

NADAR SARASWATHI COLLEGE OF ENGINEERING AND TECHNOLOGY, THENI.

Course/Branch : BE / CSE	Year / Semester : III / V	Format No.	NAC/TLP-07a.13
Subject Code : CS8501	Subject Name : Theory of Computation	Rev. No.	02
Unit No : I	Unit Name : Automata Fundamentals	Date	08.10.2020

OBJECTIVE TYPE QUESTION BANK

S. No.	Objective Questions (MCQ /True or False / Fill up with Choices)	BTL
1.	<p>Consider the following Finite State Automaton. The language accepted by this automaton is given by the regular expression</p> <p>A) $b^*ab^*ab^*ab^*$ B) $(a+b)^*$ C) $b^*ab^*ab^*$ D) $b^*a(a+b)^*$</p>	L3
2.	<p>Basic limitation of FSM is that it</p> <p>A) Cannot remember arbitrary large amount of information B) Sometimes fails to recognize grammars that are regular C) Sometimes recognizes grammars are not regular D) None of these</p>	L2
3.	<p>The concept of FA is much used in this part of compiler</p> <p>A) Code Generation B) Parser C) Lexical Analysis D) Code Optimization</p>	L2
4.	<p>Two finite state machines are said to be equivalent if they:</p> <p>A) Have the same number of states B) Recognize the same set of tokens C) Have the same number of states and edges D) Have the same number of edges</p>	L2
5.	<p>Let L be a set accepted by a nondeterministic finite automaton. The number of states in non-deterministic finite automaton is Q. The maximum number of states in equivalent finite automaton that accepts L is</p> <p>A) $2 Q$ B) 2 raise to power $Q + 1$ C) 2 raise to power Q D) Q</p>	L2

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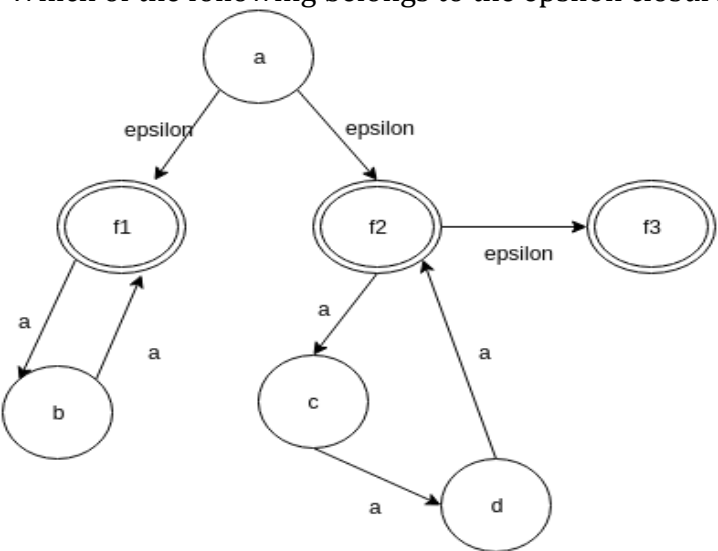
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6.	The part of an FA, where the input string is placed before it is run, is called A) State B) Input Tape C) Transition D) Output Tape	L1
7.	One language can be expressed by more than one FA". This statement is A) False B) True C) Sometimes true & sometimes false D) None of the mentioned	L2
8.	The word 'formal' in formal languages means A) The symbols used have well defined meaning B) They are unnecessary, in reality C) Only the form of the string of symbols is significant D) None of these	L2
9.	The addressing mode/s, which uses the PC instead of a general purpose register is ____ A) No B) Yes C) Sometimes D) Depends on NDFA	L2
10.	An automaton that presents output based on previous state or current input: A) Acceptor B) Classifier C) Transducer D) None of the mentioned.	L2
11.	The finite state machine given in figure below recognizes: A) Any string of odd number of a's and odd number of b's B) Any string of even number of a's and odd number of b's C) Any string of odd number of a's D) Any string of odd number of b's	L3
12.	Which of the following is an application of Finite Automaton? A) Compiler Design B) Grammar Parsers C) Text Search D) All of the mentioned	L2

