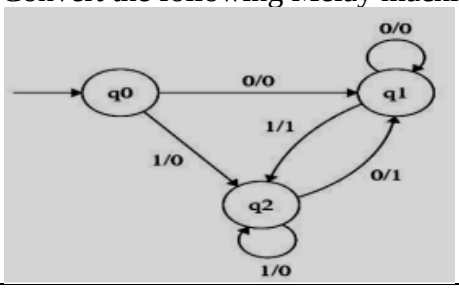
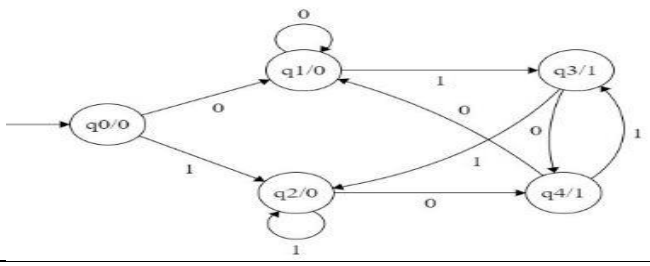
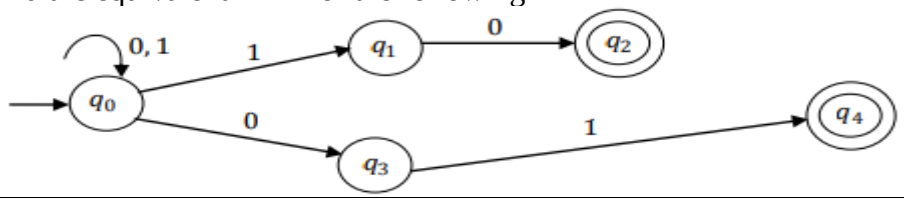
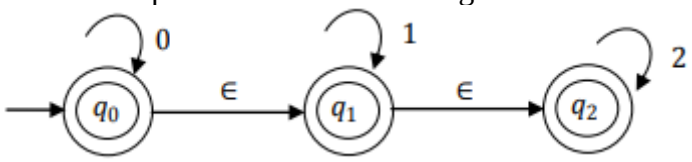
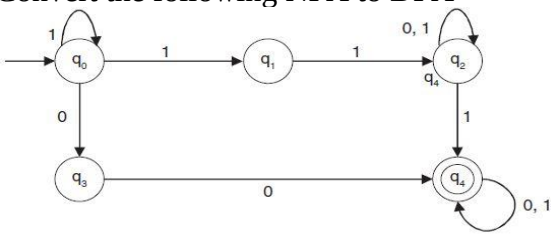
GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUA, Ananthapuramu)
(Accredited by NAAC with "A" Grade, NBA (EEE, ECE & ME) & ISO 9001:2008 Certified Institution)

QUESTIONBANK(DESCRIPTIVE)

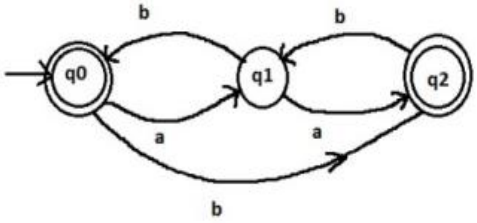
Subject Name with Code: Automata Theory & Compiler Design
Course & Branch: Year & Semester: III-I
Regulation: RG 22

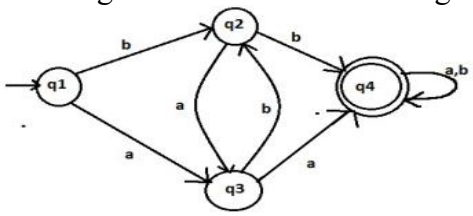
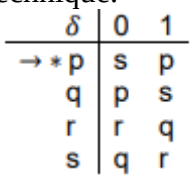
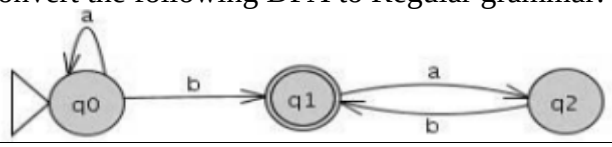
UNIT - I

