

## III B. Tech I Semester Regular Examinations, February-2022

**COMPILER DESIGN**

(Information Technology)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions **ONE** Question from **Each unit**

All Questions Carry Equal Marks

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**UNIT-I**

1. a) Explain in detail about the different phases of compiler. [8M]  
 b) Illustrate how transition diagram is helpful in lexical analyzer. [7M]

**(OR)**

2. a) Describe about the LEX tool in detail. [8M]  
 b) Give the features of Compiler-Construction tools. [7M]

**UNIT-II**

3. a) Construct predictive parsing table for the following grammar: [8M]  
 $S \rightarrow (L) \mid a \quad L \rightarrow L, S \mid \text{Sand}$  and check whether the string  
 $(a, ((a, a), (a, a)))$  belongs to that language or not.  
 b) Write an algorithm for constructing SLR parsing table [7M]

**(OR)**

4. a) a) Write the steps to remove left recursion and design LL(1) [8M]  
 predictive parser for the grammar:  
 $E \rightarrow E+E \mid E-E \mid E^*E \mid E \setminus E \mid (E) \mid id$   
 b) Explain shift-reduce parsing with stack implementation. [7M]

**UNIT-III**

5. a) Write about polymorphic functions. [8M]  
 b) What is syntax tree? How to construct a syntax tree for an [7M]  
 expression?

**(OR)**

6. a) Write the SDD for expressions and construct a syntax tree for the [8M]  
 expression  $a-4*c$ .  
 b) Write the translation scheme for type checking of function [7M]  
 declaration.

**UNIT-IV**

7. a) Explain about the storage allocation strategies. [8M]  
 b) Explain the design issues for code generator phase. [7M]

**(OR)**

8. a) What is peephole optimization? How can it be performed? Give [8M]  
 its role in code generation.  
 b) Explain about the construction of DAG and write its application. [7M]

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**UNIT-V**

9. a) Explain about loops in flow graphs. [8M]  
b) Discuss about principal sources of optimization with neat diagrams. [7M]

**(OR)**

10. a) Specify the necessary and sufficient conditions for performing [8M]  
(i) Constant Folding (ii) Dead Code Elimination (iii) Code Motion  
(iv) Induction Variable Elimination  
b) Define flow graph. Explain the optimization of Basic Blocks. [7M]

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