Programme: B.E – CSE (AI&ML) and CSE (Cyber Security)

Internal Assessment – I

TERM: 03/10/2024 – 25/01/2025	**COURSE NAME:** Automata Theory and Compiler Design
DATE: 28/11/2024 **TIME:** 11:00am to 12:00pm	**COURSE CODE:** CI53/CY53
MAX MARKS: 30	**PORTIONS:** L1-L20
SEMESTER: 5th SEM	**SECTION:** A

Mobile Phones are banned

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

Q. NO	Questions	Blooms Levels	CO	Marks
1.a	The lexical analyzer uses the given patterns for recognizing three tokens, A, B, and C, over the alphabets a, b, c. The pattern specification of A,B and C are as follows, **A→ a?(b|c)*a** **B→ b?(a|c)*b &** **C→ c?(b|a)*c** The scanner outputs the token matching the longest possible prefix. If the scanner processes the string **"bbaacabc",** what will be the sequence of tokens it outputs?	L4	CO2	3
b	Explain the phases of a compiler by translating the given assignment statement.***(Assume all variables are of type int)*** **val=(a*a+b*b);**	L2	CO1	6
c	Design a Predictive Parsing Table for the Grammar given below. If not suitable for Predictive parser make necessary changes and construct predictive parsing table for the grammar given below. If LL (1), do parsing for the input **"caf$"** **G: S→ adB | Af** **B→ aS | baB | ε** **A→ caBA | ε**	L3	CO2	6
2.a	Construct CLR(1) set of items for the grammar given **G: S→xAy| zBy | xBe | zAe** **A→a** **B→a**	L3	CO2	5
b	Compute FIRST and FOLLOW of all Non-terminals for the grammar **G:** **i. S→ABC** **A→BS | b** **B→ bS | CA | ε** **C→ ε** ii. **S→AB | Bb|c** **A→Bd | ε** **B→d | e**	L3	CO3	6
c	**Answer the following questions** **i. For the expression grammar** **E→E*F | F+E | F** **F→F – | id** **Which of the given statement holds true. Justify your answer.** (A) + and – have same precedence (B) Precedence of * is higher + (C) Precedence of - is higher * (D) Precedence of + is higher *	L4	CO3	4

	ii. **Which of the following grammars are LL (1)? Justify your answer.** (A) S → aSa | bS | ε (B) S→ CC C→ cC | d (C) A → AA | (A) | ε			
3.a	"Assume that all our Transition diagrams are deterministic". Justify your answer for this statement. Construct transition diagram for operators &,!, | ,&&, ||.	**L4**	**CO1**	**(3+1 =4)**
b	Write regular expressions for i. Accepting the Course Code of all CSE (AI&ML) and CSE (Cyber Security) courses for semester 3, 4 and 5. ii. Accepting Email id for gmail/yahoo. iii. Accepting the classrooms/labs of CSE(AI&ML) and CSE(Cyber security) iv. Accepting the basic clauses of SQL.	**L3**	**CO1**	**4**
c	Construct LR(0) set of items for the following grammar. Design LR (0) parse table for the Grammar. Parse the input **"ba$"** **G: S→Aa** **A→BD** **B→b| ε** **D→d| ε**	**L3**	**CO2**	**7**

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