



# MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AN AUTONOMOUS INSTITUTION)

(Approved by AICTE, New Delhi &amp; Affiliated to JNTUH, Hyderabad)

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III B.Tech II Sem Supply End Examination, January 2023

## Principles of Compiler Construction (Information Technology)

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

Note: 1. Question paper consists: Part-A and Part-B.

2. In Part - A, answer all questions which carries 20 marks.

3. In Part - B, answer any one question from each unit.

Each question carries 10 marks and may have a, b as sub questions.

**PART- A****(10\*2 Marks = 20 Marks)**

- |       |   |    |     |     |
|-------|---|----|-----|-----|
| 1. a) | Define regular expression?                                  | 2M | C01 | BL1 |
| b)    | What is token and lexeme?                                   | 2M | C01 | BL1 |
| c)    | Define context-free grammar?                                | 2M | C02 | BL1 |
| d)    | Define bottom-up parsing?                                   | 2M | C02 | BL1 |
| e)    | What is syntax directed translation why are they important? | 2M | C03 | BL1 |
| f)    | Define type systems?  | 2M | C03 | BL1 |
| g)    | What do you mean by DAG?                                    | 2M | C04 | BL1 |
| h)    | What is run-time environment?                               | 2M | C04 | BL1 |
| i)    | What is Frequency Reduction?                                | 2M | C05 | BL1 |
| j)    | What is data-flow analysis?                                 | 2M | C05 | BL1 |

**PART- B****(10\*5 Marks = 50 Marks)**

- |      |  |    |     |     |
|------|--|----|-----|-----|
| 2 a) | Explain in detail about grouping of phases in compiler.                            | 5M | C01 | BL2 |
| b)   | What is the role of regular expression in lexical analysis? Explain with examples. | 5M | C01 | BL4 |

**OR**

- |      |   |     |     |     |
|------|---|-----|-----|-----|
| 3    | Explain the various phases of compiler with suitable diagram?                                       | 10M | C01 | BL4 |
| 4 a) | What is top-down parsing? What are the problems in top-down parsing? Explain with suitable example. | 5M  | C02 | BL2 |
| b)   | Differentiate between top down and bottom-up parsing techniques.                                    | 5M  | C02 | BL2 |

**OR**

- |   |  |     |     |     |
|---|--|-----|-----|-----|
| 5 | Explain the algorithm to construct the LR (0) items and construct LR (0) items for the given grammar given in<br>A → A+B/B      B → B*D/D      D → (A)/id/num. | 10M | C02 | BL6 |
|---|--|-----|-----|-----|

- 6 a) Explain in brief about type checking and equivalence of type expressions. 5M C03 BL2
- b) Explain in detail about synthesized and inherited attributes. 5M C03 BL2
- OR**
- 7 Translate the expression  $(a+b)*(c+d)+(a*b/c)*b+60$  in to 10M C03 BL2  
quadruple, triple and indirect triple.
- 8 a) Draw the syntax tree and DAG for the given expression. 5M C04 BL4  
 $(a*b)+(c-d)*(a*b)+b$
- b) How symbol table can be managed? Explain. 5M C04 BL2
- OR**
- 9 Discuss about storage allocation strategies. 10M C04 BL2
- 10 a) Discuss about data-flow analysis and its properties. 5M C05 BL2
- b) Explain natural loops and inner loops of a flow graph with an example. 5M C05 BL2
- OR**
- 11 Explain in brief about different Principal sources of optimization techniques with suitable examples. 10M C05 BL2

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