

Roll No.

Total No. of Pages : 02

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B.Tech. (AI&DS/BlockChain/CSE/CS/CSD/DS) (Sem.-5)

FORMAL LANGUAGE & AUTOMATA THEORY

Subject Code : BTCS 502-18

M.Code : 93938

Date of Examination : 24-11-2025

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 CFG.
- b) What is PDA?
- c) What is Type 1 grammar?
- d) What are the types of TM?
- e) Define finite automata.
- f) What are the limitations of TM?
- g) Differentiate between NP-Hard and HP- complete.
- h) Mention the differences between DFA, NFA.
- i) List closure properties of regular languages.
- j) What is the difference between Regular and context free grammar?

SECTION - B

2. Explain briefly about DFA and NFA.
3. Explain about the graphical notation of PDA.
4. Explain the various types of Turing machine.
5. Define relations on set and explain its property with an example.
6. State and explain rice theorem.

SECTION - C

7. Draw a DFA to accept string of 0's and 1's ending with the string 011.
8. Construct a regular grammar for $(ab+a)^*(aa+b)$.
9. Explain with diagram for the working of a TM model?

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.