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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 | T  T-> T\*F | F  F-> (E) | id   1. Remove Ambiguity 2. Calculate First and Follow | 6 | CO2 | L2 |
| 1. Make use of the following Grammer to solve   E-> T+E | T  T-> T\*F | F  F-> (E) | id   1. 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 | T  T-> T\*F | F  F-> (E) | id   1. Write Augmented Grammar 2. Construct LR(0) items | 6 | CO3 | L2 |
| 1. Make use of the following Grammer to solve   E-> T+E | T  T-> T\*F | F  F-> (E) | id   1. 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’ | a  S’ -> eS | epsilon  E -> 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->E  E->E+T  E->T  T->T\*F  T->F  F->(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 |