RAMAIAH Institute of Technology

Dept. of Computer Science and Engineering (AI & ML) & Computer Science and Engineering (Cyber Security)

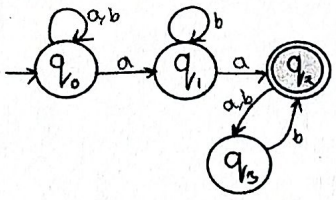
Programme: B E – Computer Science and Engineering (AI&ML) & Computer Science and Engineering (Cyber Security)

Internal Assessment – II

TERM : 03-10-2024 to 25-01-2025	COURSE NAME: AUTOMATA THEORY AND COMPILER DESIGN
DATE : 20-01-2025 TIME: 11.00 AM – 12.00 PM	COURSE CODE : CI53/CY53
MAX MARKS: **30**	PORTIONS : L28-L52

Mobile Phones are banned

Instructions to Candidates: **Answer any TWO full questions.** Marks: **15x2=30**

Q. NO	Questions	Blooms Levels (L1 to L6)*	CO	Marks
1.a	Construct DFA, which accept all the string over alphabets ∑ {0,1} where each string contains "00".	L1	CO 1	3M
b	Construct DAG and obtain the three address code and value number method for the given arithmetic expression **a= a + a + a/b + a/b * (c*d)**	L2	CO 4	6M
c	Illustrate the Semantic Rules with Controlled Side Effects by generating an SDD for basic array type declarations. Grammar: **T→B id C** **B→int | float** **C→[num] C | ϵ** **Draw the Annotated Parse tree and Dependency Graph for the declaration statement : float a,b,c**	L2	CO 5	6M
2.a	Explain the rules for turning an L-attributed SDD to SDT. Convert the SDD given below to SDT.	L1	CO 5	4M
b	Convert the given NFA to DFA and Minimize the obtained DFA. 	L2	CO 1	6M
c	Design L- Attributed Definition for converting a Binary value to Decimal. Evaluate using the method **$101=1*2^2+0*2^1+1*2^0$** Consider the Production: **G:- B→N D** **D→N D | ε** **N→0 | 1** Construct the Annotated Parse tree for input string **"1101"**	L3	CO 5	5M
3.a	Translate the given arithmetic expression **a[i]=b*c-min (b, b*d)** into i. Three Address Code ii. Quadruple	L3	CO 4	5M
b	Explain the task of a code generator with suitable examples.	L3	CO 4	5M
c	Given a translation scheme **A->aaB {print(1)} | b {print(2);}** **B->Ac {print(3);}** What will be the final result when the input **"aaaabcc"** is getting evaluated? Show the translation of the input on the translation scheme given.	L2	CO 3	5M

Production | **Semantic Rules**

Production	Semantic Rules
D->B D^1	D.val= D^1.syn D^1.inh=B.val
D^1->B D_1^1	D_1^1.inh= D^1.inh*2+B.val D^1.syn= D_1^1.syn
D^1->ε	D^1.syn= D^1.inh
B->0	B.val=0
B->1	B.val=1

* **L1** – Remember, **L2** – Understand, **L3**- Apply, **L4**- Analyze, **L5**-Evaluate, **L6**-Create