

A-1107

Total Pages : 3

Roll No.

MCA-18

MCA

(Formal Languages and Automata)

5th Semester Examination, 2024 (June)

Time : 2:00 Hrs.

Max. Marks : 70

Note :- This paper is of Seventy (70) marks divided into Two (02) Sections 'A' and 'B'. Attempt the questions contained in these Sections according to the detailed instructions given therein. *Candidates should limit their answers to the questions on the given answer sheet. No additional (B) answer sheet will be issued.*

Section-A

(Long Answer Type Questions) 2×19=38

Note :- Section 'A' contains Five (05) Long-answer type questions of Nineteen (19) marks each. Learners are required to answer any *two* (02) questions only.

1. Explain the use of finite automata with the help of an example.
2. Construct the Finite automata for the regular expression $(a*b + b*a)*a$.
3. Discuss the application of Pumping lemma.
4. What is Grammar ? Discuss Chomsky Classification of Languages in detail.
5. When a Context-Free Grammar (CFG) is said to be ambiguous ? Show that the following grammar is ambiguous : $S \rightarrow SbS \mid a$.

Section–B

(Short Answer Type Questions) $4 \times 8 = 32$

Note :- Section 'B' contains Eight (08) Short-answer type questions of Eight (08) marks each. Learners are required to answer any *four* (04) questions only.

1. Define NFA. What are the differences between DFA and NFA ?
2. Define Turing machine. What are its uses ?
3. Define Context Free Grammar (CFG) with example.

4. What is the difference between CFG and CSG ?
5. What is an instantaneous description (ID) of push down automaton (PDA) ? Give an example.
6. What is ambiguous grammar ? Does $S \rightarrow aSbS \mid bSaS \mid \epsilon$ ambiguous ?
7. Differentiate Finite Automata vs. Pushdown Automata,
8. Explain how we can convert a NFA to DFA.
