Code No: 155EG **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, January/February - 2023
COMPILER DESIGN
(Computer Science and Engineering – Artificial Intelligence and Machine Learning)
Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a)	Difference between a Compiler and an Interpreter.	[2]
b)	What is the structure of C compiler?	[3]
c)	What is Parsing?	[2]
d)	Differentiate between Top-Down Parsing and Bottom-Up Parsing.	[3]
e)	What are the applications of Syntax Directed Translation?	[2]
f)	Define Type Checking.	[3]
g)	What is a Target Language?	[2]
h)	List out different addresses in the Target Code?	[3]
i)	Define flow graph.	[2]
j)	What is meant by constant propagation?	[3]

PART – B

(50 Marks)

2.a) Discuss the action taken by every phase of compiler on the following instruction of Source Program while compilation id=id+id*60.
b) What do you understand by the terms Tokens, Patterns, and Lexemes? [6+4]

OR

3.a) What is a Finite Automata? Explain briefly about NFA and DFA.
b) Write an algorithm to convert a given NFA into an equivalent DFA. [6+4]

4.a) Consider the following grammar and construct predictive parsing table.

expr → expr + term
expr → term
term → term * factor
term → factor
factor → (expr)
factor → id

b) What do you mean by Left Recursive Grammar? Write an algorithm to eliminate Left Recursion. [6+4]

OR

5. Write down the algorithm for Recursive-Decent parsing. Explain RD parsers with an example. [10]

6.a) Compare Syntax-Directed Translation and Syntax-Directed Definition
b) Obtain the Syntax Directed Definition for a simple basic calculator. [5+5]

OR

7.a) Explain about Annotated Parse Tree with example.
b) Compare S-attributed definitions and L-attributed definitions. [5+5]

8. Elaborate the following:
a) Garbage Collection
b) Trace-Based Collection. [5+5]

OR

9.a) Write an algorithm for partitioning of three-address instructions into a basic block.
b) Explain the role of Flow graph in basic blocks. [5+5]

10.a) Explain in detail about the instruction scheduling with an example.
b) What are the principle sources of optimization? Give the classification of code optimization? [5+5]

OR

11.a) Differentiate between Machine-dependent and Machine-independent Optimization.
b) Outline the basic terms of data flow analysis. [5+5]

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