Exam Number: _____

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B.E. SEMESTER – VII (NEW) EXAMINATION MARCH - 2025

Subject Name: Language Processors and Compiler Design **Subject Code: CS701-N**

Date: 27/03/2025 (Thursday) **Time: 12:30 p.m. to 03:30 p.m.** **Total Marks: 70**

Instructions:

1. **All questions are compulsory.**
2. **Figures to the right indicate full marks.**
3. **Indicate clearly, the options you attempt along with its respective question number.**
4. **Use the last page of main supplementary for rough work.**

Section-I

Q.1 (A) Define following terms: [5]

1. Compiler 2. Interpreter 3. Linker 4. Loader 5. Preprocesssor

(B) Write a brief note on input buffering techniques. [5]

(C) Give the rule to remove left recursive grammar. And Eliminate left recursion from following grammar. [5]

$S \rightarrow Aa \mid b$

$A \rightarrow Ac \mid Sd \mid f$

OR

(C) Explain Left factoring with example. [5]

Q.2 (A) Draw NFA from regular expression using Thomson's construction and convert it into DFA. (a + b)*abb [5]

(B) Design FIRST and FOLLOW set for the following grammar. [5]

$S \rightarrow 1AB \mid \varepsilon$

$A \rightarrow 1AC \mid 0C$

$B \rightarrow 0S$

$C \rightarrow 1$

OR

Q.2 (A) What is ambiguous grammar? Show that $S \rightarrow aSbS|bSaS|\in$ is an ambiguous grammar. [5]

(B) Construct an SLR Parsing table for the following grammar. [5]

$E \rightarrow E + T|T$

$T \rightarrow TF|F$

$F \rightarrow F^*|a|b.$

Q.3 (A) Explain recursive decent parsing technique with suitable example. [5]

(B) Differentiate Top Down Parsing and Bottom up parsing. [5]

OR

Q.3 (A) Explain annotated parse tree with suitable example. [5]

(B) Explain panic mode and phrase level error recovery techniques in detail. [5]

Section-II

Q.4 (A) Compare: Static v/s Dynamic Memory Allocation. [5]

(B) Translate the expression – (x + y) * (y + z) + (x + y + z) into Quadruples, Triples, and Indirect triples. [5]

(C) What is regular Expression? Write the regular expression R over {0,1} or {a,b}: [5]

1) The set of all strings with even number of a's followed by an odd number of b's.

2) The set of all strings that consist of alternating 0's and 1's

OR

(C) Discuss the issues in the Design of a Code Generator. [5]

Q.5 (A) What is Macro? Explain Macro Expansion in detail. [5]

(B) Consider the following expression and construct a DAG for it- [5]

$$X = (a + b) x (a + b + c)$$

OR

Q.5 (A) Explain function of symbol table. [5]

(B) Explain any three code optimization techniques with suitable example. [5]

Q.6 (A) Give the difference between synthesized attributes and inherited attributes. [5]

(B) Explain Design of a Two Pass Assembler. [5]

OR

Q.6 (A) Explain global data analysis in detail. [5]

(B) Explain Software Tools for Program Development: LEX, YACC. [5]