(T) Roll No. .....

PAPER ID—11443

B. Tech. EXAMINATION, 2025

(Sixth Semester)

COMPUTER SCIENCE AND ENGINEERING

Compiler Design

Time : 3 *Hours* *Maximum Marks :* 70

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

1. Describe the following : **14**

(a) Input buffering

(b) Parsing

(c) LALR

(d) Machine depended code

(e) SDT

(f) Role of parsers.

Unit I

2. What is Compiler ? Explain the complete structure including phases of Compiler in detail with neat and clean diagram.Why do we need translator ? Explain. **14**

3. How do we implement lexical analyzer ? Explain with example.Construct the NFA for the following regular expression :

$$R = (a \mid b)^*abb.$$ **14**

Unit II

4. (a) Explain the role of parser in detail with suitable example.

(b) Explain and remove the ambiguity from the following CFG :

$E \rightarrow E + E \mid E - E \mid E/E \mid E*E \mid (E) \mid -E \mid id.$ **14**

5. (a) Explain shift-reduce parsing with the help of an example.

(b) Test whether the grammar is LL (1) or not and construct a predictive parsing table for it :

$S \rightarrow iCtSS' \mid a.$

$S' \rightarrow eS \mid \varepsilon$

$C \rightarrow b.$ **14**

Unit III

6. (a) Construct an SLR (1) parsing table for the following grammar :

$S \rightarrow xAy \mid xBy \mid xAz$

$A \rightarrow aS$

$B \rightarrow q.$

(b) Check whether the following grammar is LR (1) or not ?

$S \rightarrow CC$

$C \rightarrow cC \mid b.$ **14**

7. (a) What do you mean by intermediate code generation ? Explain various intermediate code generation schemes.Convert the following statements into the Quadruple, Triple and Indirect triple representation :

$$X = (A + B)*(C - D)/E.$$

(b) How syntax directed translation scheme is implemented ? Explain with example. **14**

Unit IV

8. What is Symbol Table ? Explain in detail about its contents and data structure. **14**

9. Write short notes on the following : 14

(a) Basic blocks and flow graph

(b) Peephole optimization

(c) DAG

(d) Loop Unrolling and Loop Jamming.

