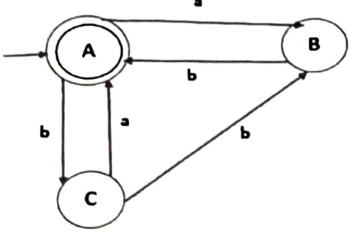


Programme Name & Branch : B.Tech. Information Technology
Course Code and Course Name : BITE306L and Theory of Computation
Faculty Name(s) : Dr. Kanchan Keisham
Class Number(s) : VL2025260503049
Date of Examination : 17-Mar-2026
Exam Duration : 90 minutes

Maximum Marks: 50

General instruction(s):

- Answer All Questions
- M - Max mark; CO - Course Outcome; BL - Blooms Taxonomy Level (1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyse, 5 - Evaluate, 6 - Create)
- Course Outcomes (Type the CO statements covered in this question paper. Use the CO number as per the syllabus copy)
C02 : Use and apply important properties of finite automaton to derive regular expressions from finite automation and vice versa.
C03 : Analyze the context free grammar to simplify, remove ambiguity and perform conversion.

Q. No	Question	M	CO	BL
1.	Convert the following Finite automata to Regular expression using state elimination method. 	10	C02	BL4
2.	Construct an equivalent right linear grammar for the given left linear grammar $S \rightarrow Aa \mid A$ $A \rightarrow Bb \mid Ba$ $B \rightarrow a$	10	C03	BL3
3.	a) Give regular expressions for the set L of strings in which every 0 is immediately followed by at least two 1's.	5	C02	BL3
	b) Prove that the following regular expressions are equivalent using regular expression identities $(0+11^*0)+(0+11^*0)(1+01^*0)^*(1+01^*0)=1^*(0(1+01^*0))^*$.	5		
4.	Analyze the following CFG and derive its equivalent Chomsky Normal Form (CNF). $S \rightarrow ASA \mid aB \mid b$ $A \rightarrow B \mid S \mid a$ $B \rightarrow bB \mid \epsilon$	10	C03	BL4
5.	a) Prove that the language $L = \{ a^n b^n \mid n \geq 0 \}$ is not regular using Pumping Lemma.	5	C02	BL2
	b) Find a regular expression for $L = \{ a^n b^m \mid n \geq 1, m \geq 1, (n+m) \text{ is odd} \}$.	5		