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**Presidency University**

**Bengaluru**

 **School Of Computer Science and Engineering & Information Science**

**Summer Term End-Term Examinations, August 2024**

**Date**: 06-08-2024

**Time**: 09:30AM TO 12:30PM

**Max Marks**: 100

**Weightage**: 50%

**Odd Semester**: 2023 - 24

**Course Code**: CSE3167

**Course Name**: COMPILER DESIGN

**Department:** CSE

 **Instructions:**

1. *Read the all questions carefully and answer accordingly.*
2. *Do not write any matter on the question paper other than roll number.*

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| **Q.No** | **Questions** | **Marks** | **CO** | **RBT** |
| 1 | 1. Define Token? Explain different Types of Tokens.
 | 4 | CO1 | L1 |
| 1. Explain role of Lexical Analyzer with a neat Diagram.
 | 6 | CO1 | L2 |
| 1. Explain different phases of Compiler with a neat Diagram.
 | 10 | CO1 | L3 |
| OR |
| 2 | 1. What do you mean by Cross-Compiler? Explain.
 | 4 | CO1 | L1 |
| 1. Make use of following example to illustrate phases of compiler

T = P + I \* 60  | 6 | CO1 | L2 |
| 1. List issues in Lexical Analyzer? What is Lexical Error? Explain about lexical errors?
 | 10 | CO1 | L3 |

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| 3 | 1. What is an ambiguous grammar? Give example.
 | 4 | CO2 | L1 |
| 1. Explain in detail the effectiveness of different compiler construction tools in handling language grammars?
 | 6 | CO2 | L2 |
| 1. How do you check whether the given grammar is LL(1) or not? Write Algorithm.
 | 10 | CO2 | L3 |

OR

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| 4 | 1. Define Left Factoring? Explain with an example.
 | 4 | CO2 | L1 |
| 1. Make use of the following Grammer to solve

E-> T+E | TT-> T\*F | FF-> (E) | id1. Remove Ambiguity
2. Calculate First and Follow
 | 6 | CO2 | L2 |
| 1. Make use of the following Grammer to solve

E-> T+E | TT-> T\*F | FF-> (E) | id1. Construct Predictive Parsing Table
2. Parse the “ id + id $ ” input string
 | 10 | CO2 | L3 |

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| 5 | 1. Define Parser? Explain different types of Parsers.
 | 4 | CO3 | L1 |
| 1. Make use of the following Grammer to solve

E-> T+E | TT-> T\*F | FF-> (E) | id1. Write Augmented Grammar
2. Construct LR(0) items
 | 6 | CO3 | L2 |
| 1. Make use of the following Grammer to solve

E-> T+E | TT-> T\*F | FF-> (E) | id1. Construct ACTION and GOTO Table
2. Parse the input String id\*id$
 | 10 | CO3 | L3 |

OR

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| 6 | 1. What is Handle Pruning? Explain Process of Handle Pruning.
 | 4 | CO3 | L1 |
| 1. What are the rules to be followed to calculate FIRST and Follow?
 | 6 | CO3 | L2 |
| 1. Check whether the following grammar is LL(1) or not

S -> iEtSS’ | aS’ -> eS | epsilonE -> b | 10 | CO3 | L3 |

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| 7 | 1. What is Type Checking and Type Conversion? Explain different types of Type Checking and Type Conversion?
 | 4 | CO4 | L1 |
| 1. Define attributes? List the types of attributes? Make use of an example to explain each type of attributes?
 | 6 | CO4 | L2 |
| 1. Construct a syntax directed definition (i.e. semantic rules) for the given

grammar and show the annotated parse tree for expression (3 + 4) \* (5 + 6). G= { L->EE->E+TE->TT->T\*FT->FF->(E)F->digit } | 10 | CO4 | L3 |

OR

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| 8 | 1. Differentiate S-Attributed and L-Attributed Grammar?
 | 4 | CO4 | L1 |
| 1. Make use of following code fragment to convert it as Three address code? Write three address statements in Quadruples, Triples and Indirect Triples?

n = 5;for ( i = 0 ; i < = n ; i + + ){a = b + c \* d – e / f ;x = y + z ; }  | 6 | CO4 | L2 |
| 1. Write SDT for Binary to Decimal? Construct Annotated parse tree for the given binary number “1 0 1 0 1 1”.
 | 10 | CO4 | L3 |

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| 9 | 1. What is Leader? Write rules to identify Leader Statements?
 | 4 | CO1 | L1 |
| 1. Explain flow of control optimization with a suitable example?
 | 6 | CO1 | L2 |
| 1. Illustrate various code optimization techniques with suitable example each?
 | 10 | CO1 | L3 |

OR

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| 10 | 1. Explain Dependency Graph with an example?
 | 4 | CO2 | L1 |
| 1. Define basic blocks and list its characteristics?
 | 6 | CO2 | L2 |
| 1. Illustrate various Principal Sources of optimization techniques with suitable example each?
 | 10 | CO2 | L3 |