

Vivekananda College of Engineering & Technology,Puttur

[A Unit of Vivekananda Vidyavardhaka Sangha Puttur ®]
 Affiliated to VTU, Belagavi & Approved by AICTE New Delhi

CRM08

Rev 1.10

CSE

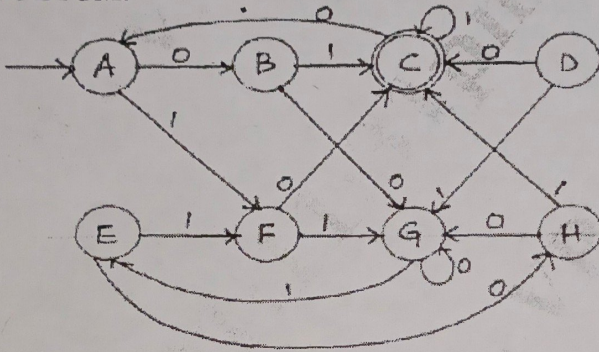
15/11/2022

CONTINUOUS INTERNAL EVALUATION- 1

Dept: CSE	Sem / Div: 5 th A and B	Sub: Automata Theory and Computability	S Code: 18CS54
Date: 22/11/2022	Time: 3:00 - 4:30 PM	Max Marks: 50	Elective: N
Note: Answer any 2 full questions, choosing one full question from each part.			

Q N	Questions	Marks	RBT	COs
PART A				
1 a	Discuss standard operations on Languages with example.	4	L2	CO1
b	Briefly explain hierarchy of languages with a diagram.	5	L2	CO1
c	For the following NDFSM, use ndfsmtoDFSM to construct an equivalent DFSM. Begin by showing the value of $\epsilon(q)$ for each state q .	8	L3	CO1
d	Minimize the following DFSM.	8	L3	CO1
OR				
2 a	Explain with example, i. Alphabet ii. Language iii. Functions on string	4	L2	CO1
b	Define a Moore Machine and a Mealy Machine. Give an example for each.	5	L2	CO1
c	Design a DFSM for the following languages. i. $L = \{ w \in \{a, b\}^* : \text{where } w \bmod 3 < w \bmod 2 \}$. Write configurations for "baabab" ii. $L = \{ w \in \{a, b\}^* : w \text{ contains an odd number of a's and an odd}$	8	L3	CO1

CONTINUOUS INTERNAL EVALUATION- 1

	number of b's}. Write the configurations for "aabbab"	8	L3	CO1
d	Design a NDFSM for the following languages: i. $L = \{w \in \{a,b\}^* : \text{The third character from the first is a}\}$ ii. $L = \{abab^n \mid n \geq 0\}$ or $\{aba^n \mid n \geq 0\}$			
PART B				
3 a	Minimize the DFSM. 	8	L3	CO1,2
b	Construct DFSM which accepts strings of 0's and 1's where the value of each string is represented as binary number and the string divisible by 5 is accepted	8	L3	CO1,2
c	Write Regular expressions for the following languages: i. $L = \{w \in \{0, 1\}^* : \text{every odd length string in } L \text{ begins with } 11\}$. ii. $L = \{w \in \{0-9\}^* : w \text{ represents the decimal encoding of an odd natural number without leading } 0\text{'s}\}$. iii. $L = \{w \in \{a, b\}^* : w \text{ contains exactly two occurrences of the substring } aa\}$.	9	L3	CO1,2
OR				
4 a	Define regular expression. Give example.	8	L2	CO1,2
b	Construct DFSM to strings of a's and b's which ends with ab or ba. Also write computation for baaaba and baabab	8	L3	CO1,2
c	Write Regular expressions for the following languages: i. $L = \{w \in \{a, b\}^* : w \text{ has both } aa \text{ and } bb \text{ as substrings}\}$. ii. $L = \{w : w \bmod 3 = 0 \text{ where } w \in (a, b)^*\}$ iii. $L = \{a^n b^m \mid n \geq 4, m \leq 3\}$	9	L3	CO1,2