



R18 Regulation

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)

Subject code:2P6EA

## B.Tech VI Semester Regular/Supplementary Examinations, June 2022

### COMPILER DESIGN

(COMPUTER SCIENCE & ENGINEERING)

Maximum Marks: 70

Date: 20.06.2022 Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
  2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
  3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
  4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks

(10x2M=20 Marks)

- 1 Compare phase with a pass
- 2 Differentiate between token and lexeme
- 3 Give the Role of syntax analyzer
- 4 Mention the features of parser generators.
- 5 Write down the SDD of a simple calculator.
- 6 Construct the syntax tree for the following assignment statement:  $a:=b*-c+b*-c$
- 7 How to reduce fragmentation in heap memory?
- 8 What is the purpose of next use information in code generation?
- 9 Differentiate constant propagation and variable propagation
- 10 What is machine independent optimization?

Part-B

Answer All the following questions.

(5X10M=50Marks)

- 11 What are various phases of a compiler? Explain the functions of each phase with its input and output for the example statement  $A = B + C * D / F$ .  
OR  
10m
- 12 a. Explain input buffering strategy used in lexical analysis phase. 5m  
b. Construct the minimized DFA for the regular expression :  $(0+1)^*(0+1)$  10 5m
- 13 a. What is ambiguous grammar? Eliminate ambiguities for the grammar:  
a.  $E \rightarrow E + E | E * E | (E) | id$  6m  
b. Discuss the problems in top-down parsers. How they are overcome? 4m  
OR
- 14 a. What are LR parsers? Give their advantages. Explain characteristics of different types of LR parsers. 5m  
b. Consider the following grammar: 5m  
 $E \rightarrow E + E$   
 $E \rightarrow E * E$   
 $E \rightarrow (E)$   
 $E \rightarrow ID$   
Using the above grammar, for input string  $x+y*z$  show the stack implementation for shift reduce parsing.

- 15 a. List different types of type checking. Find the type expression for the statements: 5m  
 int a,b,sum  
 a= func(10,20);
- b. Compare S-attributed definitions with that of L- attributed definitions. 5m
- OR
- 16 a. Write the quadruples, triples and indirect triples of  $(a+b) * (c+d)$  5m  
 b. Develop a SDD for functional procedures with pass by reference type parameter passing mechanism. 5m
- 17 a. Why dynamic storage allocation strategy is particularly amenable to the run-time storage requirements of block structured languages? 5m  
 b. Briefly explain various issues in the design of a code generator. 5m
- OR
- 18 a. What is Peephole optimization? Explain with examples. 5m  
 b. List out the primary structure preserving transformations on basic block 5m
- 19 a. What are the optimization techniques applied on procedure calls? Explain with an example. 6m  
 b. Describe live variable analysis with suitable example. Why is it required? 4m
- OR
- 20 a. Briefly explain about various principle sources of optimization. 5m  
 b. A flow graph is useful for understanding code generation language? Justify your answer with an example 5m