L.J INSTITUTE OF ENGINEERING AND TECHNOLOGY, Ahmedabad
THEORY OF COMPUTATION(TOC)
SEM-IV CE/IT DEPARTMENT

subject_code	unit_number	chapter_number	group_id	Keywords	question_text	Type	answer_text	marks	difficulty_level	previous_year	option1	option2	option3	option4
01701349 2	1	1	1	Basics of Automata	Give True or False: If A ⊆ B and B ⊆ C then A ⊆ C	True/False	True	1	Easy					
01701349 2	1	1	2	Basics of Automata	Give True or False: If x ∈ A and A ⊆ B then x ∈ B	True/False	True	1	Easy					
01701349 2	1	1	3	Basics of Automata	If n(A) = 110, n(B) = 300, n(A – B) = 50 then find n(A ∪ B)	MCQ	350	1	Easy		300	360	110	350
01701349 2	1	1	4	Basics of Automata	RR* can be expressed in which of the forms:	MCQ	a) R+	1	Easy		a) R+	b) R-	c) R+ U R-	d) R
01701349 2	1	1	5	Basics of Automata	If ∑= {0,1}, then Φ* will result to:	MCQ	a) ε	1	Easy		a) ε	b) Φ	c) ∑	d) None of the mention
01701349 2	1	1	6	Basics of Automata	Which among the following is not an associative operation?	MCQ	d) None of the mentioned	1	Easy		a) Union	b) Concatenation	c) Dot	d) None of the mentioned
01701349 2	1	1	7	Regular Expression	Which of the following statements about Regular Expression Is/are	MCQ	c) The itera	1	Medium		a) The unio	b) The conc	c) The iterat	d) All

					incorrect?		tion of a regular expression is also a regular expression				n of two regular expressions is also a regular expression	aten atio n of two regular expressions is also a regular expression	ion of a regular expression is also a regular expression	
01701349 2	1	1	8	Basics of Automata	Dot operator in regular expression resembles which of the following?	MCQ	a) Expressions are juxtaposed	1	Medium		a) Expressions are juxtaposed	b) Expressions are multiplied	c) Cross operation	d) None of the mentioned
01701349 2	1	1	9	Basics of Automata	Which of the following regular expressions represents the set of strings which do not contain a substring ‘rt’ if ∑= {r, t}	MCQ	d) (t*r*)	1	Hard		a) (rt)*	b) (tr)*	c) (r*t*)	d) (t*r*)
01701349 2	1	1	10	Basics of Automata	If ∑= {0,1}, then Φ* will result to:	MCQ	a) ε	1	Medium		a) ε	b) Φ	c) ∑	d) None of the mentioned

0170 1349 2	1	1	11	Basics of Automata	Finite automata requires minimum _____ number of stacks.	Short Que.	0	1	Easy					
0170 1349 2	1	1	12	Basics of Automata	FSM with output capability can be used to add two given integer in binary representation.	True /False	True	1	Easy					
0170 1349 2	1	1	13	Basics of Automata	Differentiate between (a.b) and (a+b)?	Short Que.		1	Easy					
0170 1349 2	1	1	14	Basics of Automata	Define: Transition Diagram	Short Que.		1	Easy					
0170 1349 2	1	1	15	Basics of Automata	What are the applications of automata theory?	Short Que.		1	Medium					
0170 1349 2	1	1	16	Basics of Automata	What is a Regular language ?	Short Que.		1	Medium					
0170 1349 2	1	1	17	Basics of Automata	Differentiate L* and L+	Short Que.		1	Medium					
0170 1349 2	1	1	18	Basics of Automata	What is the closure property of regular sets?	Short Que.		1	Medium					
0170 1349 2	1	1	19	Basics of Automata	The appropriate precedence order of operations over a Regular Language is	MCQ	Kleene, Dot, Union	1	Easy		Kleene, Union, Concatenate	Kleene, Star, Union	Kleene, Dot, Union	star, Union, Dot

0170 1349 2	2	2	20	Regular Expression	RR* can be expressed in which of the forms:	MCQ	a) R+	1	Medium		a) R+	b) R-	c) R+ U R-	d) R
0170 1349 2	2	2	21	Basics of Automata	What Automata Theory ?	Short Ques		1	Easy					
0170 1349 2	2	2	22	Basics of Automata	What is the difference between the strings and the words of a language?	Short Que.		1	Easy					
0170 1349 2	2	2	23	Regular Expression	Define Regular Expression?	Short Que.		1	Easy					
0170 1349 2	2	2	24	Basics of Automata	Define FA	Short Que.		1	Medium					
0170 1349 2	2	2	25	Regular Expression	Regular expression for all strings starts with ab and ends with bba is?	Short Que.		2	Medium					
0170 1349 2	2	2	26	Basics of Automata	The basic limitation of finite automata is that.	MCQ	It can't remember arbitrary large amount of information.	1	Medium		It can't remember arbitrary large amount of information.	It sometimes recognize grammar that are not regular	) It sometimes fails to recognize regular grammar	All of the mentioned
0170 1349 2	2	2	27	Regular Expression	Which of the following is not a regular expression?	MCQ	[(0+1)-(0b+a1)*	1	Medium		[(a+b)*-(aa+bb)	[(0+1)-(0b+a1)*	(01+11+10)*	(1+2+0)*(1+2)*

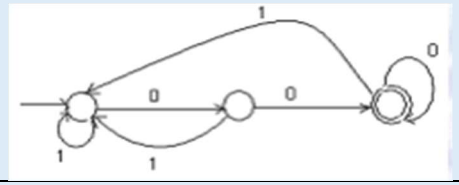
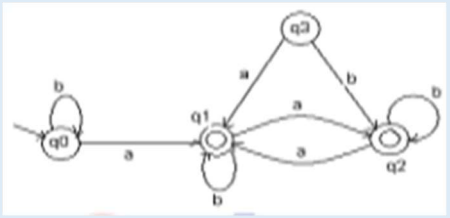
							(a+b)]*					(a+b)]*		
01701349 2	2	2	28	Regular Expression	The language described by the regular expression (0+1)*0(0+1)*0(0+1)* over the alphabet {0 1} is the set of	MCQ	All strings containing at least two 0's	1	Hard		All strings containing at least two 1's	All strings that begin and end with either 0's or 1's	All strings containing at least two 0's	All strings containing the substring 00
01701349 2	2	2	29	Regular Expression	What is a Regular language?	Short Que.		1	Medium					
01701349 2	2	2	30	Regular Expression	Construct a r.e for the language which accepts all strings with atleast two c's over the set Σ={c,b}	Short Que.		1	Medium					
01701349 2	2	2	31	Regular Expression	Give a regular expression for the following regular language: The set of all strings containing 00.	Short Que.		1	Medium					
01701349 2	2	2	32	Regular Expression	for which of the following applications regular expressions can be used ?	MCQ	All of these	1	Easy		Designing compilers	Developing text editors	Simulating sequential circuits	All of these
01701349 2	2	2	33	Regular Expression	Regular Expression R and the language it describes can be represented as:	MCQ	c) R, L(R)	1	Easy		a) R, R(L)	b) L(R), R(L)	c) R, L(R)	d) All of the mentioned

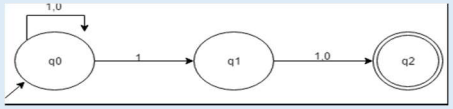
0170134922	2	2	34	Regular Expression	If R is a regular expression, then which of the followings is FALSE?	MCQ	d) (R*)* = R+	1	Easy		a) R*= R*+ ε	b) R*R*= R*	c) εR= R	d) (R*)* = R+
0170134922	2	2	35	Regular Expression	Define Dead-End State with Example	Short Que.		1	Medium					
0170134922	2	2	36	Regular Expression	Write Regular Expressions for the following languages of all strings in {0,1}* (i) Strings that do not end with 01. (ii) Strings with odd numbers of 1's (Ones)	Short Que.		2	Medium					
0170134922	2	2	37	Regular Expression	Define regular language and regular expressions	Short Que.		1	Medium					
0170134922	2	2	38	Regular Expression	Find regular expression for the following: • Describe the language corresponding to following: (1+01)*(0+01)*	Short Que.		2	Medium					
0170134922	2	2	39	Regular Expression	Write Regular Expressions for the following languages of all strings in {0,1}* (i) Strings that start with 1 and do not end with 10. (ii) Strings with length 6 or less	Short Que.		2	Medium					
0170134922	2	2	40	Regular Expression	Find a regular expression corresponding to each of the following subsets of {0, 1}*. i. The language of all strings that do not contain the substring 110. ii. The language of all strings containing both 101 and 010 as substrings. iii. The language of all strings in which both the number of 0's and the number of l's are odd	Short Que.		2	Hard					
0170134922	2	2	41	Regular Expression	Write a regular expression for language L over {0,1} such that every string in L i) Begins with 00 and ends with 11. ii) Contains alternate 0 and 1	Short Que.		2	Hard					

