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PES University, Bangalore

UE19CS205

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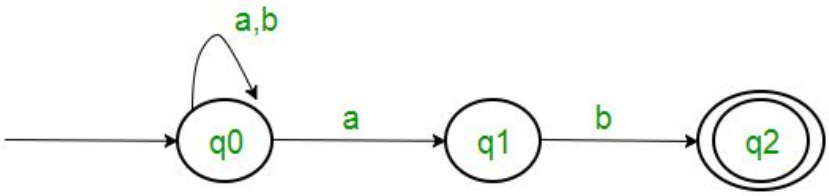
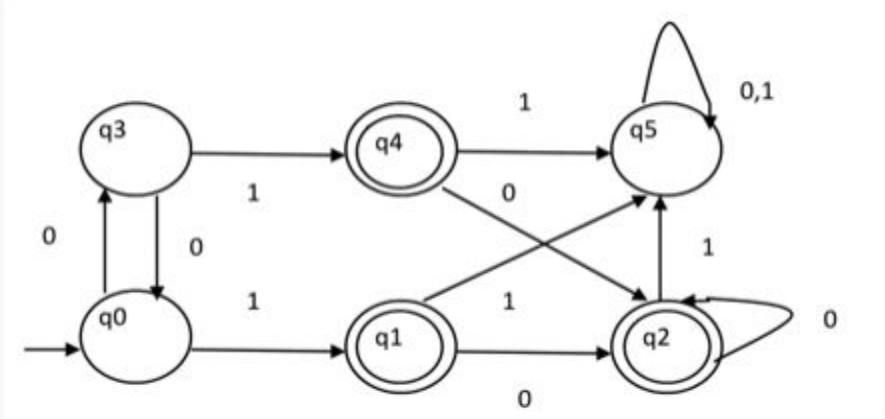
SAMPLE PAPER FOR

IN SEMESTER ASSESSMENT (ISA-1)- B.TECH III SEMESTER
October, 2020

Automata Formal Languages & Logic

Time: 2 Hrs **Answer All Questions** **Max Marks: 60**

1.	a)	Construct a DFA accepting a set of strings over {a, b} in which the second symbol from the left-hand side is always 'b'.	4
	b)	Convert the following NFA to its equivalent DFA using subset construction method  .	6
2	a)	Construct a DFA accepting set of strings over {a, b} in which every 'a' is never followed by 'bb'.	4
	b)	Convert the given DFA to its equivalent DFA with a minimum number of states using table filling algorithm.  	6

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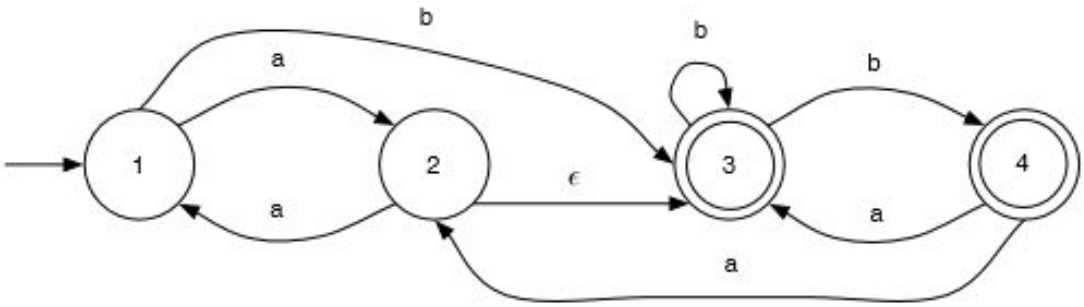
3.	a)	Construct a regular expression for the following languages i) L = {w | w Ɛ {a, b}* and w has exactly one pair of consecutive a's} ii) L = {anbm | n, m are two integers such that (n+m) is even}, Σ = {a, b}	4
	b)	Obtain Regular Expression for the following automata using state elimination technique. The removal of the states should be in ascending order of their names (s.t. 1,2,3,4)  	6
4.	a	State and prove the pumping lemma for the regular languages.	5
	b	Prove that family of regular languages are closed under union and concatenation operations	5
5.	a	Obtain a CFG for the language L={ $a^n b^m c^k$: n,m,k>=0 and m=n+k}	4
	b	Construct a PDA for the language L={ $a^n b^m c^k$: n,m,k>=0 and n=m+k}	6
6.	a	Check whether the following grammar G is ambiguous or not. If it is ambiguous then obtain an unambiguous grammar which accepts the same language. S-> AB | aaB A→ aA | a B→ b	4
	b	Convert the following grammar into Chomsky Normal Form S → a | aA | B. A → aBB | λ B → Aa | b	6

Acknowledgement : The sample paper is prepared by Dr. Pooja Agarwal and Dr. Karthik S.