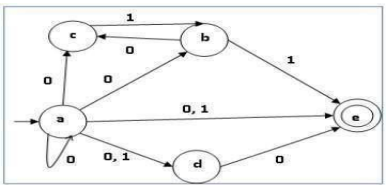
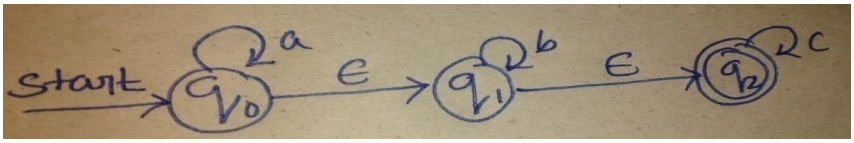
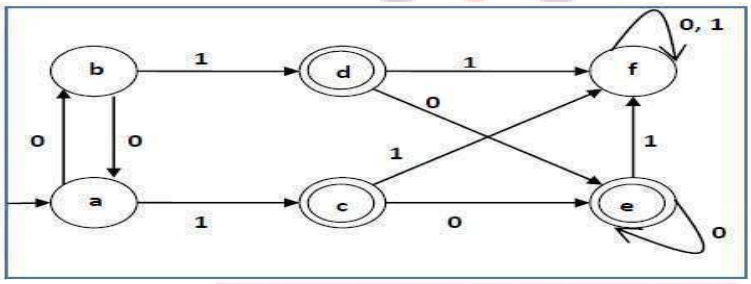
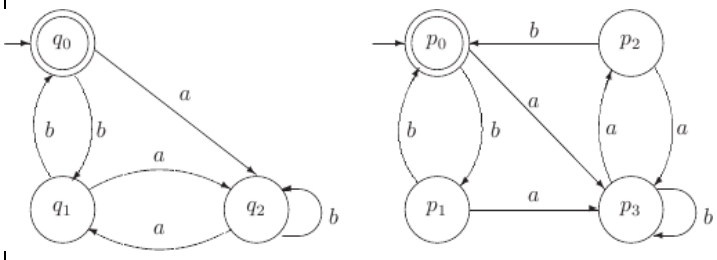
Department Of Computer Science and Engineering

