

# C1036

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## MCA-E4

### Formal Languages and Automata

Master of Computer Application (MCA)

4th Semester Examination, 2022 (June)

**Time : 2 Hours]**

**Max. Marks : 80**

**Note :** This paper is of Eighty (80) marks divided into two (02) Sections A and B. Attempt the questions contained in these sections according to the detailed instructions given therein.

### SECTION-A

#### (Long Answer Type Questions)

**Note :** Section 'A' contains Five (05) long answer type questions of Twenty (20) marks each. Learners are required to answer any Two (02) questions only.

(2×20=40)

1. What is Language? Explain about the natural languages programming languages, mathematical languages?

2. What is the difference between NFA and DFA? How can we convert NFA to DFA?
3. Why Regular expression and Finite automata are equivalent? Explain with the help of example.
4. What is Moore machine? What do you understand by equivalence of Moore and Mealy machines?
5. (a) What are Special boundary cases of Turing Machine?  
(b) What are moves of Turing Machine ? Explain your answer.

### **SECTION-B**

#### **(Short Answer Type Questions)**

**Note :** Section 'B' contains Eight (08) short answer type questions of Ten (10) marks each. Learners are required to answer any Four (04) questions only. (4×10=40)

1. What is Grammar? Give the Formal definitions of a Grammar?
2. What is Transition table? How can we remove epsilon transition?
3. What is precedence rule? Explain.
4. Write Algorithm to decide emptiness?

5. What is PDA? Explain with example.
  6. What is CFL and DCFL?
  7. What is CNF and what are steps for CNF to be in CFG?
  8. Explain CYK Algorithm.
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