

Roll No.

Total Pages : 03

BT-7/M-21: 47023
COMPILER DESIGN
IT-455

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt *Five* questions in all. Q. No. **1** is compulsory.
In addition to that attempt *four* more questions selecting exactly *one* question from each Unit.

Unit I

1. What are the various compiler construction tools ? Explain in detail. **15**
2. Draw a flow diagram for showing the phases of a compiler and discuss each phase in detail. **15**

Unit II

3. (a) Describe the role of a parser in a compiler. How different types of errors can be handled by a parser ? **8**
- (b) Differentiate between regular expression and CFG. **7**

4. (a) Write down an algorithm for detecting unreachable entries in a LR parsing table.
- (b) Construct error-correcting LR parser for the following grammar : 7.5

$$\begin{aligned} \text{stmt} \rightarrow & \textit{if } e \textit{ then stmt} \\ & | \textit{if } e \textit{ then stmt else stmt} \\ & | \textit{while } e \textit{ do stmt} \\ & | \textit{begin list end} \\ & | s \end{aligned}$$

$$\begin{aligned} \text{list} \rightarrow & \text{list; stmt} \\ & | \text{stmt} \end{aligned} \quad \text{7.5}$$

Unit III

5. (a) Give a syntax-directed definition to translate infix expression into infix expression without redundant parentheses. For example, since + and * associative to the left, $((a*(b+c)*(d)))$ can be rewritten as $a*(b+c)*d$. 5
- (b) What do you understand by three-address code ? Explain common three-address statement in use. 7
- (c) What do you understand by symbol table ? 3
6. What do you mean by lexical, syntactic and semantic errors ? How can these errors be detected and recovered ? Explain the various schemes for error detection and recovery. 15

Unit IV

7. What is loop optimization ? Explain various kinds of loop optimization with the help of suitable examples. **15**
8. (a) What is peephole optimization ? Explain in brief. **7.5**
- (b) What do you mean by data-flow analysis ? Explain using suitable examples. **7.5**