01701349 2	2	2	42	Regular Expression	Prove the formula (00*1)*1 = 1+0(0+10)*11	Short Que.		2	Hard					
01701349 2	2	2	43	Regular Expression	Write regular expression for the following languages i) L1 = {x ε (0,1)* | x do not ends with 11} ii) L2 = {x ε (0,1)* | x contains both 101 and 110}	Short Que.		2	Hard					
01701349 2	2	2	44	Regular Expression	Find regular expression for following i. Language of all strings containing exactly two 0's. ii. Language of all strings that begins or ends with 00 or 11. iii. Language of all strings in which every 0 is followed immediately by 11	Short Que.		2	Hard					
01701349 2	2	2	45	Regular Expression	Write Regular Expressions for the following languages of all strings in {0,1}* (i) Strings that do not end with 01. (ii) The language of all strings containing both 101 and 010 as substrings	Short Que.		2	Hard					
01701349 2	2	2	46	Regular Expression	Write RE for the languages of all Strings that do not end with 01.	Short Que.		1	Hard					
01701349 2	2	2	47	Regular Expression	Show that for any language L, L*= (L*)* = (L*)+ = (L+)*	Short Que.		1	Hard					
01701349 2	2	2	48	Regular Expression	Write Regular Expression corresponding to each of the following subsets of{0, 1}* a. The language of all strings containing both 101 and 010 as substrings. b. The language of all strings in which both the number of 0's and the number of 1's are even	Short Que.		2	Hard					
01701349 2	2	2	49	Regular Expression	L1 and L2 are two languages: L1 = {x | 11 is not a substring of x} L2 = {x | x starts with 0 and ends with 0} Draw FA for both L1 and L2 and construct FA for L3 = L2 - L1	Short Que.		2	Hard					

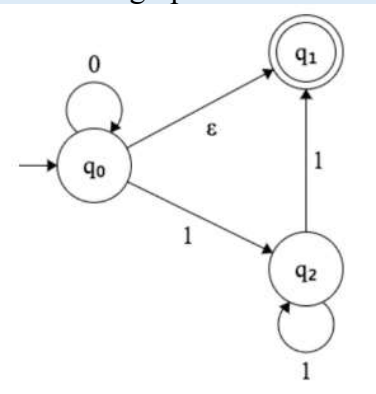
0170 1349 2	2	2	50	Regular Expression	Find a regular expression corresponding to each of the following subsets of {0, 1}* 1. The language of all strings that begin or end with 00 or 11. 2. The language of all strings containing both 11 and 010 as substrings	Short Que.		2	Hard					
0170 1349 2	2	2	51	Closure properties	What are the closure properties of regular languages?	Short Que.		1	Easy					
0170 1349 2	2	2	52	Regular Expression	Find a regular expression corresponding to each of the following subsets of {0, 1}* (i) The language of all strings that begin or end with 00 or 11. (ii) The language of all strings beginning with 1 and ending with 0	Short Que.		2	Medium					
0170 1349 2	2	2	53	Regular Expression	What are the applications of regular expressions and finite automata?	Short Que.		2	Medium					
0170 1349 2	2	2	54	Regular Expression	Write Regular Expression over the alphabets {a, b} consisting strings: Second last character as ‘a’ Starting with ‘a’ and ending with ‘b’	Short Que.		2	Medium					
0170 1349 2	2	2	55	Regular Expression	Define Regular Expression. Find Regular Expression corresponding to each of the following subsets of {0,1}* 1) The Language of all strings containing exactly two 0’s 2) The Language of all strings that end with 01 3) The Language of all strings that begin or end with 00 or 11	Short Que.		2	Medium					
0170 1349 2	2	2	56	Regular Expression	Write regular expressions for the following languages defined over ∑ = {0, 1}: (i) The language of all the strings that do not end with 01. (ii) The language of all the strings containing even number of 0’s and even number of 1’s	Short Que.		2	Medium					

0170 1349 2	2	2	57	Regular Expression	Find a regular expression of following subsets of {0, 1}* 1. The language of all strings that begin or end with 00 or 11. 2. The language of all strings ending with 1 and not containing 00.	Short Que.		2	Medium					
0170 1349 2	2	2	58	Regular Expression	Find a regular expression of following subsets of {0, 1}*1. The language of all strings that contain odd number of 1's 2. The language of all strings with next to last symbol 0	Short Que.		2	Medium					
0170 1349 2	2	2	59	Regular Expression	Find a regular expression corresponding to each of the following subsets of {0,1}* (i). the language of all strings that do not end with 01 (ii). the language of all strings that begin with or end with 00 or 11	Short Que.		2	Medium					
1701 3492	3	3	60	FA-1	Finite automata requires minimum _____ number of stacks.	Remembering-Multiple_Choice	0	1	Easy		0	1	2	3
1701 3492	3	3	61	FA-1	FSM with output capability can be used to add _____ given integer in binary representation.	Understanding-Multiple_Choice	2	1	Easy		3	1	0	5
1701 3492	3	3	62	FA-1	We can represent one language in more one FSMs, true or false?	Understanding-Multiple_Choice	TRUE	1	Easy		May be true	TRUE	Cannot be said	FALSE
1701 3492	3	3	63	FA-1	"The basic limitations of Finite Automata is	Understanding-Multiple_Choice	It can’t remember arbitrary	1	Easy		It sometime recognized	It can’t remember arbit	It some time fails to recognize	All of the mentioned

							large amount of information.				grammar that are not regular	rary large amount of information.	the Regular grammar.	
17013492	3	3	64	FA-1	A language is regular if and only if	Remembering-Multiple_Choice	Accepted by DFA	1	Easy		Accepted by PDA	Accepted by LBA	Accepted by Turing Machine	Accepted by DFA
17013492	4	4	65	FA-2	"The DFA shown below accepts the set of all strings over {0,1} that 	Evaluating-Multiple_Choice	End with 00	1	Hard		End with 0	End with 00	Begin either with 0 or 1	Contain the substring 00
17013492	4	4	66	FA-2	Which one of the following is true for the automata 	Evaluating-Multiple_Choice	b*a(a+b)*	1	Hard		b*ab*ab*ab*	b*ab*ab*	b*a(a+b)*	(a+b)*
17013492	3	3	67	FA-1	There are _____ tuples in finite state machine.	Remembering-Multiple_Choice	5	1	Easy		4	3	5	0
17013492	3	3	68	FA-1	Number of states require to accept string ends with 10.	Evaluating-Multiple_Choice	3	1	Easy		4	3	5	0

1701 3492	3	3	69	FA-1	Statement:  The DFA shown represents all strings which has 1 at second last position.	Evaluating-Multiple_Choice	Wrong proposition	1	Hard		May be correct	Correct	Wrong proposition	Incorrect, Incomplete DFA
1701 3492	3	3	70	FA-1	Language of finite automata is.	Remembering-Multiple_Choice	Type 3	1	Easy		Type 0	Type 1	Type 3	Type 4
1701 3492	3	3	71	FA-1	Number of final state require to accept Φ in minimal finite automata.	Understanding-Multiple_Choice	No Final State Required	1	Easy		1	2	No Final State Required	4
1701 3492	4	4	72	FA-2	Regular expression for all strings starts with ab and ends with bba is.	Applying-Multiple_Choice	ab(a+b)*bba	1	Easy		aba*b*bba	ab(ab)*bba	ab(a+b)*bba	All of the mentioned
1701 3492	4	4	73	FA-2	NFA, in its name has ’non-deterministic’ because of :	Remembering-Multiple_Choice	The choice of path is non-deterministic	1	Easy		The result is undetermined	The state to be transited next is non-deterministic	None of the mentioned	The choice of path is non-deterministic
1701 3492	3	3	74	FA-1	Which of the following option is correct?	Understanding-Multiple_Choice	NFA is slower to process	1	Easy		NFA is slower to process	DFA is faster to process	NFA is slower to process	DFA is slower to process

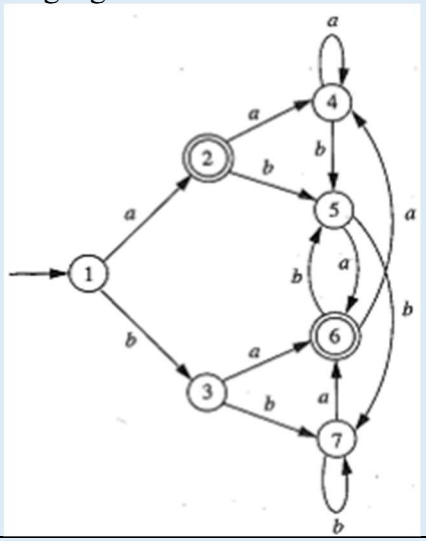
							and its representation uses less memory than DFA				and its representation uses more memory than DFA	and its representation uses less memory than NFA	and its representation uses less memory than DFA	and its representation uses less memory than NFA
17013492	3	3	75	FA-1	What is wrong in the given definition? Def: ({q0, q1, q2}, {0,1}, δ, q3, {q3})	Evaluating-Multiple_Choice	Initial and Final states do not belong to the Graph	1	Hard		Initial and final states can't be same	The definition does not satisfy 5 Tuple definition of NFA	Initial and Final states do not belong to the Graph	There are no transition definition
17013492	3	3	76	FA-1	What is the relation between DFA and NFA on the basis of computational power?	Remembering-Multiple_Choice	Equal	1	Easy		DFA > NFA	NFA > DFA	Equal	Can't be said