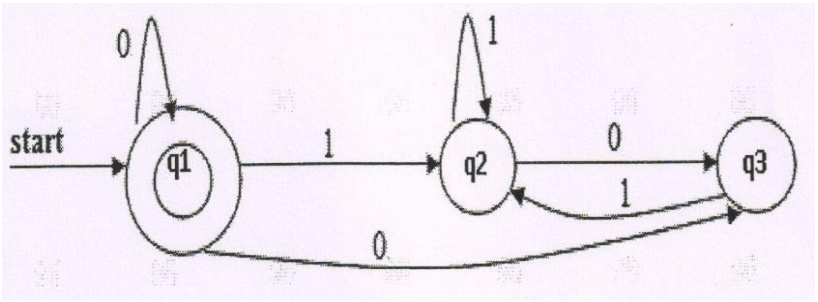
Unit Wise Question Bank

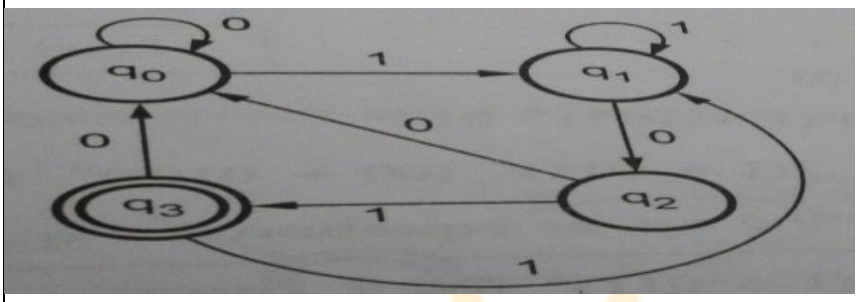
UNIT-I

S.No	Questions	BT	CO
	Part-A: Short Answer Questions		
1	Define DFA	L1	CO1
2	Mention the differences between DFA, NFA.	L4	CO1
3	Construct the DFA that accepts all strings of a's and b's , no a's are evenor no.of b's are even .	L1	CO1
4	Construct the FA that accepts all strings of a's and b's, that every stringstarts with a and length of the string not divisible by 3	L1	CO1
5	Write down the decision properties of FA.	L1	CO1
6	List the differences between Moore and Melay machines.	L1	CO1
7	Obtain a DFA to accept strings of a's and b's starting with the string ab	L1	CO1
8	List limitations of Finite Automata.	L1	CO1
9	Define Moore machine.	L1	CO1
10	Obtain a DFA to accept strings of a's and b's having even number of a'sand b's	L3	CO1
	Part – B Long Answer Questions		
11	Convert the following NFA to DFA 	L1	CO1

12	Convert the following NFA with ε to NFA without ε 		L1	CO1
13	A)	Define the following i). power of an String ii).Transition Table iii) Language iv) power set	L1	CO1
	B)	With the help of diagram explain the function of DFA, Why it is called as deterministic?	L1	CO1
14	A)	Draw a DFA to accept string of 0's and 1's ending with the string 011	L1	CO1
	B)	Obtain a DFA to accept strings of a's and b's having even number of a's and b's.	L2	CO1
15	A)	Minimize following DFA. 	L3	CO1
	B)	Check whether following two finite automata are equivalent or not. 	L1	CO1

UNIT–II

S.No		Questions	BT	CO
		Part-A: Short Answer Questions		
1		What is regular set and Regular Expression?	L4	CO2
2		Simplify the RE (ab*+(ab)*)*a*	L3	CO2
3		Construct the RE that generates all the strings of a's and b's i) including ε ii) excluding ε	L3	CO2
4		State Pumping lemma.	L1	CO2
5		Find a RE for the set of all strings containing no three consecutive 0'	L1	CO2
6		What is the difference between Regular and context free grammar?	L1	CO2
7		Construct a regular grammar for the regular expression a*b(a+b)*	L1	CO2
8		List out closure properties of regular languages.	L1	CO2
9		Prove for the RE a and b i.) (ab+a)*a=a(ba+a)* ii) (a*b*)*=(a+b)*	L1	CO2
10		List out the decision properties of regular languages	L1	CO2
		Part-B: Long Answer Questions		
11	a)	Show that L= { $a^n b^n$| n>=1} is not a regular language using pumpinglemma	L1	CO2
	b)	Derive the RE for the following finite automata 	L1	CO2
12	a)	Construct the RE , where the length of the string is at least 2 andexactly 2	L1	CO2
	b)	Convert the RE (02+1)* to an NFA-ε	L2	CO2

13	a)	State and prove pumping lemma for regular languages.	L1	CO2
	b)	Explain the procedure of converting FA to RE with example	L1	CO2
14		Explain Arden's theorem with example		
14	a)	consider the FA and construct RE that accept by the following diagram.  	L1	CO2
	b)	Find the RE accepted by the following DFA  	L1	CO2
15	a)	Prove That L = {a^p | p is a prime} is not regular?	L1	CO2
	b)	How to prove L{A^nB^n, n>=2} is non Regular.	L1	CO2

UNIT–III

S.No	Questions	BT	CO
	Part-A: Short Answer Questions		
1	Prove the grammar is ambiguous. S→a|Sa|bSS|SSb|SbS	L1	CO3
2	Define Parse tree	L1	CO3
3	Construct the PDA for the following grammar S→AA|a A→SA|b	L1	CO3
4	Define PDA?explain its ID?	L2	CO3
5	What are the difference between PDA and DPDA?	L1	CO3

6	Write the applications of CFG	L1	CO3
7	What is acceptance of final state and empty stack?	L1	CO3
8	Define the following terms i)Left most derivation ii)Right most derivation	L1	CO3
9	Define ambiguity in CFG with an Example.	L1	CO3
10	List out the properties of CFG?	L1	CO3
	Part-B: Long Answer Questions		
11	What are the steps required to convert from CFG to PDA ?	L2	CO3
12	Explain Right most derivation with an example	L1	CO3
13	How does the language is accepted by PDA? Explain with example.	L2	CO3
14	Design Push down Automata for the language $L = \{a_n b_{2n} \mid n \geq 1\}$.		
	Construct PDA for the Language **$L=\{a_n b_m c_n \mid n,m>=1\}$**		
15	Write a Context free grammar for the Language **$L=\{0_n 1_n \mid n>=1\}$**	L3	CO3

