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COMPILER DESIGN MID SEMESTER EXAM

Maximum marks: 30

Date: 03/03/25

Duration: 120 mins

Instructor: Dr. Abhinesh Kaushik

Note:

- Read questions carefully. Understand a question before you start writing.
- Be clear and to the point. You will lose points for rambling and for incorrect or irrelevant statements

Ques 1. Differentiate between compiler and interpreter. "Symbol table is a necessary component of compiler", justify this statement with examples. (3+3)

Ques 2. Define Left recursive grammar. Remove left recursion from the following grammar.

$S \rightarrow SB \mid Ca$

$B \rightarrow Bb \mid c$

$C \rightarrow aB \mid a$

(6)

Ques 3. The lexical analysis for a modern computer language such as Java needs the power of which machine models in a necessary and sufficient sense? Explain with the help of an example. Also find the total number of tokens in `printf("i=%d, &i=%x", i, &i);` (6)

Ques 4. Check the following Grammar if it is LL(1) with the help of LL(1) parsing table? Parse the sentence $x - 3 \times y$ using the following grammar using LL(1) Parser. Also Write First and Follow of all the variables. (4+4+4)

1. $E \rightarrow TE'$

2. $E' \rightarrow +TE'$

3. $\mid -TE'$

4. $\mid \epsilon$

5. $T \rightarrow FT'$

6. $T' \rightarrow \times FT'$

7. $\mid \div FT'$

8. $\mid \epsilon$

9. $F \rightarrow (E)$

10. $\mid \text{num}$

11. $\mid \text{id}$