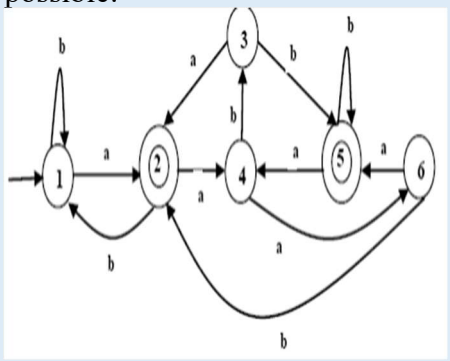
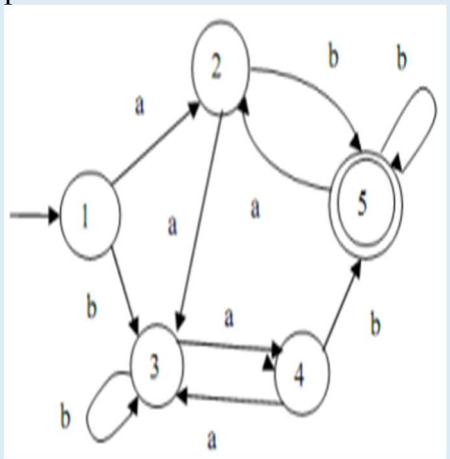
1701 3492	3	3	77	FA-1	ε- closure of q1 in the given transition graph: 	Evaluating-Multiple_Choice	{q0, q1}	1	Easy		{q1}	{q1, q2}	{q0, q1, q2}	{q0, q1}
1701 3492	3	3	78	FA-1	According to the given transitions, which among the following are the epsilon closures of q1 for the given NFA? Δ (q1, ε) = {q2, q3, q4} Δ (q4, 1) = q1 Δ (q1, ε) = q1	Evaluating-Multiple_Choice	{q1, q2, q3, q4}	1	Easy		{q4}	{q1, q2, q3, q4}	{q1, q3}	{q1, q3,q4}
1701 3492	3	3	79	FA-1	Given: ∑= {a, b} L= {xϵ∑*|x is a string combination} ∑4 represents which among the following?	Evaluating-Multiple_Choice	{aaaa, abab, ε, abaa, aabb}	1	Easy		{aa, ab, ba, bb}	{aaaa, abab, ε, abaa, aabb}	{aaa, aab, aba, bbb}	All of the mentioned
1701 3492	3	3	80	FA-1	Which of the following pairs of regular expression are not equivalent?	Evaluating-Multiple_Choice	none of the above	1	Medium		(a+b)* and (a*+b)*	(a*+b)* and (a+b)*	(ab)* a and a(ba)*	none of the above
1701 3492	3	3	81	FA-1	We have two statements S1 and S2 whose definition are as follows: S1 – {02n In ≥ I} is a regular language. S2 – {0m 1n 0 1m+n Im=1 and n≥1I is a regular language.	Evaluating-Multiple_Choice	Only S1 is correct	1	Medium		Both S1 and S2 are correct	Only S1 is correct	Neither S1 nor S2 is correct	Only S2 is correct

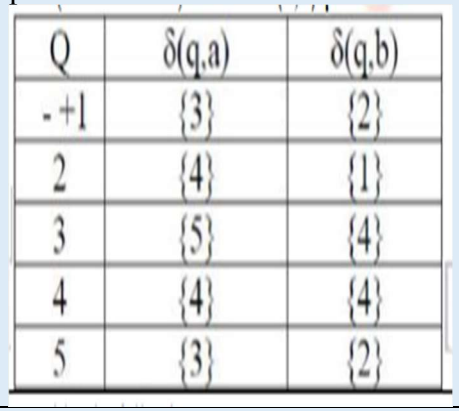
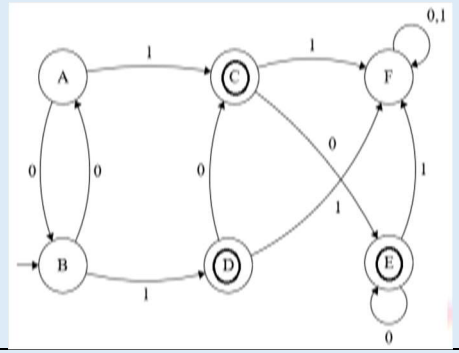
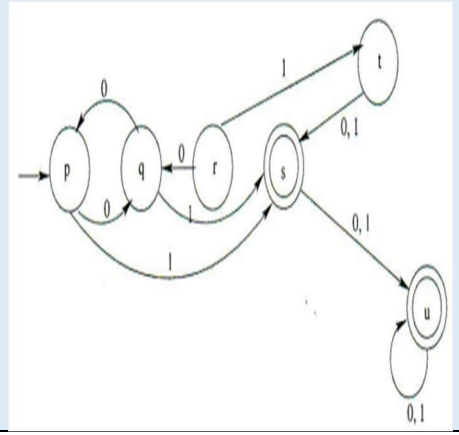
					Which one of the following statements is correct?									
1701 3492	3	3	82	FA-1	The minimum number of states in any DFA accepting the regular language L = (111+11111)* is	Evaluating-Multiple_Choice	9	1	Hard		7	5	9	11
1701 3492	3	3	83	FA-1	How many states are present in the smallest finite automaton which accepts the language {x I length of x is divisible by 3}?	Evaluating-Multiple_Choice	4	1	Medium		4	5	3	2
1701 3492	3	3	84	FA-1	Which of the following regular expression identities are true ?	Remembering-Multiple_Choice	(r + s)* = (r*s *)*	1	Medium		(r + s)* = r* s*	(r + s)* = (r*s *)*	(r + s)* = r* + s*	r* s* = r* + s*
1701 3492	4	4	85	FA-2	Draw FA for Regular Expression: (111 + 100)*0	Applying-Short_Answer_2_5_Min		2	Hard					
1701 3492	4	4	86	FA-2	Draw FA for Regular Expression: (11 + 100)*1	Applying-Short_Answer_2_5_Min		2	Hard					
1701 3492	4	4	87	FA-2	Draw FA for Regular Expression: 0(10 + 01)* + 1(00 + 01)*	Applying-Short_Answer_2_5_Min		2	Medium					
1701 3492	4	4	88	FA-2	Draw FA for the string 1) The string with next to last symbol as 0. 2) The string with number of 0's odd and numbers of 1's odd.	Evaluating-Long_Answer_5_10_Min		4	Medium					
1701 3492	4	4	89	FA-2	Draw FA for 1) (11 + 110)*0 2) {11}*{00}*	Evaluating-Long_Answer_5_10_Min		4	Hard					
1701 3492	4	4	90	FA-2	Draw FA for the string 1) The string in {0,1}* ending in 10 or 11.	Evaluating-Long_Answ		4	Hard					

					2) The string end with 1 and does not contain substring 00	er_5_10_Min								
1701 3492	4	4	91	FA-2	Draw FA for the strings: 1) The string in {a,b}* ending in aba. 2) The string corresponding to regular expression (111 + 100)*0.	Evaluating-Long_Answer_5_10_Min		4	Hard					
1701 3492	4	4	92	FA-2	Draw FA for the strings: 1) The string in {0,1}* ending in 00 or 01. 2) The string corresponding to regular expression (10 + 110)*1.	Evaluating-Long_Answer_5_10_Min		4	Hard					
1701 3492	4	4	93	FA-2	Draw FA for the corresponding language 1) 1(01 + 10)* + 0(11 + 10)* 2) (010 + 00)* (10)*	Evaluating-Long_Answer_5_10_Min		4	Hard					
1701 3492	4	4	94	FA-2	Draw FA for the corresponding language 1) (1+110)*0 2) (1+10+110)*0	Evaluating-Long_Answer_5_10_Min		4	Hard					
1701 3492	4	4	95	FA-2	Draw FA for the corresponding language 1) 1(1+10)*+10(0+01)* 2) 0+(10)*+01*0	Evaluating-Long_Answer_5_10_Min		4	Hard					
1701 3492	4	4	96	FA-2	Draw FA for the string 1) The string with number of 0's odd and numbers of 1's even. 2) (0+1)(01)*(011)*	Evaluating-Long_Answer_5_10_Min		4	Medium					
1701 3492	4	4	97	FA-2	Draw FA for accepting: 1) The string in {0,1}* ending in 1 and not containing substring 00. 2) The string with even numbers of 0's and even numbers of 1's.	Evaluating-Long_Answer_5_10_Min		4	Medium					
1701 3492	4	4	99	FA-2	Draw DFA for the following languages	Evaluating-Long_Answ		4	Medium					

