

Roll No.

Total No. of Pages : 02

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B.Tech.(AI&ML / AI&DS(AI) / CSE / DS)(Sem.-7)

COMPILER DESIGN

Subject Code :BTCS 601-18

M.Code :93988

Date of Examination:29-11-2025

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. Write briefly :

- a) Construct a Context-Free Grammar (CFG) for roman numerals.
- b) How to left factor the grammar? Give Example.
- c) What is code optimization? How is it achieved?
- d) Differentiate between NFA and DFA.
- e) How the Garbage collection works through reference counting?
- f) Discuss about Instruction Selection and Register allocation.
- g) Compare synthesis and inherited translation.
- h) What is the role of Control stack in runtime support package?
- i) List out the rules for FIRST and FOLLOW.
- j) Explain the advantage of inter procedural optimization.

SECTION - B

2. Explain the various issues of code generation in compiler design.
3. What is an Abstract syntax tree? How to construct it? Explain by writing syntax directed definition.
4. Compare the various forms of three address code.
5. Construct the CLR parsing table for the following grammar:

$$S \rightarrow L=R \mid R$$
$$L \rightarrow *R \mid \text{id}$$
$$R \rightarrow L$$

6. Explain the error recovery actions in a lexical analyzer.

SECTION - C

7. Draw a block diagram of phases of a compiler and identify the main functions of each phase.
8. Consider the pseudo code for quick sort and perform all the function preserving transformation techniques on flow graph of it.
9. How to generate object code for $X=Y+Z*15$ through different phases of compiler?

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.