

Reg.No.:

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VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 50037

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – JAN. 2026
Sixth Semester
Computer Science and Engineering
U19CS626 - COMPILER DESIGN
(Regulation 2019)

Time: Three Hours

Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Differentiate compiler with interpreter.	2	K2	CO1
2.	Identify analysis and synthesis parts in phases of compiler.	2	K1	CO1
3.	State the issues in lexical analysis.	2	K1	CO2
4.	Construct parse tree for $a^+b^*(a b)^*ab\#$.	2	K2	CO2
5.	Write the algorithm for FIRST and FOLLOW.	2	K1	CO3
6.	Define ambiguous grammar.	2	K1	CO3
7.	Draw the diagram of the general activation record and give the purpose of any two fields.	2	K2	CO4
8.	Give example for synthesized attribute and inherited attribute.	2	K1	CO4
9.	How would you represent the following equation using DAG? $a:=b*c+b*-c.$	2	K2	CO5
10.	Define constant folding.	2	K1	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.	Questions	Marks	KL	CO
11. a)	Describe the various phases of compiler and trace the program segment $a:=b+c*4$ for all phases.	13	K3	CO1
	(OR)			
b) i.	Write short notes on compiler construction tools.	7	K2	CO1
ii.	Describe the errors encountered in different phases of compiler.	6		
12. a) i.	Construct the minimized DFA for the regular expression: $(0+1)^*(0+1)10$.	8	K3	CO2
ii.	Draw the transaction diagram to represent relational operator.	5		
	(OR)			
b)	Solve the given regular expression $(a/b)^* abb (a/b)^*$ into NFA using Thompson construction and then to minimized DFA.	13	K3	CO2
13. a) i.	Show that the following grammar $S \rightarrow AaAb \mid BbBa$ $A \rightarrow \epsilon$ $B \rightarrow \epsilon$ is LL(1).	7	K4	CO3
ii.	Construct Stack implementation of shift reduce parsing for the grammar and the input string $(a,(a,a))$ $S \rightarrow (L) \mid a$ $L \rightarrow L,S \mid S$	6	K4	
	(OR)			
b)	Check whether the grammar is LALR(1) but not SLR(1) $S \rightarrow Aa/bAc/dc/bda \quad A \rightarrow d$.	13	K4	CO3
14. a)	Discuss the various storage allocation strategies in detail.	13	K3	CO4
	(OR)			
b)	Construct a syntax directed definition for constructing a syntax tree for assignment statements. $S \rightarrow id: = E$ $E \rightarrow E1 + E2$ $E \rightarrow E1 * E2$ $E \rightarrow - E1$ $E \rightarrow (E1)$ $E \rightarrow id$	13	K4	CO4

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|--------|-----|--|---|----|-----|
| 15. a) | i. | Explain briefly about peephole optimization with examples. | 8 | K3 | CO5 |
| | ii. | Differentiate between synthesized translation and inherited translation. | 5 | | |

(OR)

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|----|-----|---|---|----|-----|
| b) | i. | What are the issues in the design of a code generator? Explain in detail. | 6 | K3 | CO5 |
| | ii. | Define basic block. Write an algorithm to partition a sequence of three-address statements into basic blocks. | 7 | | |

PART – C

(1 x 15 = 15Marks)

- | Q.No. | Questions | Marks | KL | CO |
|--------|---|-------|----|-----|
| 16. a) | Translate the expression $(a+b)*(c+d)+(a+b+c)$ into Syntax tree, Three address code, Quadruples, Triples, Indirect Triples. | 15 | K4 | CO4 |

(OR)

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|----|-----|---|----|----|-----|
| b) | i. | Explain in detail about optimization of basic blocks. | 5 | K3 | CO5 |
| | ii. | Construct the DAG for the following Basic block & explain it. | 10 | | |
| | a. | $t1 := 4 * i$ | | | |
| | b. | $t2 := a[t1]$ | | | |
| | c. | $t3 := 4 * i$ | | | |
| | d. | $t4 := b[t3]$ | | | |
| | e. | $t5 := t2 * t4$ | | | |
| | f. | $t6 := \text{Prod} + t5$ | | | |
| | g. | $\text{Prod} := t6$ | | | |
| | h. | $t7 := i + 1$ | | | |
| | i. | $i := t7$ | | | |
| | j. | if $i \leq 20$ goto (1) | | | |