UNIT–IV

S.No	Questions	BT	CO
	Part-A: Short Answer Questions		
1	Explain Chomsky's normal form with example.	L1	CO4
2	Explain Greibach normal form with example.	L1	CO4
3	When a CFG is said to be GNF?	L2	CO4
4	Define Turing Machine?	L1	CO4
5	What is Type 1 grammar?	L1	CO4
6	Design TM for $L=\{0^n1^n0^n \mid n>=1\}$	L1	CO4
7	Construct TM to add two given integer?	L3	CO4
8	Explain TM ?its importance and limitations of TM?	L2	CO4
8	Make a comparison between FM,PDA and TM?	L2	CO4
9	What are the closure properties of CFL's?	L1	CO4

10		What is the statement of Pumping lemma in CFL?	L1	CO4
Part-B Long Answer Questions				
11		What are the applications of Pumping lemma in CFL?	L1	CO4
		Using Pumping lemma, prove that $L= \{a_i b_i c_i \mid i>=1\}$ is not a CFL.	L3	CO4
12		Eliminate Unit productions for the following grammar S→Aa / B B→A / bb A→a / bc / B	L3	CO4
13		Eliminate ε-productions for the following grammar S→AB A→aAA / ε B→bBB / ε	L3	CO4
15	a)	Given ∑ = { 0,1 }, design a TM that accepts the language denoted by regular expression 00*	L3	CO4
	b)	Design A TM that accepts L={anbn |n>=0}	L1	CO4
13	a)	Explain the following a) Closure properties of Context free languages b) Decision properties of Context free languages	L2	CO4
	b)	Convert the following grammar to Greibach normal form S→ ABA|AB|BA|AA|B, A→aA|a , B→bB|b	L3	CO4
14	a)	Explain with diagram for the the working of a TM model?	L1	CO4
	b)	Design a TM that accept L={02n1n|n>=0}	L1	CO4
15	a)	Consider the grammar S→ABC|BaB, A→aA|BaC|aaa, B→bbb|a|D, C→CA|AC, D→ε: a) Eliminate NULL productions b) Eliminate Unit Productions in the resulting grammar c) Eliminate Useless Symbols in the resulting grammar.	L1	CO4
	b)	Construct a TM for ∑={a,b} which will covert lower case to upper case letters.	L3	CO4
16	a)	What is Chomsky's normal form explain.?	L3	CO4
	b)	Define CNF . convert the following CFG to CNF S→ASB| ε , A→aAS|a , B→SbS|A|bb	L3	CO4

UNIT-V

S.No		Questions	BT	CO
1		What is PCB?	L2	CO5
2		State and explain rice theorem?	L2	CO5
3		Explain counter machine in details?	L5	CO5
4		Construct aTM for checking a given number is prime or not?	L2	CO5
5		What are the types of TM?	L5	CO5
6		What is halting problem is it solvable?	L2	CO5
7		Explain halting problem of TM?	L3	CO5
8		What is Decidability? Explain with example?	L2	CO5
9		Explain Universal TM?	L4	CO5
Part-B Long Answer Questions				
10		What are the properties of Recursive and recursivelyEnumerable language?	L5	CO5
11		Explain types of TM in detail.		
12	a)	Explain Post corresponding problem with an example.	L1	CO5
	b)	Explain i) Homomorphism ii) Recursive language	L2	CO5
13	a)	What is Turing Machine and Multi tape Turing Machine? Show that the languages accepted by these machines are same.	L2	CO5
	b)	What is decidability of a problem explain in details?	L1	CO5
14	a)	Design Turing Machine for the language to accept the set of strings with equal number of 0's and 1's and also give the instantaneous description for the input '110100'.	L1	CO5
	b)	What is halting problem and Turing reducibility?	L3	CO5
15	a)	Define LR (0) grammars.	L2	CO5
	b)	Give examples for Undecidable Problems	L1	CO5