

Program: BE Information Technology Engineering

Curriculum Scheme: Revised 2012

Examination: Second Year Semester IV

Course Code: SEITC 404

Course Name: AUTOMATA THEORY

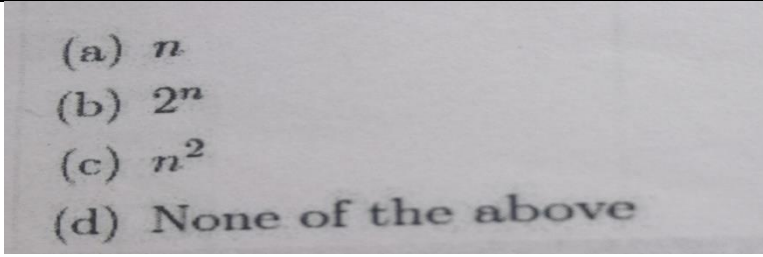
Time: 1-hour

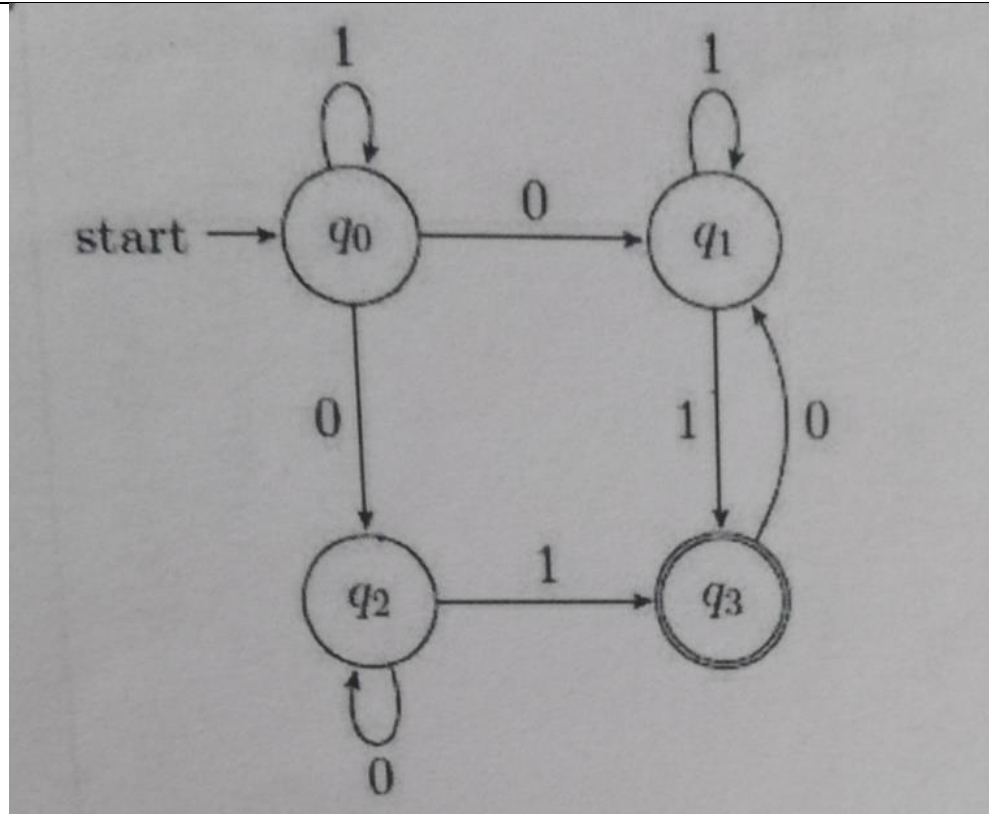
Max. Marks: 50

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Note to the students: - All the Questions are compulsory and carry equal marks.

