

B.E. Computer Science & Engineering (Model Curriculum) Semester-VI
TEE201CS - Compiler Design

P. Pages : 2

Time : Three Hours



GUG/W/24/13821

Max. Marks : 80

- Notes :
1. All questions are compulsory.
 2. All questions carry equal marks.
 3. Assume suitable data wherever necessary.

1. a) Define Compiler? State various phases of Compiler and describe in detail. 8
- b) Explain the concept of bootstrapping with suitable example. Also give the advantages of Compiler. 8

OR

2. a) Explain four software tools that are used in Compiler Construction. 8
- b) Translate the following expression into various phases of Compiler. 8
- $a := b * c / a + d$
3. a) What is recursive descent parser? Construct recursive descent parser of the following grammar. 8
- $E \rightarrow E + T / T$
- $T \rightarrow TF / F$
- $F \rightarrow f / a / b$
- b) Write the rule to eliminate left recursion in a grammar prepare and eliminate the left recursion for the grammar- 8
- $S \rightarrow Aa / b$
- $A \rightarrow Ac / Sd / E$

OR

4. a) Analyze the following grammar is a LR(1) grammar and construct LALR parsing table 8
- $S \rightarrow Aa \mid bAc \mid dC \mid bda$
- $A \rightarrow d$
- $C \rightarrow a$
- b) Describe the concept of Predictive parsing and shift reduce parsing. 8

5. a) Discuss S-attributes and L-attributes with respect to SDD (Syntax Directed Definition). 8
- b) Write annotated parse tree for expression $5+4*3n$ where grammar is- 8
- $$L \rightarrow En$$
- $$E \rightarrow E + T / F$$
- $$T \rightarrow t * F / F$$
- $$f \rightarrow (E) / \text{digit}$$

OR

6. a) Explain detail specifications of type checker. 8
- b) What are different storage allocation strategies. 8
7. a) Explain various machine independent code optimization. 8
- b) Write short notes on Peephole optimization. 8

OR

8. a) Translate the expression into quadruples, triple, indirect triple. 8
- i) $-(a + b) * (c + a) * (a + b + c)$
- ii) $A = b * -c + b * -c$
- b) Write short note on polish notation. 8
9. a) Describe the concepts of basic blocks and flow graphs. 8
- b) Explain how local common subexpressions can be eliminated using DAG with suitable example. 8

OR

10. a) Generalize the process of optimization of basic blocks. Give an example. 8
- b) Evaluate the minimum cost instruction sequence for a statement 8
- $$A = b + c * d + e - 34$$
