

Roll No. ....

Total Pages : 03

**BT-7/M-20**

**37023**

**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**

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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
- $\text{stmt} \rightarrow \text{if } e \text{ then stmt}$   
 $\quad \quad \quad | \text{if } e \text{ then stmt else stmt}$   
 $\quad \quad \quad | \text{while } e \text{ do stmt}$   
 $\quad \quad \quad | \text{begin list end}$   
 $\quad \quad \quad | s$
- $\text{list} \rightarrow \text{list}; \text{stmt}$   
 $\quad \quad \quad | \text{stmt}$  7.5

### Unit III

5. (a) Give a syntax-directed definition to translate infix expression into postfix 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**