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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 Turing Machines.
8. Discuss Push down Automation in detail. Design PDA for $\{wcwT \mid w=\{a,b\}^*\}$
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.