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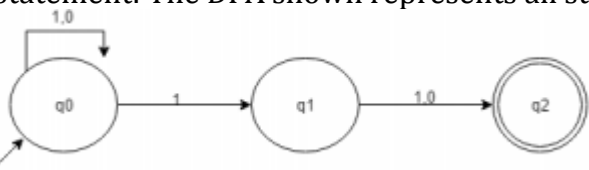
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13.	<p>Predict the number of transitions required to automate the following language. $L = \{w \mid w \text{ ends with } 00\}$ A) 3 B) 2 C) 4 D) Cannot be said</p>	L3
14.	<p>The total number of states to build the given language using DFA: $L = \{w \mid w \text{ has exactly 2 a's and at least 2 b's}\}$ A) 10 B) 11 C) 12 D) 13</p>	L3
15.	<p>For NFA with ϵ-moves, which among the following is correct? A) $\delta: Q \times (\Sigma \cup \{\epsilon\}) \rightarrow P(Q)$ B) $\delta: Q \times \Sigma \rightarrow P(Q)$ C) $\delta: Q \times \Sigma^* \rightarrow P(Q)$ D) All of the mentioned</p>	L2
16.	<p>ϵ-transitions are A) conditional B) unconditional C) input dependent D) none of the mentioned</p>	L2
17.	<p>Which of the following belongs to the epsilon closure set of a?</p>  <p>A) {f1, f2, f3} B) {a, f1, f2, f3} C) {f1, f2} D) none of the mentioned</p>	L3

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18.	<p>We can represent one language in more one FSMs, true or false?</p> <p>A) TRUE B) FALSE C) May be true D) Cannot be said</p>	L1
19.	<p>Choose the correct option for the given statement: Statement: The DFA shown represents all strings which has 1 at second last position.</p>  <p>A) Correct B) Incorrect, Incomplete DFA C) Wrong proposition D) May be correct</p>	L3
20.	<p>Which of the following options is correct? Statement 1: Initial State of NFA is Initial State of DFA. Statement 2: The final state of DFA will be every combination of final state of NFA.</p> <p>A) Statement 1 is true and Statement 2 is true B) Statement 1 is true and Statement 2 is false C) Statement 1 can be true and Statement 2 is true D) Statement 1 is false and Statement 2 is also false</p>	L2
21.	<p>NFA, in its name has 'non-deterministic' because of :</p> <p>B) The choice of path is non-deterministic C) The state to be transited next is non-deterministic D) All of the mentioned</p>	L2
22.	<p>The construction time for DFA from an equivalent NFA (m number of node)is:</p> <p>A) $O(m^2)$ B) $O(2^m)$ C) $O(m)$ D) $O(\log m)$</p>	L2
23.	<p>If n is the length of Input string and m is the number of nodes, the running time of DFA is x that of NFA.Find x?</p> <p>A) $1/m^2$ B) 2^m C) $1/m$ D) $\log m$</p>	L2

