

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY-GURUJADA
VIZINAGARAM**

III B. Tech I Semester Regular Examinations November -2025

COMPILER DESIGN

(CSE)

Time: 3 hours

Max. Marks: 70

The Question paper consists of Part A & Part B.

Part A is compulsory, Answer all questions. Part B Answers any one question from each unit.

1		PART-A	(20Marks)
	a)	Define Cross Compiler with suitable example	[2]
	b)	Write regular expression over alphabet {a, b, c} containing at least one 'a' and at least one 'b'	[2]
	c)	How to Eliminate immediate left recursion	[2]
	d)	What are the actions performed by Shift Reduce Parser?	[2]
	e)	What are s – attributes and l – attributes	[2]
	f)	Define Type Checking.	[2]
	g)	What are the advantages of stack storage allocation strategy?	[2]
	h)	Define is reduction in strength with suitable example	[2]
	i)	What is machine dependent code optimization	[2]
	j)	List out the common issues in the design of code generator	[2]
		PART-B	(50Marks)
		Question from Unit – I	
2	a)	Explain the various phases of a compiler in detail and write down the output for the following expression after each phase a: =b*c+d	[5]
	b)	Explain about the Properties of RegularExpressions	[5]
		(OR)	
3	a)	List the differences between a compiler and an interpreter	[5]
	b)	Construct Finite Automata for the regular Expression following a) $1(01+10)^*00$ b) $(0+1)^*(00+11)1$	[5]
		Question from Unit – II	
4	a)	Examine whether the given grammar is supported by LL(1) parser ? $E \rightarrow E+T/T$ $T \rightarrow T*F/F$ $F \rightarrow F/a/b$	[5]
	b)	Describe Ambiguous Grammer? Check the below grammer $R \rightarrow R T$ $T \rightarrow \epsilon$ is an ambiguous grammar or not.	[5]
		(OR)	
5	a)	Explain the steps to compute FIRST and FOLLOW with an example.	[5]

	b)	Consider the grammar. $E \rightarrow E + T / T$ $T \rightarrow T * F / F$ $F \rightarrow (E) / id$ Construct CLR parsing table for the above grammar. Give the moves of the CLR parser on $id * id + id$.	[5]
		Question from Unit – III	
6	a)	Give syntax directed translation scheme for simple Type Checker	[5]
	b)	Translate the following expression: $(a + b) * (c + d) + (a + b + c)$ into i) Quadruples ii) Triples ii) Indirect triples	[5]
		(OR)	
7	a)	List the differences between Synthesized attributes & Inherited Attributes	[5]
	b)	Describe in detail the syntax directed translation of case statements	[5]
		Question from Unit – IV	
8	a)	Explain the process of stack allocation in run-time environments.	[5]
	b)	Illustrate loop optimization techniques with suitable example	[5]
		(OR)	
9	a)	Describe the structure and purpose of an activation record in a run-time environment	[5]
	b)	Explain in brief about optimization of basic blocks	[5]
		Question from Unit – V	
10	a)	Give an example to show how DAG is used for register allocation..	[5]
	b)	Explain various methods to handle peephole optimization	[5]
		(OR)	
11	a)	Elaborate Code Generation Algorithm	[5]
	b)	Generate the machine code for the expression $d := (a-b) + (a-c) + (a-c)$	[5]
