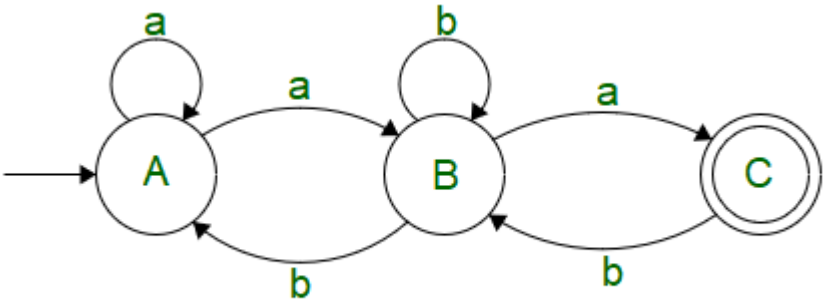
K. J. Somaiya College of Engineering, Mumbai-77
(Autonomous College Affiliated to University of Mumbai)
Semester: **January –May 2021**
In-Semester Examination

Class: SY/TY/LY B. Tech
Branch: Computer **Semester: IV**
Full name of the course: Theory of Automata with Compiler Design **Course Code:2UCC404**
Duration: 1hr.15 min (attempting questions) **Max. Marks: 30**
+15 min (uploading)

Q. No	Questions	Marks
Q1	1. How many strings of length less than 4 contains the language described by the regular expression (x+y)*y(a+ab)*? a) 7 b) 10 c) 12 d) 11 2. Regular expression are a) Type 0 language b) Type 1 language c) Type 2 language d) Type 3 language 3. A regular language over an alphabet a is one that can be obtained from a) union b) concatenation c) kleen Closure d) All of the mentioned 4. Given: L1= {xϵ ∑*|x contains even no's of 0's} L2= {xϵ ∑*|x contains odd no's of 1's} No of final states in Language L1 U L2? a) 1 b) 2 c) 3 d) 4 5. The sum of minimum and maximum number of final states for a DFA n states is equal to: a) n+1 b) n c) n-1 d) n+2 6. Pumping lemma for regular grammar is used to prove that the given language is :	10 marks (1 mark each)

	a. Regular b. Not Regular c. Ambiguous d. Incomplete 7. Which of the following is not a part of the FA with output? a. States b. Alphabets c. Final States d. Starting States 8. Finite Automata with epsilon Transitions is always of Non deterministic type. a. TRUE b. FALSE 9. Which of the following is not correct? a. a*=aa+ b. (a+b)*=(a*b*)* c. a*+b*=(a+b)* d. a+a*=a* 10. In NFA (Q, Σ , δ , q0, F), transition function δ (q1,a) = A, where A is a set and q1 $\in$ Q. The maximum cardinality of A could be: a. 1 b. n c. 2*n d. 2^n where |Q|=n	
Q2	Design DFA for the language over {a,b}* with strings beginning with aba and not ending in ba. Simulate the string for " ababaa"	10 marks (6+4)
Q3	a. Find the Regular Expression of the given Finite Automata using Arden;s Theorem-  b. Give the difference between – I. NFA and DFA II. Mealy and Moore Machine	5 marks 5 marks (2+3)

	OR	
	a. Give different operators used in regular expressions. Write Regular Expressions for the given language:	5 marks (1+2+2)
	I. Language over {a,b} with a's in multiple of three and b's in any numbers.	
	II. Binary language starting and ending with different symbols and having strings of even length.	
	b. Construct Mealy Machine for the Binary language to generate output "e" for every even numbered 0. Convert that machine into equivalent Moore Machine.	5 marks (2+3)