

**Roll No.**

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**Total No. of Pages : 02**

**Total No. of Questions : 09**

**B.Tech. (CSE) (Sem.-6)**

# COMPILER DESIGN

**Subject Code : BTCS601-18**

**M.Code : 79249**

**Date of Examination : 23-05-2025**

**Time : 3 Hrs.**

**Max. Marks : 60**

### INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

## SECTION-A

1. **Answer briefly :**
- a) What are the techniques behind the code optimization phase?
  - b) What is compiler? Explain at least 4 classifications of Compilers.
  - c) What is LL(1) parser? What are the necessary conditions for a grammar to be in LL(1).
  - d) What do you mean by Context free grammar? List its 4 components.
  - e) Eliminate Left Recursion from the grammar :  
$$E \rightarrow E + T \mid E - T \mid T$$
$$T \rightarrow T * F \mid T / F \mid F$$
$$F \rightarrow (E) \mid id$$
  - f) Define preprocessor. What are its functions?
  - g) What is front-end and back-end of the compiler?
  - h) Differentiate between stack allocation and static allocation.
  - i) Write a brief note on symbol tables.

- j) What is left Factoring? What are the rules to make a grammar free from left Factoring?

### SECTION - B

2. Explain the working and algorithm of LR parser.
3. Explain the various phases of a compiler in detail. Also write the output for the following expression after each phase  $a=b*c-d$ .
4. Write algorithm to convert NFA from Regular expression.
5. Explain in detail about run time storage management.
6. Explain about peep hole optimization.

### SECTION - C

7. Construct the canonical LR parsing Table for the following grammar:

$S \rightarrow L=R$

$S \rightarrow R$

$L \rightarrow *R$

$L \rightarrow id$

$R \rightarrow L$

8. What are the basic Blocks and Flow Diagram, explain Efficient Data Flow algorithm in detail.
9. Explain how different phases of Compilation will operate and convert the following statement  $Interest = principal * rate / 100$  (assuming Rate data-type is Float)

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**