

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: 50011

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – NOV. / DEC. 2025

Fifth Semester

Computer Science and Engineering

U23CS513 - COMPILER DESIGN

(Regulation 2023)

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.	Compare and Contrast between Compiler and Interpreter.	2	K2	CO1
2.	State the need of linker and loader in a computer system.	2	K1	CO1
3.	Differentiate among the terms tokens, patterns, and lexeme.	2	K2	CO2
4.	List the utility of regular expression in Lexical Analyzer phase.	2	K2	CO2
5.	Define Parser.	2	K1	CO3
6.	Define the goal of Error Handler.	2	K1	CO3
7.	Differentiate between synthesized and inherited attributes.	2	K2	CO4
8.	State the purpose of bottom-up evaluation of S-attributed definitions.	2	K2	CO4
9.	State the purpose of global data flow analysis.	2	K2	CO5
10.	Mention the role of live variable analysis.	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

- | Q.No. | Questions | Marks | KL | CO |
|--------|--|-------|----|-----|
| 11. a) | What is Compiler? Design the Analysis and Synthesis Model of Compiler. Write down the five properties of each phase of compiler. | 13 | K2 | CO1 |

(OR)

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|--------|--|----|----|-----|
| b) | What is translator? Write down the steps to execute a program with the help of a suitable example. Explain about Language Processor in compiler Design. | 13 | K1 | CO1 |
| 12. a) | Write the algorithm to convert Non-Deterministic Finite Automata (NFA) into minimized Deterministic Finite Automata (DFA). Convert the given NFA to minimized DFA: | 13 | K3 | CO2 |

Input/ State	0	1
→ Q ₀	{Q ₀ , Q ₁ }	Q ₀
Q ₁	Q ₂	Q ₁
Q ₂	Q ₃	Q ₃
Q ₃ (Final State)	-	Q ₂

(OR)

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|--------|---|----|----|-----|
| b) | Briefly discuss about the Role, design and specification of Lexical Analyzer with a suitable example. | 13 | K2 | CO2 |
| 13. a) | Explain the parsing techniques with a hierarchical diagram. What are the problems associated with Top-Down Parsing? Consider the following Grammar:
A → ABd Aa a
B → Be b
Remove left recursion. | 13 | K2 | CO3 |

(OR)

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|----|---|----|----|-----|
| b) | Write the comparison among SLR Parser, LALR parser and Canonical LR Parser. Show the following grammar
S → Aa bAc Bc bBa
A → d
B → d
Is LR (1) but not LALR(1). | 13 | K3 | CO3 |
|----|---|----|----|-----|

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| 14. a) | Discuss about the run time storage management of a code generator in detail. | 13 | K3 | CO4 |
|--------|--|----|----|-----|

(OR)

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|----|--|----|----|-----|
| b) | Write the definition of symbol table and procedure to store the names in symbol table. Describe the data structures with time complexity used in symbol table. | 13 | K2 | CO4 |
|----|--|----|----|-----|

15. a) Explain the simple code generator and generate target code sequence for the following statement. Also give instruction cost of computation.
 $d := (a - b) + (a - c) + (a - c)$
- (OR)
- b) Explain optimization techniques on Basic Blocks with simple examples. Consider the following program code:
 $Prod = 0;$
 $I = 1;$
Do{
 $Prod = prod + a[i] * b[i];$
 $I = i + 1;$
}
while ($i \leq 10$);
- Partition in into basic blocks
 - Construct the flow graph
 - Apply loop optimization methods and give the optimized computation cost.

PART – C

(1 x 15 = 15 Marks)

Q.No.	Questions	Marks	KL	CO
16. a)	Name and explain various types of compiler generation tools used in different phases of compiler.	15	K2	CO1
(OR)				
b)	Perform Shift Reduce Parsing for the input string using the grammar. $S \rightarrow (L)a$ $L \rightarrow L, S S$ a) $(a, (a, a))$ b) (a, a)	15	K3	CO3