S.No.	Question	[BT Level] [CO] [Marks]
	2 Marks Questions (Short)	
1.	Differentiate between a Moore machine and a mealy machine	L4, CO1,2M
2.	Define alphabet, string and language.	L1, CO1,2M
3.	Distinguish between DFA and NFA	L4, CO1,2M
4.	Define non-deterministic finite automata	L1, CO1,2M
5.	What are the applications of automata theory?	L2, CO1,2M
6.	Draw DFA that accepts strings ending a substring of 101 over an alphabet{0,1}	L3, CO1,2M
7.	Define a DFA formally	L1, CO1,2M
8.	Define ε-closure	L1, CO1,2M
9.	Construct a DFA that accepts binary strings that are divisible by 3.	L3, CO1,2M
10.	List methods for minimizing finite automata	L1, CO1,2M
	Descriptive Questions (Long)	
11.	Illustrate minimization of FA using Table filling method | | 0 | 1 | | -> q0 | q1 | q2 | | q1 | q3 | q4 | | q2 | q5 | q6 | | q3 | q3 | q4 | | q4 | q5 | q6 | | *q5 | q3 | q4 | | q6 | q5 | q6 |	L3,CO1,12M
12.	Convert the following Melay machine to Moore machine 	L3,CO1,12M
13.	convert given Moore machine into equivalent Mealy machine 	L3,CO1,12M
14.	(a)Explain DFA and NFA with differences.	L4,CO1,12M

	(b)Explain melay and moore machines with differences.	
15.	Give the formal definition of DFA and design a DFA to accept all decimal numbers divisible by 3 on Σ = {0, 1, … . . ,9}. Show the moves of DFA for strings 369 and 964	L3,CO1,12M
16.	Illustrate construction of DFA to accept binary string whose decimal equivalent is divisible by 5 and ∑ = {0, 1}*	L3,CO1,12M
17.	Find the equivalent DFA for the following NFA 	L3,CO1,12M
18.	Find DFA equivalent to the following NFA – ε 	L3,CO1,12M
19.	Convert the following NFA to DFA 	L3,CO1,12M
20.	Explain Central concepts of Automata Theory	L2,CO1,12M

UNIT - II

S.No.	Question	[BT Level] [CO] [Marks]
	2 Marks Questions (Short)	
1.	Define regular expression.	L1, CO2,2M
2.	Give the regular expression for the language all string over alphabet {0,1} containing at least two consecutive 0's.	L3, CO2,2M
3.	Write down the pumping lemma of regular sets.	L1, CO2,2M
4.	List any four closure properties of regular languages	L1, CO2,2M
5.	State Arden's theorem.	L1, CO2,2M
6.	Differentiate between left and right linear grammars	L4, CO2,2M
7.	Write a regular expression over the alphabet {0, 1} which starts with 0 and ends with 1.	L3, CO2,2M
8.	Define linear grammar.	L1, CO2,2M
9.	What are the applications of the regular expression?	L2, CO2,2M
10.	List any 2 identity rules. show $0^*+ 0^*11^* = 0^*1^*$	L1, CO2,2M
	Descriptive Questions (Long)	
11.	Find the regular expression corresponding to the following DFA. 	L3,CO2,12M

12.	Define regular expression. List and explain the closure properties of regular expression.	L2,CO2,12M
13.	Convert given finite automata to regular expression using Arden's theorem 	L3,CO2,12M
14.	State and prove Arden's theorem	L2,CO2,12M
15.	Convert the following DFA to a regular expression by state elimination technique. 	L3,CO2,12M
16.	Explain how equivalence between two FA is verified with an example	L2,CO2,12M
17.	Convert the following DFA to Regular grammar: 	L3,CO2,12M
18.	Convert given regular expression to finite automata using direct method [ab + (b + aa)b* a]	L3,CO2,12M
19.	State and prove Pumping Lemma for regular language and show $L = \{a^n b^{2n} \mid n > 0\}$ is not regular language	L2,CO2,12M
20.	Check whether the language $L = \{a^p$ /where p is prime$\}$ is regular or not	L5,CO2,12M

δ	0	1
→*p	s	p
q	p	s
r	r	q
s	q	r

UNIT - III

S.No.	Question	[BT Level] [CO] [Marks]
	2 Marks Questions (Short)	
1.	Explain left most and rightmost derivation for a string	L1, CO3,2M
2.	What is ambiguity in CFG? Give an example	L1, CO3,2M
3.	Define context free grammar. Give an example.	L1, CO3,2M
4.	What is left factoring in CFG? Give an example	L2, CO3,2M
5.	What are the applications of context free languages?	L2, CO3,2M
6.	What is left recursion in CFG? Give an example	L2, CO3,2M
7.	What is useless symbol in a grammar give an example?	L1, CO3,2M
8.	With an example, define parse tree of a grammar	L2, CO3,2M
9.	Consider the following context free grammar and construct the parse tree for the string 10011001: S → 0/1/0S0/1S1/∈.	L1, CO3,2M
10.	List closure properties of Context free grammar	L2, CO3,2M
	Descriptive Questions (Long)	
11.	Write about Chomsky hierarchy of languages	L2,CO3,12M
12.	Define parse tree. Write about leftmost derivation and rightmost derivation with example	L2,CO3,12M
13.	Convert the grammar G to Chomsky Normal form: G = ({S,A,B}, {a,b}, P,S) where P consist of the productions: S->bA/aB A->bAA/aS/a B->b/bS/aBB	L3,CO3,12M

