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Reg. No.................................

Name....................................

INTEGRATED M.C.A. (I.M.C.A.) DEGREE EXAMINATION, JULY 2025

Eighth Semester

IMCA 801—SYSTEM SOFTWARE AND AUTOMATA

(2019 and 2018 Admissions—Supplementary/2017 Admissions—Mercy Chance)

Time : Three Hours | Maximum Marks : 75

Part A

Answer any **ten** *questions.*

Each question carries 3 *marks.*

1. Give the basic mathematical notation and techniques used in finite automata.
2. Distinguish between the DFA and NDFA.
3. What do you mean by finite automaton ?
4. What are the different types of addressing modes in system software ? Explain.
5. Show the assembler algorithm and data structures.
6. Explain the rules for arithmetic expressions with example.
7. Write a note on JSUB instructions.
8. Describe the algorithm for Pass 1 of a linking loader.
9. Define: “Bootstrap Loader”.
10. Recall the typical MS-DOS object module.
11. State the use of macros in a SIC/XE program.
12. What is the use of macro time conditional statements ?

$(10 \times 3 = 30)$

Turn over

Part B

Answer **all** *questions.*

Each question carries 9 *marks.*

13. (a) Evaluate the purpose of Context Free Grammars and Languages.

Or

(b) Discover the techniques for Turing machine construction.

14. (a) Estimate the data and instruction formats of SIC.

Or

(b) Draw and explain the Simplified Instructional Computer (SIC) machine architecture.

15. (a) Predict the different types of instruction formats and addressing modes in assembler.

Or

(b) Inference the symbol-defining statements in machine independent assembler.

16. (a) Elucidate the object program with relocation by modification records.

Or

(b) Rephrase the loading and calling of a subroutine using dynamic linking.

17. (a) Determine the macro processor algorithm and data structures.

Or

(b) Examine the Macro within Macro with simple example.

(5 × 9 = 45)