B. TECH.
(SEM V) THEORY EXAMINATION 2022-23
COMPILER DESIGN

Time: 3 Hours   *Total Marks: 100*

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1.   **Attempt *all* questions in brief.**   **2 x 10 = 20**

(a) What is a lexeme? Define a regular set.
(b) What is a predictive parser?
(c) List the properties of LR parser.
(d) Give the applications of DAG.
(e) Define backpatching.
(f) Draw the transition diagram for an identifier.
(g) Differentiate analysis and synthesis phase.
(h) What are the functions of error handler?
(i) Define a syntax-directed translation.
(j) Define loop jamming with an example.

SECTION B

2.   **Attempt any *three* of the following:**   **10 x 3= 30**

(a) Construct a DFA that accepts a language L over input alphabets $\sum = \{a, b\}$ such that L is the set of all strings starting with 'aa' or 'bb'.
(b) Define the following terms and give suitable example for it.
    i)   Handle
    ii) Handle pruning
    iii) Left Factoring
(c) Construct CLR parsing table for the following grammar.
$$S \rightarrow CC$$
$$C \rightarrow cC \mid d$$
(d) Explain various data structures used in symbol table management.
(e) Define DAG. Explain DAG representation of basic block with example.

SECTION C

3.   **Attempt any *one* part of the following:**   **10 x 1= 10**

(a) Explain stack implementation of shift reduce parser.
(b) What is left recursion? Eliminate the left recursion from the following grammar.
$$E \rightarrow E + T \mid T$$
$$T \rightarrow T * F \mid F$$
$$F \rightarrow (E) \mid id$$

4.   **Attempt any _one_ part of the following:**   **10 x 1= 10**

(a) Discuss differences between inherited attributes and synthesized attributes.
(b) Explain various dynamic storage allocation techniques.

5.   **Attempt any _one_ part of the following:**   **10 x 1= 10**

(a) What is an activation record? Explain how they are used to access local and global variables.
(b) Explain syntax directed translation scheme for Infix to Postfix conversation with example.

6.   **Attempt any _one_ part of the following:**   **10 x 1= 10**

(a) Generate three address code for the following code segment
   While (a<b) do
        If (c<d) then x= y+z
(b) Explain different error recovery techniques with suitable example.

7.   **Attempt any _one_ part of the following:**   **10 x 1= 10**

(a) What is intermediate code? Explain different types of intermediate coderepresentations. Also discuss importance of intermediate code.
(b) Explain in detail about the data-flow schemas on basic block and the transfer equations for reaching definitions with example.