

Code No: R20A1202

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

III B.Tech II Semester Supplementary Examinations, April 2025**Automata and Compiler Design****(B.Tech-AIML)**

Roll No									
---------	--	--	--	--	--	--	--	--	--

Time: 3 hours**Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing **ONE** Question from each **SECTION** and each Question carries 14 marks.

SECTION-I

- | | | | BCLL | CO(s) | Marks |
|----|----------|--|-------------|--------------|--------------|
| 1 | A | Write the procedure to convert NFA to its equivalent DFA. | L1 | CO-I | [7M] |
| | B | How do you recognize the tokens? Explain it. | L1 | CO-I | [7M] |
| OR | | | | | |
| 2 | A | Minimize the following DFA ($\rightarrow$ Start state, * End state) | L3 | CO-I | [7M] |
- | | | |
|-----------------|---|---|
| | a | b |
| $\rightarrow A$ | B | D |
| B | C | E |
| C | B | E |
| D | C | E |
| * E | E | E |
- | | | | | | |
|--|----------|---|-----------|-------------|-------------|
| | B | Construct DFA accepting the set of all strings containing 101 as a substring. | L3 | CO-I | [7M] |
|--|----------|---|-----------|-------------|-------------|

SECTION-II

- | | | | | | |
|----|----------|---|-----------|--------------|-------------|
| 3 | A | Consider the following grammar
$S \rightarrow (L) \mid a$
$L \rightarrow L, S \mid S$
Construct leftmost derivations and parse trees for the following sentences:
$(a, (a, a))$
$(a, ((a, a), (a, a)))$. | L3 | CO-II | [7M] |
| | B | Identify the advantages and disadvantages of LR Parser. | L3 | CO-II | [7M] |
| OR | | | | | |
| 4 | A | Compose a predictive parser for the following grammar:
$E \rightarrow TE'$
$E' \rightarrow +TE' \mid \in$
$T \rightarrow FT'$
$T' \rightarrow *FT' \mid \in$
$F \rightarrow (E) \mid id$
Consider the predictive parsing table and show the stack implementation for the input string: $id+id*id$. | L5 | CO-II | [7M] |
| | B | Compute FIRST and FOLLOW for the following grammar. | L3 | CO-II | [7M] |

$S \rightarrow A$
 $A \rightarrow aB \mid Ad$
 $B \rightarrow bBC \mid f$
 $C \rightarrow g.$

SECTION-III

- | | | | | | |
|----------|----------|--|-----------|---------------|-------------|
| 5 | A | Write syntax directed definition for simple desk calculator.
Using this definition draw annotated parse tree for $3*5+4n$. | L1 | CO-III | [7M] |
| | B | Explore about the context sensitive features in terms of Chomsky hierarchy of languages. | L2 | CO-III | [7M] |

OR

- | | | | | | |
|----------|----------|--|-----------|---------------|-------------|
| 6 | A | Recognise the specification of simple type checker | L3 | CO-III | [7M] |
| | B | Explain Synthesized attribute, Inherited attribute, Dependency graph, Evaluation order with an example | L2 | CO-III | [7M] |

SECTION-IV

- | | | | | | |
|----------|----------|--|-----------|--------------|-------------|
| 7 | A | Describe in detail about dynamic storage allocation. | L1 | CO-IV | [7M] |
| | B | What are the functions of Local Optimization? Explain each function with an example. | L1 | CO-IV | [7M] |

OR

- | | | | | | |
|----------|----------|---|-----------|--------------|-------------|
| 8 | A | Discuss the following:
i. Copy propagation
ii. Dead code elimination and code motion. | L2 | CO-IV | [7M] |
| | B | Explain in detail about peephole optimization techniques. | L4 | CO-IV | [7M] |

SECTION-V

- | | | | | | |
|----------|----------|--|-----------|-------------|-------------|
| 9 | A | Build the algorithm for the code generation from the three-address code. | L3 | CO-V | [7M] |
| | B | Explain in detail register allocation | L4 | CO-V | [7M] |

OR

- | | | | | | |
|-----------|----------|--|-----------|-------------|-------------|
| 10 | A | Discuss the code generation phase with simple code generation algorithm. | L2 | CO-V | [7M] |
| | B | Explain the characteristics of Machine Code Generator with an example. | L4 | CO-V | [7M] |
