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Total No. of Pages : 02

Total No. of Questions : 09

# B.Tech.(CSE) (Sem.-7,8) THEORY OF COMPUTATION Subject Code : BTCS-702 M.Code : 71894 Date of Examination : 02-01-2023

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. Answer briefly :

- a) Write some applications of TOC.
- b) Define Grammar.
- c)  $\Sigma = \{0,1\}$ , Write RE for the alphabet whose 9th symbol from the L.H.S is 1.
- d) Define Derivation Tree and Yield of Tree.
- e) Define instantaneous description of a Turing Machine
- f) Why do we need different normal forms for CFG?
- g) How PDA is different from FA?
- h) Define Regular grammar.
- i) What is meaning of acceptability of string by FA?
- j) What is halting problem?

## **SECTION-B**

- 2. Discuss the procedure for converting NDFA to DFA with the help of a suitable example.
- 3. What are regular expressions? Can regular expressions be converted in to Finite Automation? Justify your answer with the help of example.
- 4. What is Pumping Lemma? How pumping lemma is used to prove that a given grammar is not a regular grammar?
- 5. Discuss the concept of left most derivation and right most derivation in reverse with the help of examples.
- 6. What is a normal form? Explain the Chomsky normal form and write its benefits.

## **SECTION-C**

- 7. What is a Context Free Grammar? Prove that If LI and If L2 are two context free languages, their union  $LT \cup L2$  will also be context free.
- 8. Explain the concept of Turing Machine. Construct a TM for  $L = \{0^n l^n 2^n | n \ge l\}$ .
- 9. Discuss Chomsky classification of Grammars with the help of writing rules for each type of grammars and show the correspondence of each type of automata with the grammars.

# 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.