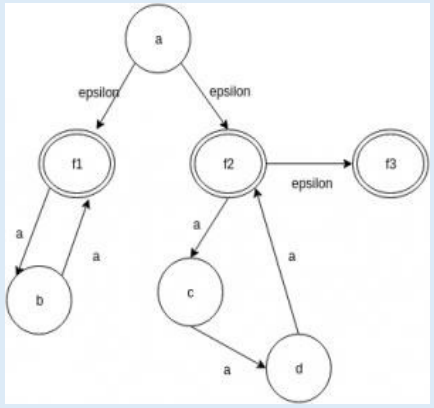
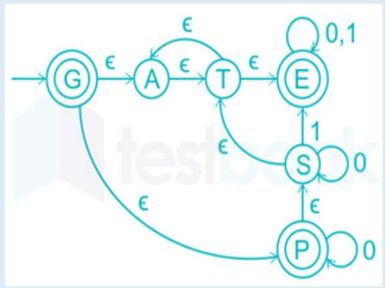
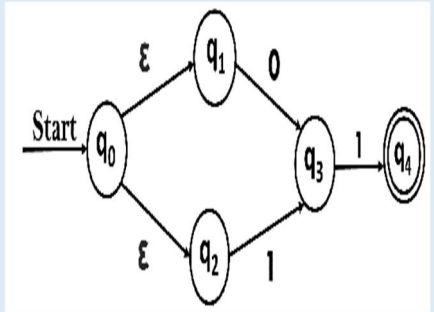
					1) L1={x ϵ (0,1)*|x contains 110111} 2) L2={x ϵ (0,1)*|x contains odd numbers of 1's and even numbers of 0's}	er_5_10_Min								
1701 3492	4	4	100	FA-2	Draw DFA for the following languages 1) L1={x ϵ (0,1)*|x do not contains 110} 2) L2={x ϵ (0,1)*|x do not contain 00 as a substring}	Evaluating-Long_Answer_5_10_Min		4	Medium					
1701 3492	4	4	101	FA-2	Draw FA for each of the following RE: 1) (0+1)*(1+00) (0+1)* 2) (0+1)*(01+110)	Evaluating-Long_Answer_5_10_Min		4	Hard					
1701 3492	4	4	102	FA-2	Draw DFA for the following languages 1) L1={x ϵ (0,1)*|x end with 01} 2) (0+1)*(10+11)	Evaluating-Long_Answer_5_10_Min		4	Medium					
1701 3492	4	4	103	FA-2	Draw FA for the following languages 1) L1={x ϵ (0,1)*|ends with 11} 2) L2={x ϵ (0,1)*|x contains both 101 and 110}	Evaluating-Long_Answer_5_10_Min		4	Medium					
1701 3492	4	4	104	FA-2	An NFA with states 1-5 and input alphabets {a,b} has following transition table Q-1 Draw its transition diagram Q-2 Calculate δ*(1,a) Q-3 Calculate δ*(1,aaabaab) q | $\partial(q,a)$ | $\partial(q,b)$ 1 | {1,2} | {1} 2 | {3} | {3} 3 | {4} | {4} 4 | {5} | Ø 5 | Ø | {5}	Evaluating-Long_Answer_5_10_Min		4	Medium					

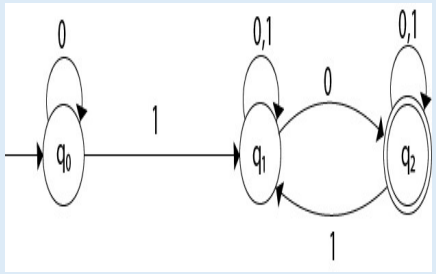
1701 3492	4	4	105	FA-2	Draw FA for each of the following RE 1) (a+b)*baaa 2) (bbb + baa)*a	Evaluating-Long_Answer_5_10_Min		4	Medium					
1701 3492	4	4	106	FA-2	For following NFA, find minimum FA accepting same language 	Evaluating-Long_Answer_5_10_Min		4	Medium					
1701 3492	4	4	107	FA-2	For the following RE, draw an NFA 1) (a+b)*(abba* + (ab)*ba) 2) (aa+aab)*b	Evaluating-Long_Answer_5_10_Min		4	Medium					
1701 3492	4	4	108	FA-2	For the following RE, draw an NFA 1) ((0+1)*10 + (00)*(11)*)* 2) (0+1)*1(0+1)	Evaluating-Long_Answer_5_10_Min		4	Medium					
1701 3492	4	4	109	FA-2	For the following RE, draw an NFA 1) (0+1)*(011+01010)(0+1)* 2) (0+1)(01)*(011)*	Evaluating-Long_Answer_5_10_Min		4	Medium					
1701 3492	4	4	110	FA-2	For the following RE, draw an NFA 1) (0+1)*(10+110)*1 2) 0*(01)*1+1*0	Evaluating-Long_Answ		4	Medium					

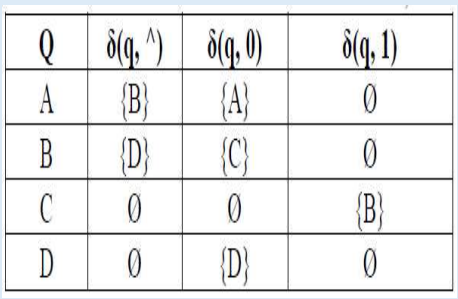
						er_5_10_Min								
17013492	4	4	111	FA-2	Minimize the following DFA if possible:  	Evaluating-Long_Answer_5_10_Min		4	Medium					
17013492	4	4	112	FA-2	Minimize the following DFA if possible:  	Evaluating-Long_Answer_5_10_Min		4	Medium					
17013492	4	4	113	FA-2	Calculate δ*(1,abbaa) & δ*(1,abaabba) form following transition table. q | $\delta(q,a)$ | $\delta(q,b)$ 1 | {1,2} | {1} 2 | {3} | {3} 3 | {4} | {4} 4 | {5} | Ø 5 | Ø | {5}	Evaluating-Long_Answer_5_10_Min		4	Medium					

1701 3492	4	4	114	FA-2	Minimize the following DFA if possible:  	Evaluating-Long_Answer_5_10_Min		4	Easy					
1701 3492	4	4	115	FA-2	Minimize the following DFA if possible:  	Evaluating-Long_Answer_5_10_Min		4	Easy					
1701 3492	4	4	116	FA-2	Minimize the following DFA if possible:  	Evaluating-Long_Answer_5_10_Min		4	Medium					

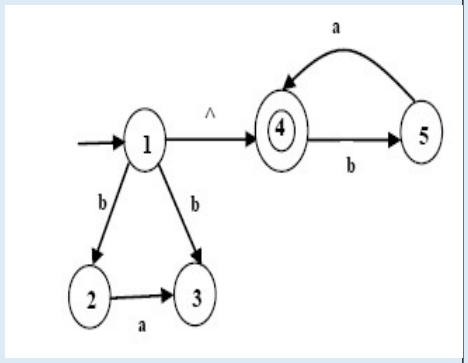
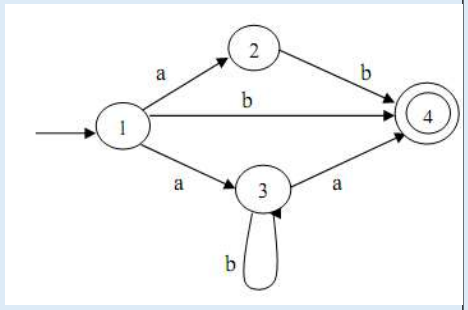
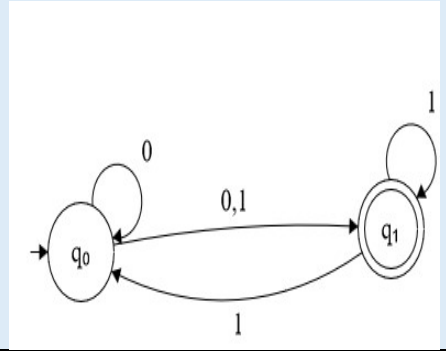
1701 3492	4	4	117	FA-2	Find ^-closure of the each of the states in following NFA-^ q | δ(q,a) | δ(q,b) | δ(q,Λ) 1 | ø | ø | {2} 2 | {3} | ø | {5} 3 | ø | {4} | ø 4 | {4} | ø | {1} 5 | ø | {6,7} | ø 6 | {5} | ø | ø 7 | ø | ø | {1}	Evaluating-Short_Answer_2_5_Min		2	Medium					
1701 3492	4	4	118	FA-2	Consider the NFA-^ depicted in following table 1) Compute the ^-closure of each states. 2) Find δ*(q0,1111) 3) Find δ*(q0,0011) 4) Find δ*(q0,1001) 5) Find δ*(q0,0111) q | δ(q,0) | δ(q,1) q_0 | q_0 | q_0, q_1 q_1 | q_2 | q_2 q_2 | q_3 | q_3 q_3 | ø | ø	Evaluating-Long_Answer_5_10_Min		4	Medium					
1701 3492	4	4	119	FA-2	Consider the NFA-^ depicted in following table 1) Compute the ^-closure of each states. 2) Find δ*(q0,abab) 3) Find δ*(q0,aaabbb) | Λ | a | b | c →p | Φ | {p} | {q} | {r} q | {p} | {q} | {r} | Φ *r | {q} | {r} | Φ | {p}	Evaluating-Long_Answer_5_10_Min		4	Medium					