14.	State and prove Pumping Lemma for context free language and show L= {a^n b^n c^n |n>=0} is not a context free language	L4,CO3,12M
15.	Define context free grammar. List and explain the closure properties of context free languages.	L2,CO3,12M
16.	Explain Left recursion and left factoring with example	L2,CO3,12M
17.	eliminate all ε - productions from the following grammar: S → ABCa/bD, A → BC/|b, B → b/ε, C → c/ε, D → d	L3,CO3,12M
18.	Eliminate useless production from the grammar given below. $S \rightarrow aS\|A\|C \quad A \rightarrow a \quad B \rightarrow aa \quad C \rightarrow aC$b.	L3,CO3,12M
19.	Define parse tree. Write about leftmost derivation and rightmost derivation with example	L3,CO3,12M
20.	What is ambiguous CFG? Check whether the following grammar is ambiguous or not for string abababa. $S \rightarrow SbS/a$	L4,CO3,12M

UNIT - IV

S.No.	Question	[BT Level] [CO] [Marks]
	2 Marks Questions (Short)	
1.	What is Compiler?	L2, CO4,2M
2.	Define phase and pass.	L1, CO4,2M
3.	List phases of Compiler	L1, CO4,2M
4.	What is a cross compiler?	L1, CO4,2M
5.	Differentiate between compiler and interpreter.	L4, CO4,2M
6.	Explain about sentinels	L2, CO4,2M
7.	Explain role of input buffering	L2, CO4,2M
8.	Explain Lex tool	L2, CO4,2M
9.	Explain Lexeme, Token and Pattern	L2, CO4,2M
10.	Explain Role of Lexical analyzer	L2, CO4,2M
	Descriptive Questions (Long)	
11.	Explain in detail about the phases of a compiler.	L2,CO4,12M
12.	Explain about input buffering.	L2,CO4,12M
13.	Write short notes on specification and recognition of tokens.	L2,CO4,12M
14.	What are a transition diagrams? Show the transition diagram for relational operators and numbers	L3,CO4,12M
15.	Discuss in brief about LEX tool.	L2,CO4,12M
16.	Explain about Design of Lexical Analyzer Generator	L2,CO4,12M
17.	(a)Explain Role of lexical analyzer (b) Why syntax analysis is separated from lexical Analysis?	L2,CO4,12M
18.	(a) Explain Regular expression (b) Explain Regular definition	L2,CO4,12M
19.	What are the compiler constructor tools? Explain in detail.	L4,CO4,12M
20.	Define Compiler and Interpreter? Differentiate between compiler and interpreter.	L4,CO4,12M

UNIT - V

S.No.	Question	[BT Level] [CO] [Marks]
	2 Marks Questions (Short)	
1.	Give the role of parser.	L1, CO5,2M
2.	Write a short note on LR parsing.	L1, CO5,2M
3.	What is Augmented Grammer?	L2, CO5,2M
4.	Write the different rules for computing the First ().	L1, CO5,2M
5.	Explain Recursive Predictive Parsing?	L2, CO5,2M
6.	What is YACC stands for? What is its role?	L2, CO5,2M
7.	Differentiate between S-attribute SDDs and L-attribute SDDs.	L2, CO6,2M
8.	List different types of Three Address Code?	L1, CO6,2M
9.	Explain Dead code elimination	L2, CO6,2M
10.	List various issues in code generator	L1, CO6,2M
	Descriptive Questions (Long)	
11.	Construct LALR parsing for the following grammar: S→ CC C→ cC/d	L3,CO5,12M
12.	Explain LR Parser with diagram	L2,CO5,12M
13.	Construct SLR parsing table for the following grammar: E → E + T/T T → T * F/F F → (E)/a Show the moves of the parser for parsing the string a * a + a.	L3,CO5,12M
14.	Explain the non-recursive predictive parsing with diagram	L2,CO5,12M
15.	Check the following grammar is LL(1) or not? E → E + T/T T → T * F/F F → (E)/a	L5,CO5,12M
16.	Explain types of Three Address code with example	L2,CO6,12M
17.	Write inherited attributes and synthesized attributes	L2,CO6,12M
18.	Explain Function preserving transformations	L2,CO6,12M
19.	Explain Peephole Optimization	L2,CO6,12M
20.	Explain about various issues in code generator	L2,CO6,12M

Signature of the Staff:

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Signature of Department Academic Committee Member 2:

Signature of Department Academic Committee Member 3: