Code No: 156AH **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, February - 2023
COMPILER DESIGN
(Computer Science and Engineering)

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)	Define linker and loader.	[2]
b)	Write a short note on regular expression.	[3]
c)	Explain context free grammar.	[2]
d)	Compute FIRSTs and FOLLOWs for the following grammar R→R+R, R→R*R, R→R/R, R→(R), R→id	[3]
e)	What are the evaluation orders for syntax directed definitions?	[2]
f)	Explain the variants of syntax trees.	[3]
g)	What is trace based collection?	[2]
h)	Explain the addresses in the target code.	[3]
i)	Define strength reduction.	[2]
j)	Discuss about common sub expression elimination.	[3]

PART – B

(50 Marks)

2. Define compiler. Explain various phases of compiler with neat sketch. [10]

OR

3.a) Explain various error recovery strategies in lexical analysis.
b) Construct a Finite automata and scanning algorithm for recognizing identifiers, numerical constants in 'C' language. [5+5]

4.a) What is left recursion? Describe the algorithm used for eliminating left recursion.
b) Eliminate left recursion in the following grammar:
E → E + T / T, T → T * F / F, F → (E) / id [5+5]

OR

5.a) Write an algorithm for computing LR(K) item sets.
b) Differentiate between Top down and Bottom up parsing techniques. [5+5]

6.a) Construct a Quadruple, Triple and Indirect triple for the statement
a + a * (b – c) + (b – c) * d
b) How are inherited attributes differ from synthesized attributes? [6+4]

OR

7. Give syntax directed translation scheme for simple desk calculator. [10]

8. Explain various storage allocation strategies with an example. [10]

OR

9.a) What is a basic block? How to construct a basic block?

b) Explain peephole optimization with an illustrative example. [5+5]

10. Explain the following with an example

a) Constant Propagation

b) Partial Redundancy Elimination. [5+5]

OR

11.a) Explain loop optimization techniques with example.

b) Explain various notations used in data flow analysis. [5+5]

---ooOoo---