

**PRAGATI ENGINEERING COLLEGE: SURAMPALEM
(AUTONOMOUS)**

III B.Tech I Semester Supplementary Examinations, May-2024

**AUTOMATA THEORY AND COMPILER DESIGN
(Common to CSE(AI&ML), CSE(AI) and CSE(DS))**

Time: 3 hours

Max. Marks: 70

**Answer ONE Question from each Unit
All Questions Carry Equal Marks**

Q. No.	Questions			BTL	CO	Marks	
UNIT – I							
1.	a)	Construct a DFA accepting the set of all strings having the substring abb over the alphabet {a,b}.			K3	CO1	7M
	b)	Convert the given NFA to DFA.			K3	CO1	7M
		δ	0	1			
		$\rightarrow q0$	$q0$	$q0, q1$			
		$q1$	$q2$	$q2$			
$*q2$	ϕ	ϕ					
OR							
2.	a)	Convert the given regular expression $abb(a+b)^*$ to epsilon NFA			K3	CO1	7M
	b)	Briefly explain the application of finite automata to lexical analysis			K2	CO1	7M
UNIT – II							
3.	a)	Explain Bottom Up parsing with example.			K2	CO2	7M
	b)	Construct a LALR pare table for the given grammar $S' \rightarrow S$ $S \rightarrow CC$ $C \rightarrow c \mid C \mid d$			K3	CO2	7M
OR							
4.	a)	Define CFG. Construct a parse tree for the string $aa+a^*$ for the grammar $S \rightarrow SS+ \mid SS* \mid a$ Check whether the grammar is ambiguous or not.			K3	CO2	7M
	b)	Explain the parser generator YACC.			K2	CO2	7M
UNIT – III							
5.	a)	Explain S-attributed and L-attributed SDD's.			K2	CO3	7M
	b)	Explain the evaluation order of SDD's.			K2	CO3	7M
OR							
6.	a)	Construct the annotated parse tree for $3*5+4n$ for the given grammar $L \rightarrow E \mid n$ $E \rightarrow E_1 + T$ $E \rightarrow T$ $T \rightarrow T_1 * F$ $T \rightarrow F$ $F \rightarrow (E)$ $F \rightarrow \text{digit}$			K3	CO3	7M

	b)	Discuss Type checking, Type Conversion and equivalence of type expressions.	K2	CO3	7M
UNIT – IV					
7.	a)	Explain the storage allocation strategies.	K2	CO4	7M
	b)	Explain the optimization of Basic Blocks.	K2	CO4	7M
OR					
8.	a)	Explain the data flow analysis of flow graph.	K2	CO4	7M
	b)	Explain Peephole Optimization.	K2	CO4	7M
UNIT – V					
9.	a)	Explain register allocation and assignment in Code generation.	K2	CO5	7M
	b)	Discuss the issues involved in Code generation.	K2	CO5	7M
OR					
10.	a)	Construct a DAG for the basic block $d = b * c$ $e = a + b$ $b = b * c$ $a = e - d$	K3	CO5	7M
	b)	Explain the dead code elimination with example.	K2	CO5	7M