

[April-18]

[ECS-304]

**B.Tech. Degree Examination**

**Computer Science & Engineering**

**VI SEMESTER**

**COMPILER DESIGN**

(Effective from the admitted batch 2015–16)

**Time: 3 Hours**

**Max.Marks: 60**

---

**Instructions:** Each Unit carries 12 marks.

Answer all units choosing one question from each unit.

All parts of the unit must be answered in one place only.

Figures in the right hand margin indicate marks allotted.

---

**MODULE-I**

1. a) How to specify the tokens? Differentiate token, lexeme and pattern with suitable examples. And draw transition diagrams also 6  
b) What is the role of regular expression in lexical analysis? Explain with example 6

**OR**

2. What are the various phases of the compiler? Explain each phase in detail 12

**MODULE-II**

3. a) What is top down parsing? What are the problems in top down parsing? Explain each with suitable example 6  
b) What is shift reduce parser? Consider the following grammar:  
 $E \rightarrow E+E, E \rightarrow E * E, E \rightarrow (E), E \rightarrow id$  and show the shift-reduce parser action for the following string  $id*(id+id)$  6

**OR**

4. Construct the predictive parser for the following grammar: 12  
 $S \rightarrow (L) \mid a$   
 $L \rightarrow L, S \mid S$

### MODULE-III

5. Explain with a suitable example, the techniques used in YACC to resolve shift reduce and reduce-reduce conflicts 12

**OR**

6. a) Show that the following grammar is not SLR(1) 6  
 $S \rightarrow AaAb \mid BbBa$   
 $A \rightarrow \epsilon$   
 $B \rightarrow \epsilon$   
b) With neat sketch explain the structure of LR parser and the rules to compute LR item 6

### MODULE-IV

7. a) What is an intermediate code? Explain different types of intermediate codes forms and denote the subsequent statement in different forms: 6  
 $W = (A+b) - (C+D) + (A+B+C)$   
b) What changes are to be made to the parser stack to enable implementation of L-attributed SDD during LL parsing? Explain using an example 6

**OR**

8. a) Write the syntax of Switch statement. Explain Syntax Directed Translation of Switch Statement 6  
b) Using the SDD, translate and also draw the interpreted parse tree for the succeeding declaration  $z: x[i][j] + y[i][j]$  6

### MODULE-V

9. a) Write a short note on Peephole optimization 6  
b) Explain in brief 6  
i) Constant folding  
ii) Loop unrolling  
iii) Strength reduction

**OR**

10. a) Explain available expressions with suitable example 6  
b) Write a note on issues in code generation 6