Reg.No.:												

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

Question Paper Code: 50029

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – NOV. / DEC. 2024
Sixth Semester
Computer Science and Engineering
U19CS626 – COMPILER DESIGN
(Common to Information technology)
(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.	Define sentinel and write its usage.	2	K2	CO1
2.	Identify analysis and synthesis parts in phases of compiler.	2	K2	CO1
3.	Differentiate pattern, lexeme and tokens.	2	K1	CO2
4.	Construct parse tree for $a^+b^*(a\|b)^*ab\#$.	2	K3	CO2
5.	Define ambiguous grammar.	2	K1	CO3
6.	Give procedure to find FIRST and FOLLOW elements.	2	K2	CO3
7.	Enlist the storage allocation strategies used in run time environment.	2	K2	CO4
8.	Give example for synthesized attribute and inherited attribute.	2	K1	CO4
9.	Write the various applications of DAG.	2	K2	CO5
10.	Define constant folding.	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.			Questions	Marks	KL	CO
11.	a)		Discuss the phases of a compiler indicating the inputs and outputs of each phase in translating the statement "amount = principle + rate * 36.0 ".	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)		Convert the regular expression abb(a|b)* to DFA using direct method and minimize it.	13	K3	CO2
			(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.	Evaluate predictive parsing table and parse the string id+id*id. E→E+T | T T→T*F | F F→(E) | id	7	K4	CO3
		ii.	Construct Stack implementation of shift reduce parsing for the grammar and the input string id1+id2*id3 E->E+E E->E*E E->(E) E->id	6		
			(OR)			
	b)		Check whether the grammer is LALR(1) but not SLR(1) S-->Aa/bAc/dc/bda A-->d.	13	K4	CO3
14.	a)		Discuss in detail about different storage allocation strategies.	13	K3	CO4
			(OR)			
	b)		Construct a syntax directed definition for constructing a syntax tree for assignment statements. S -> id: = E E -> E1 + E2 E -> E1 * E2 E -> - E1 E -> (E1) E -> id	13	K2	CO4

15.	a)	i.	Explain principal sources of optimization with examples	8	K3	CO5
		ii.	Differentiate between synthesized translation and inherited translation.	5		
			(OR)			
	b)	i.	What are the issues in design of a code generator? Explain in detail.	6	K2	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)			
	b)	i.	Explain in detail about optimization of basic blocks.	5	K3	CO5
		ii.	Construct the DAG for the following Basic block & explain it. 1. t1: = 4 * i 2. t2:= a [t1] 3. t3: = 4 * i 4. t4:= b [t3] 5. t5:=t2*t4 6. t6:=Prod+t5 7. Prod:=t6 8. t7:=i+1 9. i:= t7 10. if i<= 20 goto (1)	10		