do you understand by tractable and Intractable problems with reference to Turing Machines?

SECTION-C

7. What is Turing Machine? Explain the different variants of Truing Machines.

8. Discuss Push down Automation in detail. Design PDA for {wcwT | w={a,b}*}

9. **Write a Short note on :**

   a. Minimization of FA

   b. Cook Levin Theorem

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.