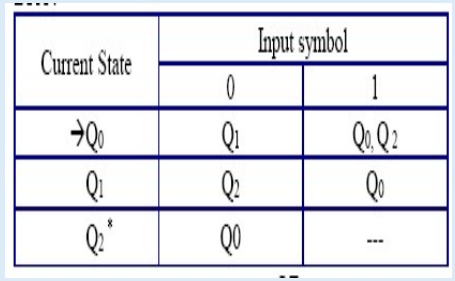
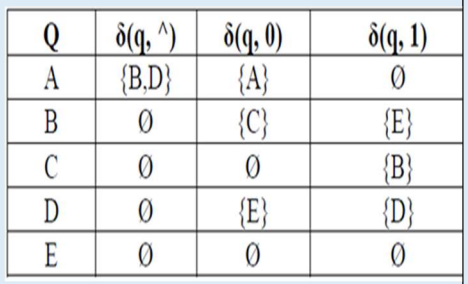
0170 1349 4	05	05	120	Finite Automata with Epsilon Transition	Which of the following belongs to the epsilon closure set of a? 	Evaluating Multiple-Choice	{a, f1, f2, f3}	1	Medium		{a, f1, f2, f3}	{a, f1, f2}	{f1, f2, f3}	{a, f2, f3}
0170 1349 4	05	05	121	Finite Automata with Epsilon Transition	Which of the following belongs to the epsilon closure set of S? 	Evaluating Multiple-Choice	{S, T, A, E}	1	Medium		{S, T}	{S, T, A, E}	{S}	{S, P, T}
0170 1349 4	05	05	122	Conversion from finite automata with Epsilon Transition to Determinstic finite automata	While converting NFA with null to DFA, what will be δ'(A, 0) for the following NFA? 	Evaluating Multiple-Choice	{q3}	1	Hard		{q0, q1, q2}	{q1, q2}	{q3}	{q0, q1}

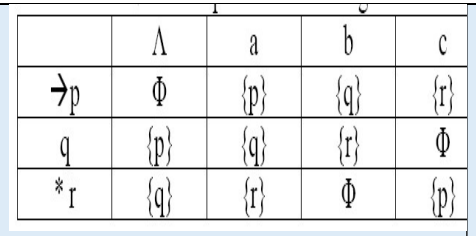
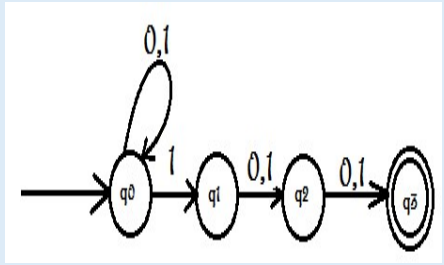
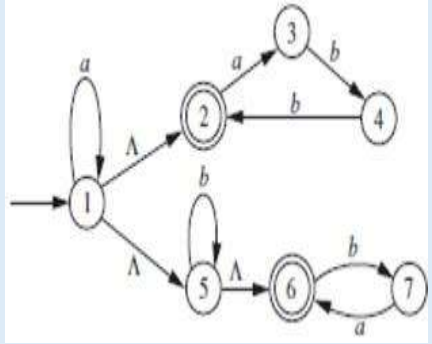
01701349 4	05	05	123	Conversion from Non - Deterministic finite automata to Determinstic finite automata	Which new state is generated while converting NFA to DFA and finding δ'([q1], 0)? 	Evaluating-Multiple-Choice	[q1, q2]	1	Hard		[q0, q1, q2]	[q1, q2]	[q2]	[q1]
01701349 4	05	05	124	Conversion from Deterministic finite automata to Non-Deterministic finite automata	Conversion of a DFA to an NFA?	Understanding-Multiple-Choice	Requires the subset construction	1	Easy		Is impossible	Requires the subset construction	Is chancy	Is nondeterministic
01701349 4	05	05	125	Non-Deterministic finite automata	If we consider an arbitrary NFA (non-deterministic finite automaton) with N states in total, the maximum number of states that are there in an equivalent DFA (minimized) is at least:	Understanding-Multiple-Choice	2^N	1	Easy		N!	2N	2^N	N^2
01701349 4	05	05	126	Determinstic finite automata ,Non-Deterministic finite	The total time needed to run any input string in DFA is ……. than time required in NFA.	Understanding-Multiple-Choice	less	1	Easy		more	less	equal	None of these

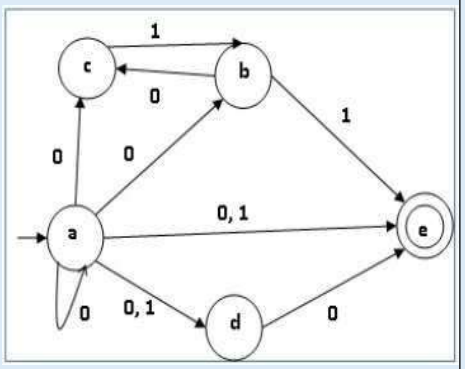
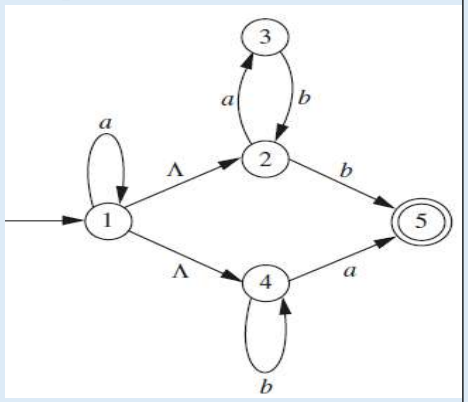
				automata										
01701349 4	05	05	127	Deterministic finite automata ,Non-Deterministic finite automata	Which of the following cannot use Empty String transition?	Understanding-Multiple-Choice	DFA	1	Easy		FA	NFA	DFA	All of these
01701349 4	05	05	128	Non-Deterministic finite automata	Which of the following can use Empty String transition?	Understanding-Multiple-Choice	NFA	1	Easy		FA	NFA	DFA	All of these
01701349 4	05	05	129	Conversion from Non - Deterministic finite automata with epsilon to Deterministic finite automata and Non-Deterministic finite automata	Convert NFA-^ to NFA and DFA. Initial State: A, Final State: D 	Evaluating-Long_Answer_5_10_Min		5	Hard					

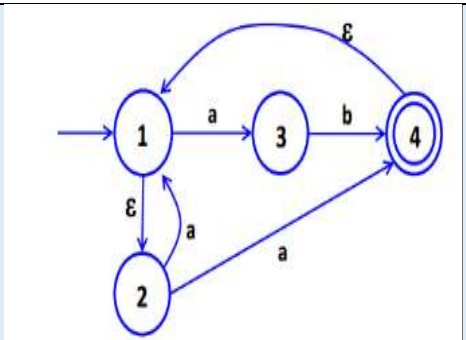
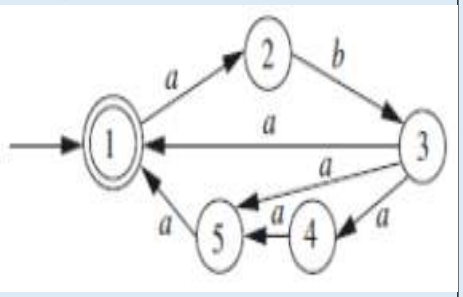
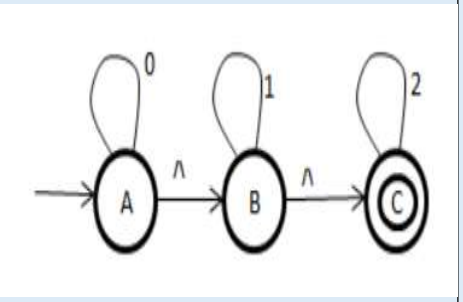
Q	δ(q, ^)	δ(q, 0)	δ(q, 1)
A	{B}	{A}	∅
B	{D}	{C}	∅
C	∅	∅	{B}
D	∅	{D}	∅

