Exam.Code:0918
Sub. Code: 6410

2023

B.E. (Computer Science and Engineering)

Sixth Semester

CS-604: Compiler Design

Time allowed: 3 Hours **Max. Marks: 50**

NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Section.

x-x-x

I. Write short answers of the following:

a. What is loop unrolling and loop jamming?
b. Differentiate between S-attributed and L-attributed definitions.
c. What is an activation record? List various fields/parts of an activation record.
d. What is difference between a parse tree and a syntax tree?
e. What is left recursion? Differentiate between immediate and indirect left recursion.

(2 marks each)

Section-A

II.

a. What do you mean by phase of a compiler? Describe various phases of compiler in detail.
b. Define handle. What are the issues involved in handle pruning? How is handle pruning implemented by operator precedence parser? **(5, 5)**

III.

a. Describe an algorithm for constructing SLR parsing table. Construct SLR parsing table for the grammar:

$E' \rightarrow E$
$E \rightarrow E + T \mid T$
$T \rightarrow T * F \mid F$
$F \rightarrow (E) \mid id$

b. Write an algorithm to remove left recursion from a given grammar. Eliminate the left recursion from the grammar:

$S \rightarrow (L) \mid a$
$L \rightarrow L,S \mid S$

(5, 5)

IV.

a. Construct the LALR parsing table for the following grammar:

$E \rightarrow E+T \mid T$
$T \rightarrow TF \mid F$
$F \rightarrow F^* \mid a \mid b$

b. What are predictive parsers? Write down the rules to construct the predictive parsing table. **(5,5)**

Section-B

V.

a. What are basic blocks? Describe the steps of partitioning a sequence of three-address statements into list of basic blocks.
b. What are synthesized and inherited attributes? Describe in detail the bottom-up evaluation of S-attributed definitions. **(5,5)**

VI.

a. With the help of examples, describe in detail the principal sources of code optimization.
b. Describe in brief data structures used for storing symbol table. **(5,5)**

VII.

a. Explain in detail stack and heap storage allocation strategies.
b. What are the issues that must be taken care off while designing a code generator? **(5,5)**

x-x-x