

YASHODA TECHNICAL CAMPUS, SATARA

An Autonomous Institute

FACULTY OF ENGINEERING

Department of Computer Science and Engineering

Question Bank (Mid Sem)

Subject: - Theory of Computation

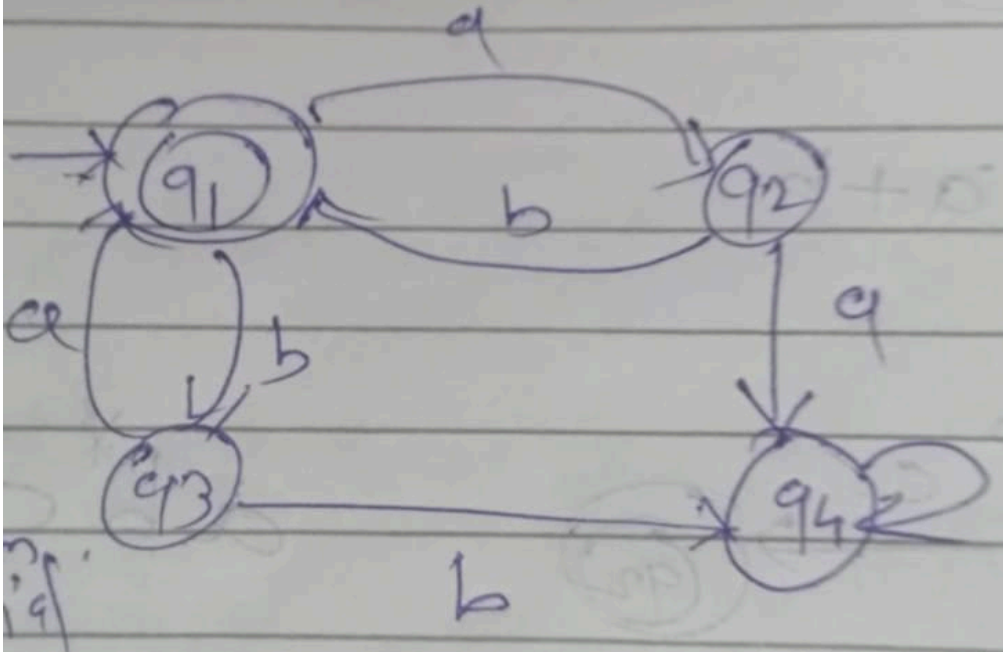
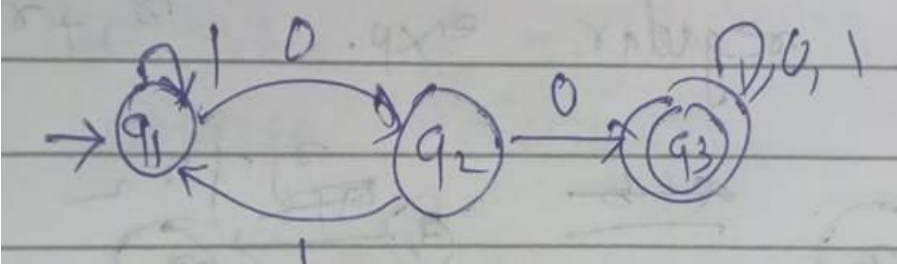
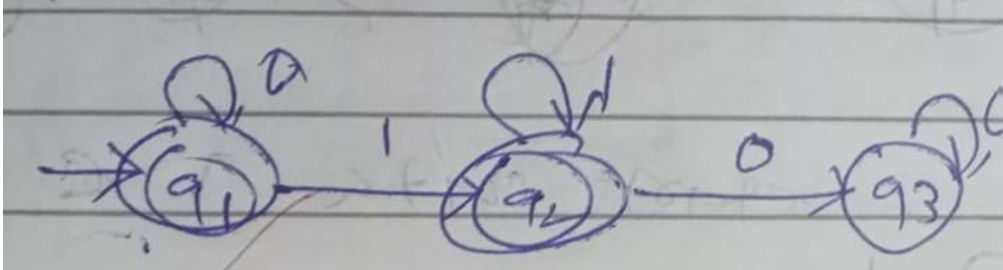
Class-TY CSE

AY- 2026-27

Sr. No.	Question	
1	Design the DFA for 4. String starts with “a” ends with “b” 5. Even number of a’s & Even number of b’s 6. Odd number of a’s & Even number of b’s 7. Even number of a’s & Odd number of b’s 8. Odd number of a’s & Odd number of b’s	
2	Construct the NFA for 1. String that ends with ‘a’. 2. String start with “a” 3. String contains substring 001 4. all language in which second last bit is 1.	
3	Differentiate between NFA & NFA with Epsilon	
5	Differentiate between Type-2 & Type-3 grammar.	
6	Solve given Automata to Regular expressions.	

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Mission of department: 1. To create ambience of academic excellence through state of art infrastructure. 2. To create student-centric pedagogy that will lead to employability. 3. To create a software engineering professional with knowledge of multidisciplinary fields, can provide innovative products & service to society. 4. To train and motivate the students for lifelong learning, employability, and entrepreneurship.

7	Prove the Arden's Theorem for converting finite automata into regular expression. Solve example given below 	
8	Solve example using Arden's Theorem. 	
9	 Solve example using Arden's Theorem.	

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10	Compute the leftmost derivation & rightmost derivation. Also find its LMD Tree & RMD Tree for CFG $E \rightarrow E * E / E - E / id$ String is $id - id * id$	
11	Compute the leftmost derivation & rightmost derivation tree for CFG $E \rightarrow E * E / E + E / a$ String is $a * b + a$	
12	Consider production of grammar $G = (N, T, P, S)$ $S \rightarrow S + S / S * S / a / b$ Compute a) Leftmost derivation Tree b) Rightmost derivation tree for the string “ $a + a * b$ ”	
13	Define the terms a) Leftmost derivation b) Rightmost derivation c) Parse tree d) Leftmost derivation tree e) Rightmost derivation tree f) Context free grammar g) Regular Grammar	
14	Discuss the left linear grammar & right linear grammar. Convert the right linear grammar into left linear grammar. $S \rightarrow bA$ $A \rightarrow aA / bB / b$ $B \rightarrow bA$	
15	Illustrate the regular grammar & the types of regular grammar. Convert the Left linear grammar into finite automata. $A \rightarrow Ba / Ab / b$ $B \rightarrow Ca / Bb$ $C \rightarrow Aa / Cb$	

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