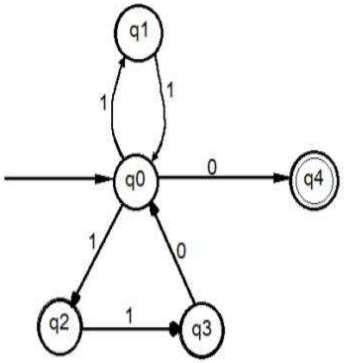
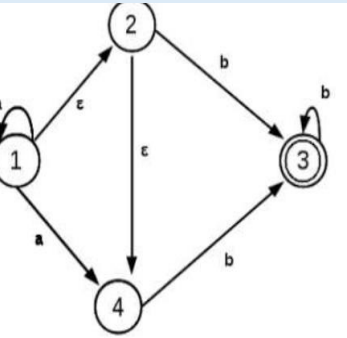
0170134944	05	05	130	Conversion from Non - Deterministic finite automata with epsilon to Deterministic finite automata	Convert the following NFA- Λ into FA. 	Evaluating-Long_Answer_5_10_Min		5	Hard					
0170134944	05	05	131	Conversion from Non - Deterministic finite automata to Deterministic finite automata	Convert the following NFA into FA. 	Evaluating-Long_Answer_5_10_Min		4	Medium					
0170134944	05	05	132	Conversion from Non - Deterministic finite automata to Deterministic finite	Convert the following NFA to DFA 	Evaluating-Short_Answer_2_5_Min		4	Medium					

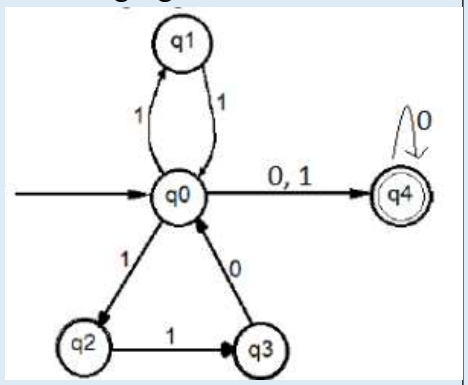
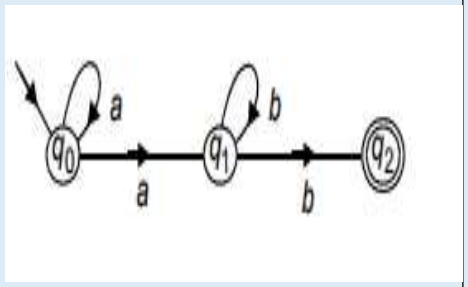
				automata										
0170134944	05	05	133	Conversion from Non - Deterministic finite automata to Deterministic finite automata	Convert the NFA given in Table below to its corresponding DFA and draw the DFA.  	Evaluating-Short_Answer_2_5_Min		4	Hard					
0170134944	05	05	134	Conversion from Non - Deterministic finite automata with epsilon to Deterministic finite automata and Non-Deterministic finite automata	Convert NFA-^ to NFA and DFA. Initial State: A , Final State: E  	Evaluating-Long_Answer_5_10_Min		5	Hard					
0170134944	05	05	135	Conversion from Non -	Consider the NFA-Λ depicted in following table:	Evaluating-Long_Answ		4	Hard					

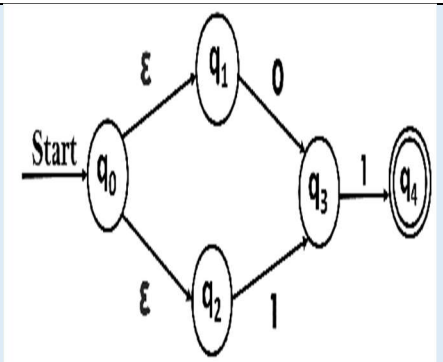
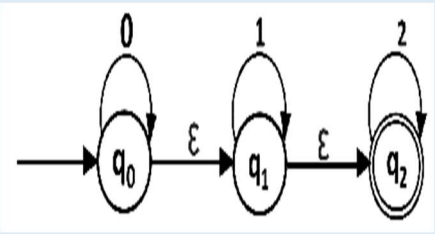
				Deterministic finite automata with epsilon to Deterministic finite automata	 i) Compute the Λ-closure of each state. ii) Convert the NFA-Λ to a DFA	er_5_10_Min								
01701349 4	05	05	136	Conversion from Non - Deterministic finite automata to Deterministic finite automata	Convert this NFA to FA 	Evaluating-Long_Answer_5_10_Min		4	Medium					
01701349 4	05	05	137	Conversion from Non - Deterministic finite automata with epsilon to Deterministic finite automata	Figure shows NFA-^. Draw an FA accepting the same language. 	Evaluating-Long_Answer_5_10_Min		5	Medium					

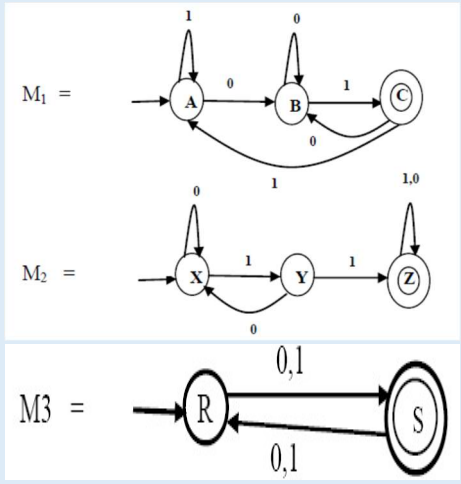
0170 1349 4	05	05	138	Conversion from Non - Deterministic finite automata to Determinstic finite automata	Convert the following NDFA to DFA. 	Evaluating-Long_Answer_5_10_Min		4	Hard					
0170 1349 4	05	05	139	Conversion from Non - Deterministic finite automata with epsilon to Determinstic finite automata	Convert the following NFA - Λ into its equivalent DFA that accepts the same language: 	Evaluating-Long_Answer_5_10_Min		5	Hard					
0170 1349 4	05	05	140	Conversion from Non - Deterministic finite automata with epsilon to Determi	Convert NFA- Λ to FA for following figure.	Evaluating-Long_Answer_5_10_Min		4	Medium					

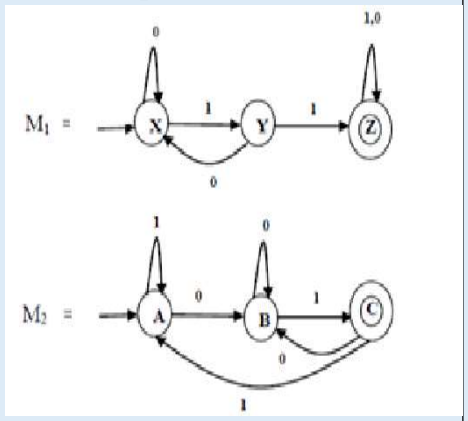
				nstic finite automata										
01701349 4	05	05	141	Conversion from Non - Deterministic finite automata to Deterministic finite automata	Convert the following NFA into its equivalent DFA 	Evaluating-Long_Answer_5_10_Min		5	Hard					
01701349 4	05	05	142	Conversion from Non - Deterministic finite automata to Deterministic finite automata	Convert the Given NFAwith null into its equivalent NFA 	Evaluating-Short_Answer_2_5_Min		4	Easy					
01701349 4	05	05	143	Conversion from Non - Determi	Convert the given NFA to FA.	Evaluating-Long_Answer_5_10_Min		4	Easy					

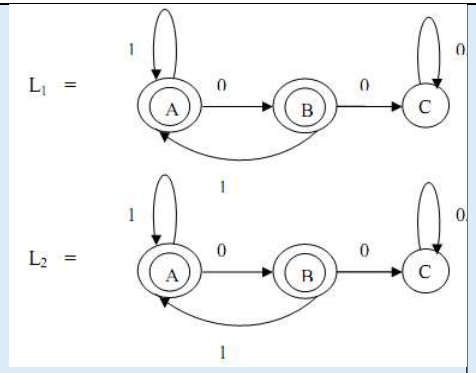
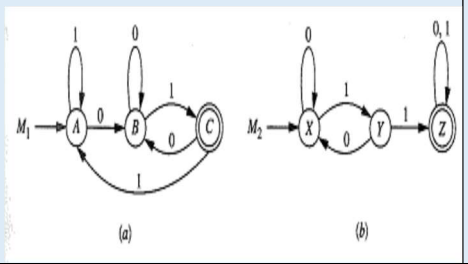
				nistic finite automata to Deterministic finite automata										
01701349 4	05	05	144	Conversion from Non - Deterministic finite automata with epsilon to Deterministic finite automata	Find Λ-Closure for each of the states in following NFA-Λ. And convert it into NFA and FA. q δ(q,a) δ(q,b) δ(q,Λ 1 ø ø {2} 2 {3} ø {5} 3 ø {4} ø 4 {4} ø {1} 5 ø {6,7} ø 6 {5} ø ø 7 ø ø {1}	Evaluating-Long_Answer_5_10_Min		5	Hard					
01701349 4	05	05	145	Conversion from Non - Deterministic finite automata with epsilon to Non-Deterministic finite	Convert the following ε -NFA into NFA. 	Evaluating-Long_Answer_5_10_Min		4	Medium					

