SSN COLLEGE OF ENGINEERING, KALAVAKKAM – 603 110
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
B.E. Computer Science and Engineering
CS6503 THEORY OF COMPUTATION

Date: 21.07.2017, 8.00-9.30 AM **UNIT TEST – 1** **Max. Marks: 50**
Academic Year: 2017-2018 ODD **Batch: 2015-2019**
Semester: 5 **Faculty: Dr. S. Kavitha / Ms. A. Beulah**

Qn. No	Part – A (Answer any FIVE) (5 x 2 = 10)	Marks	(KL,COn)
1	Define Deterministic Finite Automat (DFA).	2	K1,CO1
2	What are the closure properties of regular languages?	2	K1,CO3
3	Generate ε-NFA to represent a*b|c.	2	K3,CO1
4	Describe the language accepted by the following DFA:	2	K3,CO1

States	Input {0}
→q_0	q_1
q_1	q_2
*q_2	q_0

5	Draw a NFA to accept strings containing the substring 0101.	2	K3,CO1
6	Write Regular Expression for the set of strings over {0. 1} that have atleast one symbol '1'.	2	K3,CO3
7	Define the extended transition function for non-deterministic finite automata.	2	K1,CO1

Part – B (Answer any FOUR) (4 x 10 = 40)

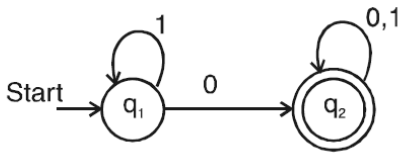
8.	Construct NFA with epsilon for the RE = $(a/b)^*ab$ and convert into DFA and further find the minimal DFA.	10	K3,CO1
9.	a) Prove that "A language L is accepted by some DFA if and only if L is accepted by some NFA"	6	K2,CO1
	b) Construct a DFA accepting binary strings with three consecutive 0s	4	K3,CO1
10.	a) Consider the following ε-NFA and find ε-closure and its equivalent NFA.	8	K3,CO1

δ	ϵ	0	1
$\rightarrow p$	$\{r\}$	$\{q\}$	$\{p, r\}$
q	$\emptyset$	$\{p\}$	$\emptyset$
$*r$	$\{p, q\}$	$\{r\}$	$\{p\}$

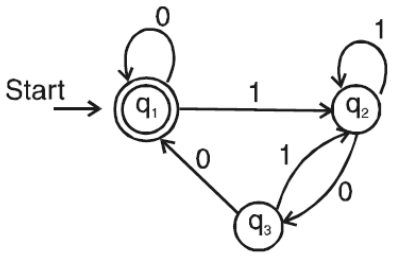
	b) Also check the word '001' for constructed NFA	2	K3,CO3
11.	a) Determine DFA for the given NFA. M = ({p, q, r, s}, {0, 1}, δ, p, {q, s}), where δ is defined as :	6	K1,CO1

States	0	1
p	{q, s}	q
q	r	{q, r}
r	s	p
s	-	p.

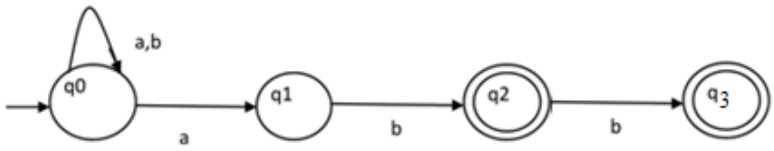
	b) Given Σ={a,b}. Construct a DFA which recognizes the language L={$b^m ab^n$| m,n > 0}	4	K3,CO1
12.	a) State and prove the theorem of DFA to RE such that L(A) = L(R) using R_{ij}^k method.	5	K2,CO3
	b) Find the RE of the given automata	5	K3,CO3



13. a) State the rule of Arden's theorem. Find the RE of the given automata using Arden's theorem. 6 K3,CO3



b) Find the RE of the given automata using the state elimination method 4 K3,CO3



14 a) State and prove the pumping lemma for regular languages. 4 K3,CO3

b) Check whether a language L= $\{0^n1^{2n}\}$ is regular or not. 6 K3,CO3

************B E S T O F L U C K************

Prepared by	
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Reviewed by HoD, CSE