VIT
Vellore Institute of Technology
(Deemed to be University under Section 3 of UGC Act, 1956)

School of Computer Science and Engineering

Fall Semester 2024-25

CAT I

SLOT: C2+TC2

Programme Name & Branch: B.Tech

Course Name & Code: BCSE307L – Compiler Design

Class Number (s): VL2024250101546, VL2024250101550, VL2024250101556, VL2024250101591, VL2024250101607, VL2024250101617, VL2024250101627, VL2024250101635, VL2024250101644, VL2024250101655, VL2024250101665, VL2024250101671, VL2024250101674, VL2024250101679, VL2024250101688, VL2024250101729, VL2024250101738, VL2024250102054, VL2024250108000

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Exam Duration: 90 Min. Maximum Marks: 50

ANSWER ALL THE QUESTIONS

Q. No.	Question	Max Marks
1.	Convert the regular expression **(a|b)*abb(a|b)*** into deterministic finite automata using direct method.	10

2.	a) Identify the lexemes that make up the tokens in the following program and give reasonable attributes values for the tokens.
	
	`int main()`
	`{ //To calculate the prime number`
	`for (j = 2; j <= num / 2; j++) {`
	`if ((num % j) == 0) {`
	`flag = 1;`
	`break;`
	`}`
	`}`
		5+5

	`if (flag == 0)`
	`printf("%d is a prime number \n", num);`
	`else`
	`printf("%d is not a prime number \n", num);`
	`}`
	
	b) Construct the operator precedence relation table for the following CFG where S is the starting symbol.
	
	S → SAS | (S) | S
	A→ ↑ | *
	
	Parse the string **a↑b*c** using the relation table constructed.	

3.	a. Illustrate all phases of compilation and generate assembly language code for the ***computation of simple interest.*** b. Construct a symbol table for the above case.	10
4.	In the following context-free grammar, the symbols a, b, c and d are terminals and P is the initial symbol. **P → a | b P c P d |b Q d** **Q → P | Q P** i. Explain briefly why this grammar is not LL(1). ii. Convert this grammar to an equivalent that is LL(1). iii. For the grammar of the previous subtask, construct the complete LL(1) parsing table. iv. Show all the steps required to parse the input string: **bbacadabadd**	10
5.	a) Write the Recursive Procedure based Top-Down parsing for the following CFG. S → AB A → aA | bB | Ac | Ab B → b | aB b) Check whether the string w=acadb is parsed by the above CFG.	10