

Sinhgad Technical Education Society's
 RMD Sinhgad School of Engineering, Warje, Pune-58
 Department of Computer Engineering
 A.Y. 2024-25 (Sem - I)

UNIT TEST: 1

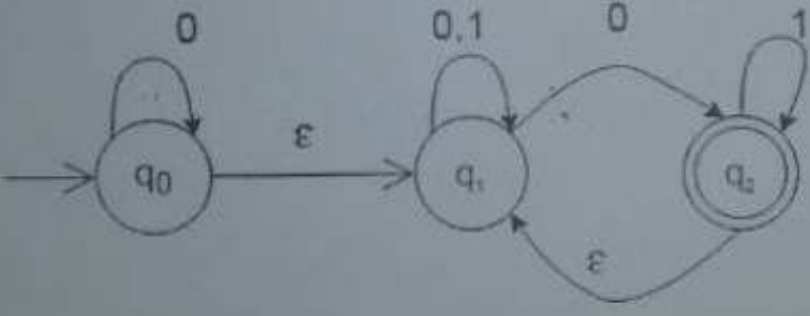
Class: TE
 SET: A

Subject: TOC
 Time: 1 Hr (10:00 am to 11:00am)

Date:
 Maximum Marks: 30

Instructions to Candidates:

1. Attempt Questions Q.1 OR Q.2, Q.3 OR Q.4
2. Neat diagrams must be drawn wherever necessary
3. Assume suitable data, if necessary

Q1)	a) Define the following terms with example. i) Alphabet ii) String iii) Language	3
	b) Construct DFA (Transition Diagram and Transition Table) over alphabet {a, b} for language : All strings starting with abb.	6
	c) Convert following epsilon NFA to NFA 	6
OR		
Q2)	a) Define the following terms with example. i) DFA ii) NFA iii) epsilon NFA	3
	b) Construct NFA (Transition Diagram and Transition Table) over {a,b} where every string starts and ends with different symbols.	6

e) Convert following Mealy Machine to Moore Machine

6

Present State	Next State			
	a=0		a=1	
	State	output	State	Output
→A	A	1	B	0
B	D	1	D	1
C	B	1	C	1
D	C	0	A	1

Q3)

a) Define closure properties of RL's in detail with example.

9

b) Prove the formula $(00^*1)^*1=1+0(0+10)^*11$

6

OR

Q4)

a) Prove Arden's Theorem

5

b) Using pumping lemma for regular sets, prove that the language, $L=\{a^n | n \text{ is a prime}\}$ is not regular

5

c) Construct DFA for the Regular Expression $(a+b)^*abb$

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