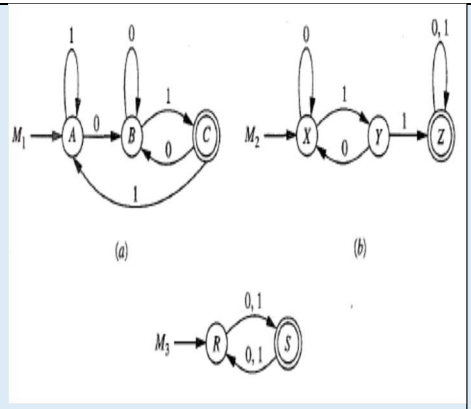
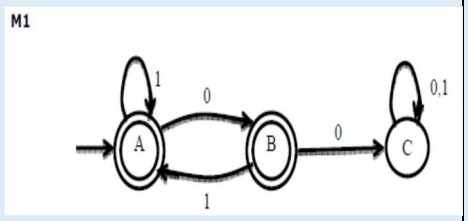
				automata										
01701349 4	05	05	146	Conversion from Non - Deterministic finite automata with null to Non - Deterministic finite automata	Convert NFA- Λ to NFA for following figure 	Evaluating-Long_Answer_5_10_Min		4	Hard					
01701349 4	05	05	147	Conversion from Non - Deterministic finite automata to Determinstic finite automata	Determine the equivalent DFA for the above given NFA. 	Understanding-Short_Answer_2_5_Min		3	Easy					
01701349 4	05	05	148	Conversion from Non - Deterministic finite automata with epsilon	Convert the NFA with ε into its equivalent DFA.	Evaluating-Long_Answer_5_10_Min		4	Medium					

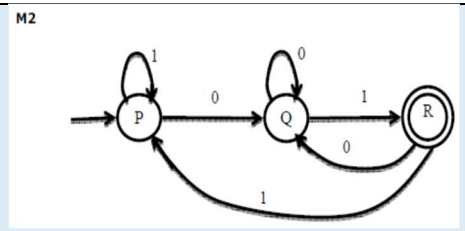
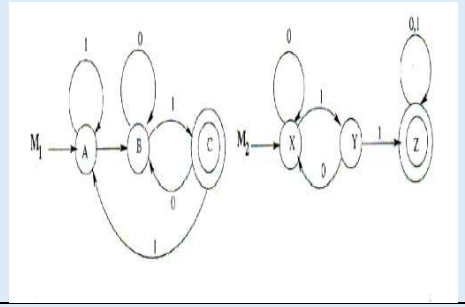
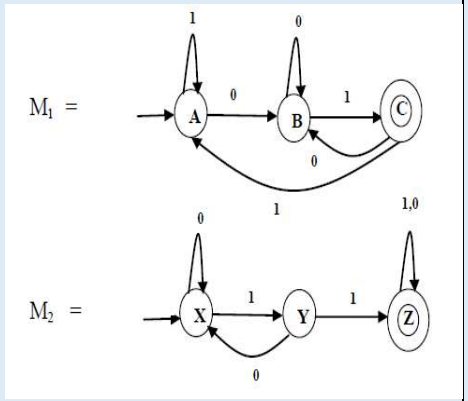
				to Deterministic finite automata										
01701349 4	05	05	149	Conversion from Non - Deterministic finite automata to Deterministic finite automata	Convert the given NFA into its equivalent DFA. 	Evaluating-Long_Answer_5_10_Min		4	Medium					
01701349 2	06	06	150	kleene's Theorem	Using kleene's Theorem Draw NFA-Λ for ((01)*10 + (00)*)*	Understanding-Short_Answer_2_5_Min		03	Medium					
01701349 2	06	06	151	kleene's Theorem	Using kleene's Theorem Draw NFA-Λ for ((0+1)*10 + (00)*)*	Understanding-Short_Answer_2_5_Min		03	Medium					
01701349 2	06	06	152	kleene's Theorem	Draw NFA recognizing the language ({0,1}*{10} U {00}*{11}*) * using kleene's theorem part 1, where Σ = {0,1}	Understanding-Short_Answer_2_5_Min		03	Medium					
01701349 2	06	06	153	kleene's Theorem	Using kleene's Theorem Draw NFA-Λ for ((0+1) (01)*)	Understanding-		03	Medium					

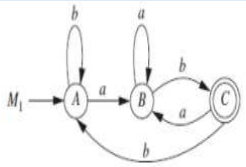
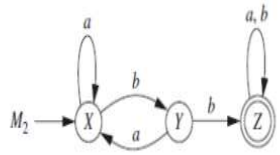
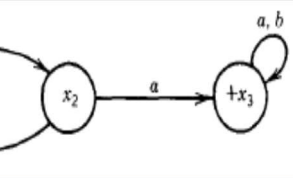
						Short_Answer_2_5_Min								
0170 1349 2	06	06	154	Union, Intersection, Difference of FA	Let M1, M2 and M3 be the FAs pictured in Figure, recognizing languages L1, L2 and L3, respectively.  Draw FAs recognizing the following languages. a. L1 U L2 b. L1 ∩ L3.	Evaluating-Long_Answer_5_10_Min		05	Hard					
0170 1349 2	06	06	155	Union, Intersection, Difference of FA	L1 is a language over {0, 1}* that accepts strings ending in 11. L2 is a language over {0, 1}* that accepts strings containing 101 as sub-string. Write the regular expressions, draw FA for L1 and L2 and derive FA for L1 U L2	Understanding-Short_Answer_2_5_Min		05	Hard					
0170 1349 2	06	06	156	Union, Intersection, Difference of FA	Draw FA for follow. □ L1 = {w | 00 is not substring of w} □ L2 = {w | w ends in 01} languages: Find FA accepting languages (i)L1 U L2 and (ii)L1 ∩ L2	Understanding-Short_Answer_2_5_Min		05	Medium					

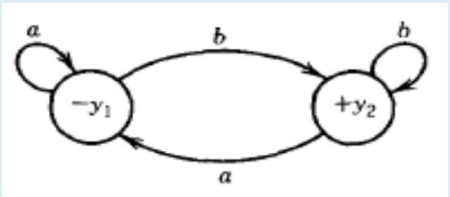
0170 1349 2	06	06	157	Union, Intersection, Difference of FA	Let M1 and M2 be the FAs pictured in Figure, recognizing languages L1 and L2 respectively.  Draw FAs recognizing the following languages. a. L1 U L2' b. L2 - L1	Evaluating-Long_Answer_5_10_Min		04	Medium					
0170 1349 2	06	06	158	Union, Intersection, Difference of FA	Suppose that Languages L1 and L2 are the subsets given below. Where Σ = { 0 , 1 } L1 = { x | 00 is not a substring of x } L2 = { x | x ends with 01 }Draw FAs recognizing the following languages (1) L1 - L2 (2) L1∩L2	Understanding-Short_Answer_2_5_Min		05	Medium					
0170 1349 2	06	06	159	Union, Intersection, Difference of FA	Suppose that L1 and L2 are the subsets:	Understanding-Short_Answer_2_5_Min		05	Medium					

					 Draw the Fas recognizing the following languages. L1 ∩ L2 and L1 – L2								
0170 1349 2	06	06	160	Union, Intersection, Difference of FA	Let M1 and M2 be the FA in fig below for the language L1 and L2, find L1 U L2 and L1 ∩ L2 and L2 – L1. 	Evaluating-Long_Answer_5_10_Min		04	Medium					
0170 1349 2	06	06	161	Union, Intersection, Difference of FA	Let M1, M2 and M3 be the FAs pictured in Figure below, recognizing languages L1, L2, and L3 respectively.	Understanding-Short_Answer_2_5_Min		05	Medium					

					 Draw FAs recognizing the following languages: i. L1 U L2 ii. L1 ∩ L2 iii. L1 - L2 iv. L1 ∩ L3 v. L3 - L2								
0170 1349 2	06	06	162	Union, Intersection, Difference of FA	There are 2 languages over Σ = {a , b} L1 = all strings with a double "a" L2 = all strings with an even number of "a" Find a regular expression and an FA that define L1∩ L2.	Understanding-Short_Answer_2_5_Min		05	Medium					
0170 1349 2	06	06	163	Union, Intersection, Difference of FA	Let M1 and M2 be the two FAs as given below. 	Evaluating-Long_Answer_5_10_Min		05	Medium					

