Reg. No.														

B.Tech. DEGREE EXAMINATION, MAY 2023
Fifth Semester

CS0301 – COMPILER DESIGN
(For the candidates admitted from the academic year 2007-2008 to 2012-2013)

Time: Three Hours Max. Marks: 100

Answer **ALL** Questions
PART – A (10 × 2 = 20 Marks)

1. What is macro expansion? Give example.
2. Give the grammar for conditional statements: (IF, THEN, ELSE).
3. Draw NFA for $R = (a^+ \mid b^+)b$.
4. What are the complier construction tools?
5. Find FOLLOW elements in
   S → (L) / S
   L → L, S / S
6. Eliminate left recursion if any
   S → Aa / b
   A → Sc / d
7. What are the fields available in activation record?
8. Define annotated parse tree?
9. Represent the following statement in Three address form and syntax tree
   " a or b and not c"

10. Eliminate redundancy if any and rewrite the code
    Y = C + D * T;
    C = C + D;
    X = C + D;

PART – B (5 × 16 = 80 Marks)

11. a. Discuss single pass assembler and its design steps.

(OR)

b. Describe the Linkage Editor and Loading Process.

12. a. Convert the regular expression to DFA $R = (ab \mid ba)^* b$.

(OR)

b.i. Briefly explain about the role of lexical analyzer. (10 Marks)

ii. Write short notes on recognition of tokens. (6 Marks)

13. a. Construct LR (0) items for the following grammar
    E → E + T / T
    T → TF / F
    F → F* / a / b

(OR)

b. Construct operator precedence parsing table for the grammar given below using LEADING and TRAILING sets.
    E → E + T / T
    T → T*F / F
    F → (F) / id

14. a. Write the syntax directed definition for desk calculator application grammar and draw the annotated parse tree.

(OR)

b. What is a type expression? Give an example of a type checking system for expressions and statement.

15. a. Design a simple code generator.

(OR)

b. Write short notes on
    (i) Peephole optimization
    (ii) Loop optimization

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