Q1.	Which of the following is not a finite automata?
Option A:	NFA
Option B:	DFA
Option C:	Epsilon -NFA
Option D:	TFA
Q2.	<p>The given DFA accepts which of the following:</p> <pre> graph LR start((start)) --> q0((q0)) q0 -- 1 --> q1(((q1))) q0 -- 0 --> q2((q2)) q1 -- "0, 1" --> q1 q2 -- "0, 1" --> q2 </pre>
Option A:	All Strings starting with 1
Option B:	All Strings ending with 1
Option C:	All Strings starting with 0
Option D:	All Strings ending with 0
Q3.	_____ is the class of decision problems that can be solved by non-deterministic polynomial algorithms?
Option A:	NP
Option B:	P
Option C:	Hard
Option D:	Complete
Q4.	Given an NFA with n states, the minimum number of states in equivalent DFA is

	 <p>(a) n (b) 2^n (c) n^2 (d) None of the above</p>
Option A:	(a)
Option B:	(b)
Option C:	(c)
Option D:	(d)
Q5.	Push down automata accept _____ languages.
Option A:	Type 3
Option B:	Type 2
Option C:	Type 1
Option D:	Type 0
Q6.	Which of the following is not a part of the context free grammar?
Option A:	End symbol
Option B:	Start symbol
Option C:	Variable
Option D:	Production
Q7.	Which of the following turning machine does not perform?
Option A:	Copying the string
Option B:	Deleting a symbol
Option C:	Accepting language
Option D:	Inserting symbol
Q8.	How many steps are required to prove that a decision problem is NP complete?
Option A:	1
Option B:	2
Option C:	3
Option D:	4
Q9.	Which string is not accepted by given NFA



Option A: 1000101

Option B: 111010111

Option C: 1100001

Option D: 1000110

Q10. Which of the following statements is correct?

Option A: The intersection of two regular language is a regular language

Option B: The complement of two regular language is never a regular language

Option C: The union of two regular language is not necessarily a regular language

Option D: None of this

Q11. Which of the following is true?

Option A: Every subset of a regular set is regular

Option B: Every finite subset of a non-regular set is regular

Option C: The union of two non-regular set is not regular

Option D: Infinite union of finite sets is regular

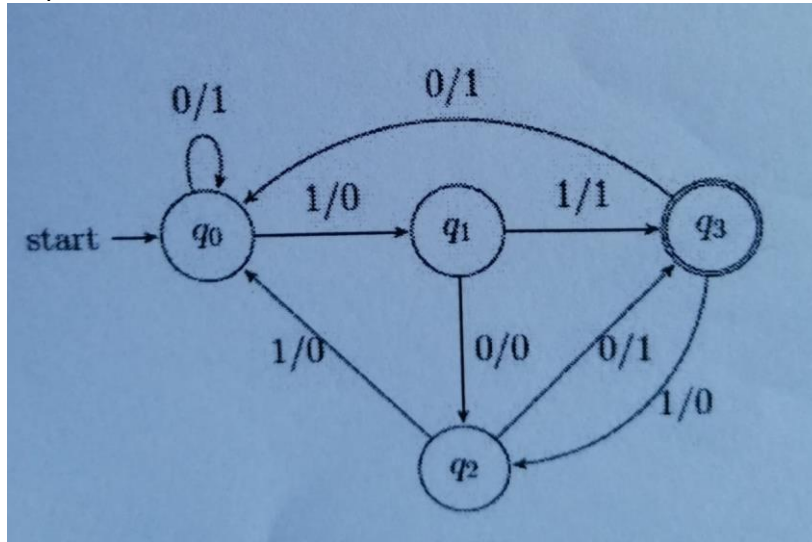
Q12. Which regular expression denotes the language consisting of 0's and 1's that start with 01 and end with 0?

	<p>(a) $(01(0 + 1)^*0)^*$ (b) $01(10)^*0$ (c) $(01)^*(0 + 1)0^*$ (d) $01(0 + 1)^*0$</p>
Option A:	(a)
Option B:	(b)
Option C:	(c)
Option D:	(d)
Q13.	<p>If $L_1 = \{a^n n \geq 0\}$ and $L_2 = \{b^n n \geq 0\}$ consider</p> <p>I $L_1 \cdot L_2$ is a regular language II $L_1 \cdot L_2 = \{a^n b^n n \geq 0\}$</p> <p>Which of the following is true?</p>
Option A:	Only I
Option B:	Only II
Option C:	Only I and II
Option D:	Neither I nor II
Q14.	<p>Which of the following statement(s) are true?</p> <p>I: Every left recursive grammar can be converted to a right recursive grammar and vice-versa II: All Epsilon productions can be removed from any context-free grammar by suitable transformations III: The derivation trees of strings generated by a context-free grammar in Chomsky Normal Form are always binary trees</p>
Option A:	I, II & III
Option B:	II & III
Option C:	I & III
Option D:	III
Q15.	Let G be a CNF. To derive a string of terminals of length x, the number of productions to be used is
Option A:	2x-1
Option B:	2x

Option C:	$2x+1$
Option D:	2 power of x
Q16.	Every grammar in Chomsky Normal Form is
Option A:	Context free
Option B:	Regular
Option C:	Context sensitive
Option D:	Recursive
Q17.	<p>Given grammar-</p> <p>G: (1)$S \rightarrow AS$ (2)$S \rightarrow AAS$ (3)$A \rightarrow SA$ (4)$A \rightarrow aa$</p> <p>Which of the following productions denies the format of CNF?</p>
Option A:	2,4
Option B:	1,3
Option C:	1,2,3,4
Option D:	2,3,4
Q18.	Push down automata uses which data structure?
Option A:	Queue
Option B:	Linked List
Option C:	Stack
Option D:	Array
Q19.	<p>With reference to the process of conversion of a context free grammar to CNF, the number of variables to be introduced for the terminals are:</p> <p>$S \rightarrow Ba$ $A \rightarrow aab$ $B \rightarrow Ac$</p>
Option A:	3
Option B:	4
Option C:	2
Option D:	5

Q20.

For the given Mealy machine, what is the output sequence for the input sequence 01001?



Option A: 10011

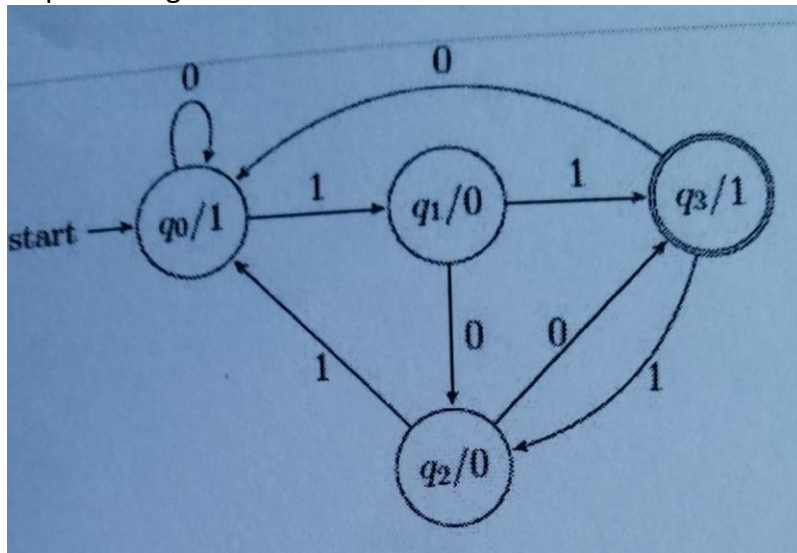
Option B: 10010

Option C: 10001

Option D: 10000

Q21.

For a given Moore machine, to produce output sequence 11101, which input sequence is given



Option A: 01110

Option B: 00111

Option C: 11101

Option D: None of above

Q22. Which statement is false?

Option A: Output of Moore machine depends on state only

Option B: Output of mealy machine depends on transition state only

Option C:	DFA is a Moore machine
Option D:	Moore machine can be converted to Mealy and vice versa
Q23.	Which of the following can accept even palindrome over {a,b}
Option A:	Push down Automata
Option B:	Turing machine
Option C:	N DFA
Option D:	Deterministic PDA
Q24.	According to Chomsky hierarchy, which of the following is adopted by Recursively Enumerable language?
Option A:	Type 0
Option B:	Type 1
Option C:	Type 2
Option D:	Type 3
Q25.	The value of n if Turing machine is defined using n-tuples:
Option A:	6
Option B:	7
Option C:	8
Option D:	5