

Reg. No.:

Name :



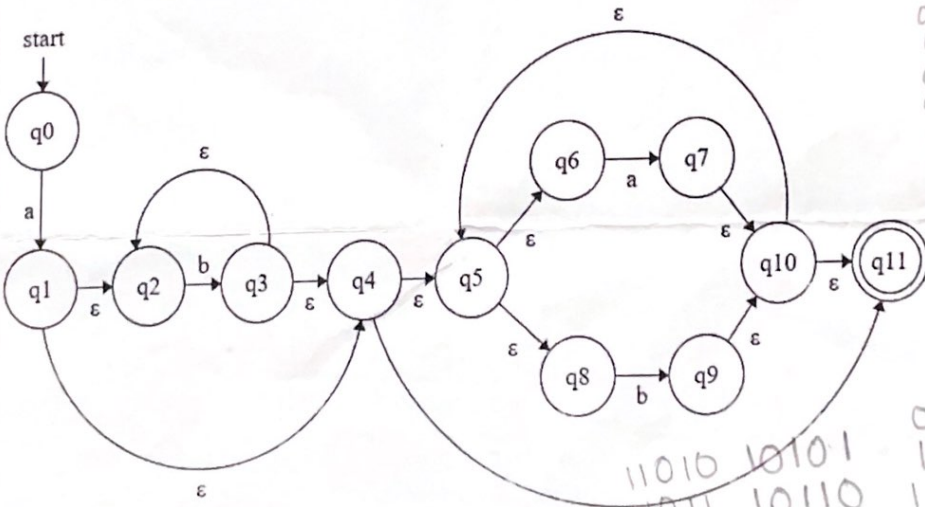
VIT

Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

Continuous Assessment Test I – September 2022

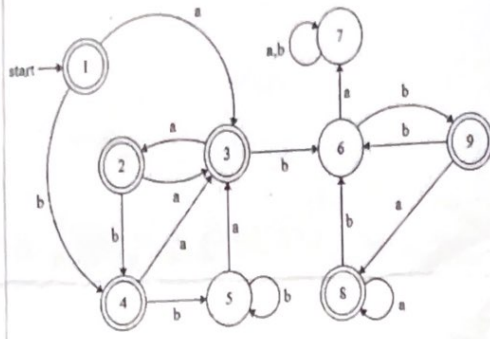
Programme	: B.Tech	Semester	: FS 2022-23
Course	: Theory of Computation	Code	: BCSE304L
Faculty	: Dr. Anita X, Dr. Jani Anbarasi L, Dr. Jothi R, Dr. Karmel A, Dr. Renjith P N, Dr. Sathyarajasekaran K,	Slot	: C1+TC1
		Class Nbr	: CH2022231001273 CH2022231001269 CH2022231001260 CH2022231001262 CH2022231001267 CH2022231001264
		Max. Marks	: 50
		Time	: 90 Minutes

Answer ALL the questions

Q.No.	Questions	Marks
1.	Construct the finite automaton for the language L, where $L = L1 + L2$ $L1 = \{w \mid w \in \{0,1\}^* \text{ containing binary strings that are multiples of 5 when interpreted in decimal}\}$ $L2 = \{w \mid w \in \{0,1\}^* \text{ containing strings that starts with 1 and ends with 101 with } w > 4\}$	10
2.	Convert the given ϵ -NFA into NFA without ϵ -moves. 	10

00000 ✓
0001 ✓
2010 ✓
0011 ✓
0100 ✓
0101 ✓
0110 ✓
0111 ✓
1000 ✓
1001 ✓
010 ✓
010 ✓
1100 ✓
1101 ✓
1110 ✓
0111 ✓
10000 ✓
10001 ✓
11010 ✓
11011 ✓
11011 ✓
11000 ✓
10011 ✓
11001 ✓
10100 ✓

3. Construct a minimized deterministic finite automaton(M1) for the automation(M) given below.



10

4. A bag contains balls of 3 different colours viz., red, blue and yellow. Create a deterministic finite automaton to check whether the balls picked from the bag is in the following order.

“The first three balls would be either red or blue followed by any number of yellow balls or one red ball alone and the collection ends with one red ball or two yellow balls.”

Construct finite automaton equivalent to the regular expressions given below.

- a) $(aa^*b)^* + ba^*$ [5M]
- b) $(0 \parallel 1(01^*0)^* 1)^*$ [5M]

8
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⇔⇔⇔

$\begin{matrix} 000 & 0 & 0 \\ RRR & Y & IR \\ BBB & IR & 2Y \end{matrix}$