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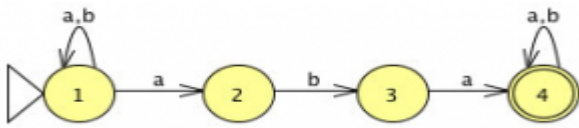
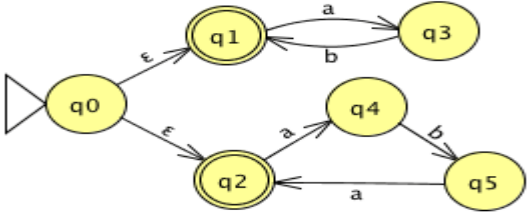
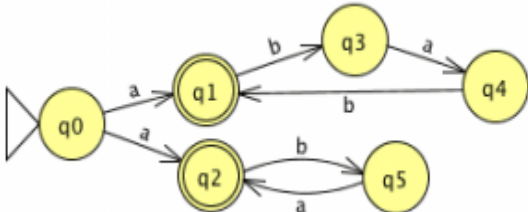
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24.	Which of the following option is correct? A) NFA is slower to process and its representation uses more memory than DFA B) DFA is faster to process and its representation uses less memory than NFA C) NFA is slower to process and its representation uses less memory than DFA D) DFA is slower to process and its representation uses less memory than NFA	L2
25.	There are _____ tuples in finite state machine. A) 4 B) 5 C) 6 D) unlimited	L2
26.	Transition function maps. A) $\Sigma^* Q \rightarrow \Sigma$ B) $Q^* Q \rightarrow \Sigma$ C) $\Sigma^* \Sigma \rightarrow Q$ D) $Q^* \Sigma \rightarrow Q$	L2
27.	Number of states require to accept string ends with 10. A) 3 B) 2 C) 1 D) can't be represented.	L2
28.	Languages of a automata is A) If it is accepted by automata B) If it halts C) If automata touch final state in its life time D) All language are language of automata	L3
29.	Language of finite automata is. A) Type 0 B) Type 1 C) Type 2 D) Type 3	L1
30.	Finite automata requires minimum _____ number of stacks. A) 1 B) 0 C) 2 D) None of the mentioned	L1
31.	How many DFA's exits with two states over input alphabet {0,1} ? A) 16 B) 26 C) 32 D) 64	L2

Note: Number of DFA's = $2^n * n^{(2^n)}$

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32.	<p>The basic limitation of finite automata is that</p> <p>A) It can't remember arbitrary large amount of information.</p> <p>B) It sometimes recognize grammar that are not regular.</p> <p>C) It sometimes fails to recognize regular grammar.</p> <p>D) All of the mentioned</p>	L2
33.	<p>FSM with output capability can be used to add two given integer in binary representation. This is</p> <p>a) True</p> <p>b) False</p> <p>c) May be true</p> <p>d) None of the mentioned</p>	L2
34.	<p>Finite state machine are not able to recognize Palindromes because:</p> <p>A) Finite automata cannot deterministically find the midpoint</p> <p>B) Finite automata cannot remember arbitrarily large amount of data</p> <p>C) Even if the mid-point is known, it cannot find whether the second half matches the first</p> <p>D) All of the mentioned</p>	L2
35.	<p>Construct a N DFA for the following regular expression $(aUb)^*aba(aUb)^*$</p> <p>A) </p> <p>B) </p> <p>C) </p> <p>D) None of the mentioned</p>	L3

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36.	<p>δ tells us the best:</p> <p>A) how the DFA S behaves on a word w</p> <p>B) the state is the dumping state</p> <p>C) the final state has been reached</p> <p>D) Kleene operation is performed on the set</p>	L1
37.	<p>The sum of minimum and maximum number of final states for a DFA n states is equal to:</p> <p>A) n+1</p> <p>B) n</p> <p>C) n-1</p> <p>D) n+2</p>	L2
38.	<p>The following Finite automaton recognizes which of the given languages?</p> <p>A) $\{1,0\}^*\{01\}$</p> <p>B) $\{1,0\}^*\{1\}$</p> <p>C) $\{1\} \{1,0\}^*\{1\}$</p> <p>D) $1^*0^*\{0,1\}$</p>	L3
39.	<p>An FSM can be a</p> <p>A) Of finite tape length, rewinding capability and unidirectional tape movement</p> <p>B) Of finite tape length, without rewinding capability and unidirectional tape movement</p> <p>C) Of finite tape length, without rewinding capability and bidirectional tape movement</p> <p>D) Of finite tape length, rewinding capability and bidirectional tape movement</p>	L2
40.	<p>The number of states required by a Finite state machine, to simulate the behavior of a computer with a memory capable of storing 'm' words, each of length 'n' bit is?</p> <p>A) $m \times 2^n$</p> <p>B) 2^{m+n}</p> <p>C) 2^{mn}</p> <p>D) $m+n$</p>	L2