

Internal Assessment Test 5 – Feb 2022

Sub:	Automata Theory & Computability					Sub Code:	18CS54	Branch:	ISE		
Date:	05/01/2022	Duration:	90 min's	Max Marks:	50	Sem/Sec:	V A, B & C			OBE	
Answer any FIVE FULL Questions								MARKS	CO	RBT	
1	(a) Write down the formal definition of Nondeterministic finite automata (NFA). Define extended transition function and L(M) where L is the language and M is the machine. (b) Define Epsilon closure of Nondeterministic finite automata with epsilon/null move. (NFA - epsilon).					[6 + 4 =10]	CO1	L2			
2	(a) Consider the following NFA and describe the processing of the input string w = abbab. Show all the steps. (b) Convert the following NFA to DFA (Deterministic finite automata). q _s is the start state, q ₂ is the final state. $\Sigma = \{a,b\}$.					[5+5 = 10]	CO2	L2, L3			
		a	b								
q _s		{q _s , q ₁ }	{q _s }								
q ₁		{q ₂ }	{q ₂ }								
q ₂		{Φ}	{Φ}								
3	(a) Define regular expression formally. (Show the base class and inductive class both formally). (b) “For each regular expression there exist an NFA - epsilon” – Justify the statement intuitively and show all the required constructions.					[5 + 5=10]	CO3	L2, L3			

P.T.O.

Internal Assessment Test 1 – November 2021

Sub:	Computer Networks and Security					Sub Code:	18CS52	Branch:	ISE		
Date:	11/11/2021	Duration:	90 min's	Max Marks:	50	Sem/Sec:	V A, B & C			OBE	
Answer any FIVE FULL Questions								MARKS	CO	RBT	
1	(a) Write down the formal definition of Nondeterministic finite automata (NFA). Define extended transition function and L(M) where L is the language and M is the machine. (b) Define Epsilon closure of Nondeterministic finite automata with epsilon/null move. (NFA - epsilon).					[6+4=10]	CO1	L2			
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q _s		{q _s , q ₁ }	{q _s }								
q ₁		{q ₂ }	{q ₂ }								
q ₂		{Φ}	{Φ}								
3	(a) Define regular expression formally. (Show the base class and inductive class both formally). (b) “For each regular expression there exist an NFA - epsilon” – Justify the statement intuitively and show all the required constructions					[5+5 = 10]	CO3	L2, L3			

4	<p>Construct regular expression for the following regular languages.</p> <p>(a) L = Set of all strings where 'aa' and 'bb' should not come together. $\Sigma = \{a,b\}$</p> <p>(b) L = $\{a^n b^m \mid n \geq 1, m \geq 1, nm \geq 3\}$, $\Sigma = \{a,b\}$,</p> <p>(c) L = Set of all strings where second symbol from right hand side is always 'a'. $\Sigma = \{a,b\}$</p> <p>(d) Set of all strings - start with 'a' and end with 'b', but 'bb' should not come together. $\Sigma = \{a,b\}$,</p>	[2.5+2.5+2.5+2.5 = 10]	CO2, CO3	L3																				
5	<p>(a) Convert the following regular expression to NFA.</p> <p>$Y^*(XX^*(YY^* + \epsilon) + \epsilon)$, $\Sigma = \{X,Y\}$, $\epsilon = \text{epsilon/Null move}$</p> <p>(b) Convert the following NFA to regular expression. A is start and final state. $\Sigma = \{X,Y\}$</p> <table border="1" data-bbox="191 485 867 638"> <tr> <td></td> <td>X</td> <td>Y</td> </tr> <tr> <td>A</td> <td>{B}</td> <td>{C}</td> </tr> <tr> <td>B</td> <td>{Φ}</td> <td>{A}</td> </tr> <tr> <td>C</td> <td>{A}</td> <td>{B}</td> </tr> </table>		X	Y	A	{B}	{C}	B	{Φ}	{A}	C	{A}	{B}	[5+5=10]	CO3	L3								
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P.T.O.

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q_2	{ q_2 }	{Φ}	{Φ}	{Φ}																				

Faculty Signature

CCI Signature

HOD Signature