	Reg. No.:		
	Name :		

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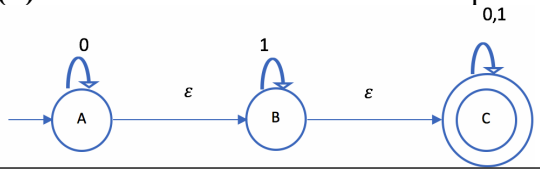
MID TERM EXAMINATIONS – November 2024

Programme	:	**B.Tech.**	Semester	:	**Interim 2024-25**
Course Title/ Course Code	:	**Theory of Computation and Compiler Design/ CSE2004**	Slot	:	**C11+C12+C13**
Time	:	**1 ½ hours**	Max. Marks	:	**50**

Answer all the Questions

Q. No.	Question Description	Marks
1	**(a)** Design a DFA to accept L = set of all strings w over alphabet {0, 1} such that numbers of 1's in w is 3 mod 4.	**5**
	(b) Build a NFA without ∈-moves equivalent to the following ∈-NFA. 	**5**
2	**(a)** Construct the DFA equivalent for the following regular expression: 1*00* + 010	**5**
	(b) A Lex program is given below – Regular Definitions None Transition Rules 1 { } /* actions are omitted here */ 100 { } 1^*0^+ { } Implement the Lex as DFA.	**5**
3	Consider the following grammar: $S \rightarrow 0B \mid 1A,$ $A \rightarrow 0 \mid 0S \mid 1AA,$ $B \rightarrow 1 \mid 1S \mid 0BB$ For the string 00110101, illustrate **(i)** the Left-Most Derivation (LMD), **(ii)** the Right-Most Derivation (RMD), and **(iii)** the Derivation Tree. Also prove that the given grammar is ambiguous.	**10**
4	**(a)** Build the grammar G' in Chomsky Normal Form (CNF) equivalent to the following grammar G: S→bA | aB, A→bAA | aS | a, B→aBB | bS | b	**5**
	(b) Construct a PDA accepting $\{a^n b^m c^n \mid n, m \geq 1\}$ by null store.	**5**
5	**(a)** Determine the grammar without left recursion equivalent to the following	**5**

	grammar: $X \rightarrow X+Y \mid X-Y \mid Y$ $Y \rightarrow Y*Z \mid Y/Z \mid Z$ $Z \rightarrow (X) \mid a$	
	(b) Do left factoring for the following grammar: $S \rightarrow AS \mid AbS \mid A \mid a$ $A \rightarrow aB \mid aBS \mid a$ $B \rightarrow bA \mid b$	**5**
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