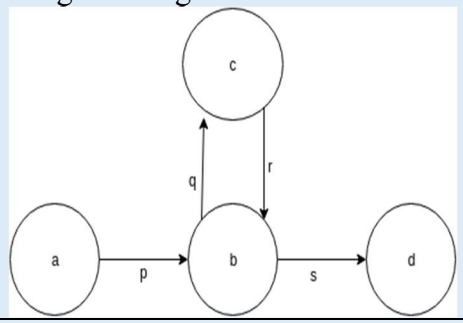
					 Draw FA recognizing (L1 υL2) and (L1-L2) where L1 and L2 correspond to M1 and M2 respectively.								
0170134902	06	06	164	Union, Intersection, Difference of FA	Fig. shows two DFAs M1 and M2, to accept languages L1 and L2, respectively. Determine DFAs to recognize L1 U L2. 	Understanding-Short_Answer_2_5_Min		04	Medium					
0170134902	06	06	165	Union, Intersection, Difference of FA	Let M1 and M2 be the FAs pictured below, recognizing languages L1 and L2 respectively 	Evaluating-Long_Answer_5_10_Min		04	Medium					

					Draw the FAs recognizing the following languages: $L1 \cap L2$, $L2 - L1$									
0170 1349 2	06	06	166	Union, Intersection, Difference of FA	L1 and L2 are two languages: L1 = {x | 11 is not a substring of x} L2 = {x | x starts with 0 and ends with 0} Draw FA for both L1 and L2 and construct FA for L3 = L2 - L1	Evaluating-Long_Answer_5_10_Min		04	Medium					
0170 1349 2	06	06	167	Union, Intersection, Difference of FA	Let M_1 and M_2 be the FAs pictured in Fig. (i) and Fig. (ii) accept the languages L_1 and L_2, respectively Fig. (i)  Fig. (ii)  Draw FAs accepting the following languages: (i) $L_1 \cup L_2$ (ii) L_2`	Understanding-Short_Answer_2_5_Min		04	Medium					
0170 1349 2	06	06	168	Union, Intersection, Difference of FA	Let FA_1 and FA_2 be the FAs as shown in the figure recognizing the languages L1 and L2 respectively. Draw an FA recognizing the language, L1 U L2. **FA_1:**  	Understanding-Short_Answer_2_5_Min		04	Medium					

					FA2: 									
0170 1349 2	06	06	169	Pumping Lemma	Define Pumping Lemma for Regular Languages. Use Pumping Lemma to show that the following languages are not regular. $L = \{ 0^n 1^{2n} \mid n > 0 \}$ $L = \{ ww^R \mid w \in \{0,1\}^* \}$	Understanding-Short_Answer_2_5_Min		04	Hard					
0170 1349 2	06	06	170	Pumping Lemma	Define Pumping Lemma for Regular Languages. Show that following language is not a Regular Language using Pumping Lemma $L = \{0^i 1^i \mid i >= 0 \}$, where $\Sigma = \{0,1\}$	Understanding-Short_Answer_2_5_Min		04	Medium					
0170 1349 2	06	06	171	Pumping Lemma	Prove that the language $L= \{a^n b^n a b^{n+1} \mid n=1,2,3,\ldots\}$ is nonregular using pumping lemma.	Understanding-Short_Answer_2_5_Min		04	Hard					
0170 1349 2	06	06	172	Pumping Lemma	Define pumping lemma and its application.	Understanding-Short_Answer_2_5_Min		04	Medium					
0170 1349 2	06	06	173	Pumping Lemma	Show that the language $L= \{a^n b^n c^n / n>=1\}$ is non-regular using pumping lemma theory.	Understanding-Short_Answer_2_5_Min		04	Hard					
0170 1349 2	06	06	174	Pumping Lemma	Show that the language L= {ww / w ∈{a,b}*} is not context free language using pumping lemma theory.	Understanding-Short_Answer_2_5_Min		04	Medium					

0170 1349 2	06	06	175	Pumping Lemma	Is the following set regular $\{0^{2n} \mid n >=1\}$ If yes, write down the corresponding regular expression. Else, prove that the language is not regular. **Answer:** Yes. (00)+	Understanding-Short_Answer_2_5_Min	Yes. (00)+	01	Medium					
0170 1349 2	06	06	176	Pumping Lemma	Use the pumping lemma to show that following language is not regular. L = {xy | x, y ϵ {0, 1}* and y is either x or x^r }**.[**	Understanding-Short_Answer_2_5_Min		03	Medium					
0170 1349 2	06	06	177	Pumping Lemma	Use the pumping lemma to show that following language is not regular: L = {ww|w ϵ {0,1}*}.	Understanding-Short_Answer_2_5_Min		04	Medium					
0170 1349 2	06	06	178	Pumping Lemma	What do you mean by Regular Language? Explain the application of the Pumping Lemma to show a Language is Regular or Not**.**	Understanding-Short_Answer_2_5_Min		03	Medium					
0170 1349 2	06	06	179	Pumping Lemma	Define Pumping Lemma for Regular Languages. Prove that the language L = {a^n: n is a prime number} is not regular.	Understanding-Short_Answer_2_5_Min		04	Medium					
0170 1349 2	06	06	180	Pumping Lemma	Define Pumping Lemma. Use the Pumping Lemma to show that the following languages are not regular: • L = { 0^n 1 0^{2n} / n ≥ 0 } • L = { 0^i 1^j 0^k / k > i+j }	Understanding-Short_Answer_2_5_Min		04	Hard					

0170 1349 2	06	06	181	Pumpin g Lemma	Use Pumping Lemma to show that L = {x Є {0,1}* | x is a palindrome} is not a regular language.	Understandi ng-Short_Answ er_2_5_Min		04	Medium					
0170 1349 2	06	06	182	Pumpin g Lemma	While applying Pumping lemma over a language, we consider a string w that belong to L and fragment it into _____ parts.	Understandi ng-Multiple_Ch oice	3	01	Easy		3	5	2	Non e of these
0170 1349 2	06	06	183	Pumpin g Lemma	If we select a string w such that w∈L, and w=xyz. Which of the following portions cannot be an empty string?	Understandi ng-Multiple_Ch oice	y	01	Easy		x	y	z	Non e of these
0170 1349 2	06	06	184	Pumpin g Lemma	Let w= xyz and y refers to the middle portion and |y|>0.What do we call the process of repeating y 0 or more times before checking that they still belong to the language L or not?	Understandi ng-Multiple_Ch oice	Pum ping	01	Easy		Gen erati ng	Pum ping	Prod ucin g	Non e of these
0170 1349 2	06	06	185	Pumpin g Lemma	here exists a language L. We define a string w such that w∈L and w=xyz and |w| >=n for some constant integer n.What can be the maximum length of the substring xy i.e. |xy|<=?	Understandi ng-Multiple_Ch oice	n	01	Easy		n	|y|	|x|	Non e of these
0170 1349 2	06	06	186	Pumpin g Lemma	Fill in the blank in terms of p, where p is the maximum string length in L. Statement: Finite languages trivially satisfy the pumping lemma by having n = _____	Understandi ng-Multiple_Ch oice	p+1	01	Easy		p*1	p+1	p-1	Non e of these
0170 1349 2	06	06	187	Pumpin g Lemma	Answer in accordance to the third and last statement in pumping lemma: For all _____ xy^iz ∈L	Understandi ng-Multiple_Ch oice	i>= 0	01	Easy		i>0	i<0	i<=0	Non e of these
0170 1349 2	06	06	188	Pumpin g Lemma	Which of the following one can relate to the given statement: Statement: If n items are put into	Understandi ng-	Pige on Hole	01	Easy		Pum ping	Pige on Hole	Coun t	Non e of these

					m containers, with n>m, then atleast one container must contain more than one item.	Multiple_Choice	principle				lemma	principle	principle	
01701349 2	06	06	189	Pumping Lemma	f d is a final state, which of the following is correct according to the given diagram? 	Understanding-Multiple_Choice	x=p, y=qr, z=s	01	Easy		x=p, y=qr, z=s	x=p, z=qrs	x=pr, y=r, z=s	None of these
01701349 2	06	06	190	Pumping Lemma	Relate the following statement: Statement: All sufficiently long words in a regular language can have a middle section of words repeated a number of times to produce a new word which also lies within the same language.	Understanding-Multiple_Choice	Pumping Lemma	01	Easy		Turing Machine	Pumping Lemma	Arden's theorem	None of these
01701349 2	06	06	191	Union, Intersection, Difference of FA	Regular sets are closed under union,concatenation and kleene closure.	Understanding-Multiple_Choice	True	01	Easy		True	False	Depends on regular set	None of these
01701349 2	06	06	192	Union, Intersection, Difference of FA	Explanation: Regular sets are closed under these three operation.	Understanding-Multiple_Choice	making final states non-final and non-final to final	01	Easy		making starting state as final state	no trival method	making final states non-final and non-final to final	None of these