

Reg. No.

Question Paper Code

11529

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV/DEC 2022

Sixth Semester

Computer Science and Engineering

CS8602 - COMPILER DESIGN

(Regulations 2017)

Duration: 3 Hours

Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

- | | <i>Marks,
K-Level, CO</i> |
|--|-------------------------------|
| 1. Write about the Frontend Backend model of a compiler. | 2,K2,CO1 |
| 2. Distinguish between compiler and Interpreter. | 2,K2,CO1 |
| 3. Define tokens, patterns and lexemes. | 2,K1,CO2 |
| 4. Mention the issues in lexical analyzer. | 2,K2,CO2 |
| 5. List the differences between Top down and Bottom up parser. | 2,K2,CO3 |
| 6. Draw syntax tree for the expression $a=b*-c + b*-c$. | 2,K2,CO3 |
| 7. Write the properties of intermediate language. | 2,K2,CO4 |
| 8. Define three address codes. | 2,K1,CO4 |
| 9. Define Basic Block and Flow graph. | 2,K1,CO5 |
| 10. Give the fields in an Activation record. | 2,K2,CO5 |

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11. a) Describe the various phases of compiler and trace it with the program segment (position: = initial + rate * 60). 13,K2,CO1
- OR**
- b) (i) List the cousins of a Compiler. Explain them in detail. 7,K2,CO1
(ii) Explain the need for grouping of phases of the compiler. 6,K2,CO1
12. a) (i) Discuss input buffering techniques in detail. 7,K2,CO2
(ii) Draw the transition diagram for relational operators and unsigned numbers. 6,K2,CO2
- OR**
- b) Explain with examples how different tokens are specified and recognized during a compilation process. 13,K2,CO2

13. a) (i) Give the predictive parser table for the following grammar. 8,K2,CO3

$S \rightarrow (L) \mid a \quad L \rightarrow L, S \mid S$

(ii) Parse the string (a, (a, a)). 5,K2,CO3

OR

b) Define a shift-reduce parser. Explain in detail the conflicts that may occur during shift reduce parsing with suitable example. 13,K2,CO3

14. a) Illustrate in detail about the various forms of three address instruction with suitable examples. 13,K3,CO4

OR

b) Explain in detail about the specification of a simple type checker. 13,K2,CO4

15. a) Explain in detail about the various issues in code generation phase of a compiler with examples. 13,K2,CO5

OR

b) (i) Explain the storage organization memory in the perspective of a compiler writer with a neat diagram. 8,K2,CO5

(ii) Compare static versus dynamic memory allocation. 5,K2,CO5

PART - C (1 × 15 = 15 Marks)

16. a) Explain and apply the principal sources of optimization techniques for the given three address codes and write the optimized code. 15,K2,CO6

(1) $i := m-1$	(16) $t_7 := 4*i$
(2) $j := n$	(17) $t_8 := 4*j$
(3) $t_1 := 4*n$	(18) $t_9 := a[t_8]$
(4) $v := a[t_1]$	(19) $a[t_7] := t_9$
(5) $i := i+1$	(20) $t_{10} := 4*j$
(6) $t_2 := 4*i$	(21) $a[t_{10}] := x$
(7) $t_3 := a[t_2]$	(22) $\text{goto } (5)$
(8) $\text{if } t_3 < v \text{ goto } (5)$	(23) $t_{11} := 4*i$
(9) $j := j-1$	(24) $x := a[t_{11}]$
(10) $t_4 := 4*j$	(25) $t_{12} := 4*i$
(11) $t_5 := a[t_4]$	(26) $t_{13} := 4*n$
(12) $\text{if } t_5 > v \text{ goto } (9)$	(27) $t_{14} := a[t_{13}]$
(13) $\text{if } i >= j \text{ goto } (23)$	(28) $a[t_{12}] := t_{14}$
(14) $t_6 := 4*i$	(29) $t_{15} := 4*n$
(15) $x := a[t_6]$	(30) $a[t_{15}] := x$

OR

b) Write about Data Flow Analysis and Control Flow Analysis of structural programs. 15,K2,CO6