Enrollment No.												

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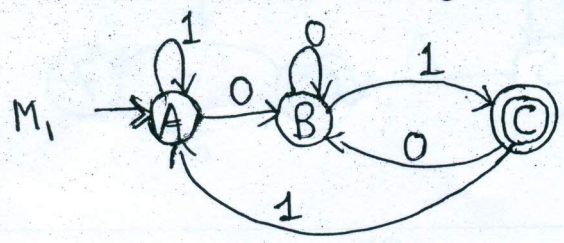
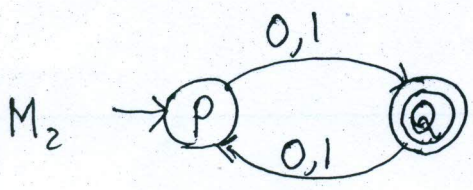
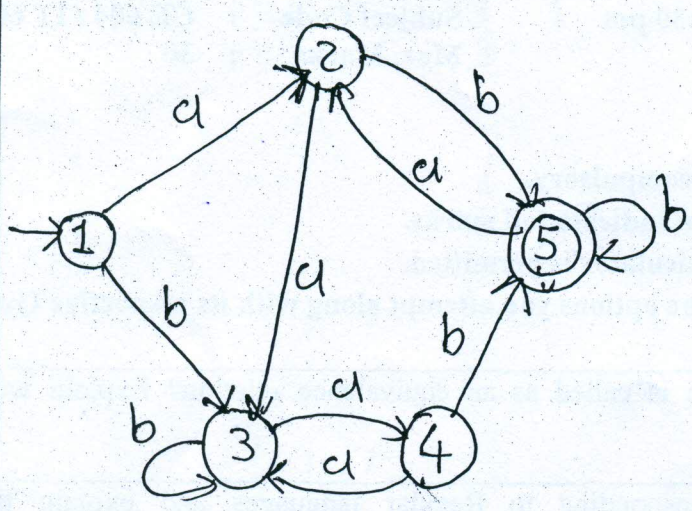
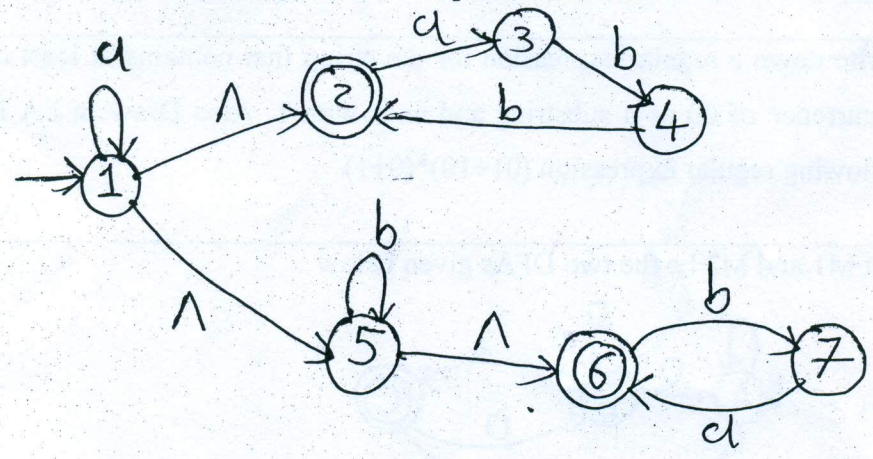
LDRP INSTITUTE OF TECHNOLOGY & RESEARCH, GANDHINAGAR.
B.E. Sem - VI (CE/IT) MID-SEMESTER EXAM. March-2015

Date	**:**	**3/03/2015**	**Subject**	**:**	**Theory of Computation**
Time	**:**	**12:00 pm to 01:30 pm**	**Subject Code**	**:**	**CE 604 / IT 604**
Day	**:**	**Tuesday**	**Max. Marks**	**:**	**30**

Instructions:

1) **All questions are compulsory.**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is permitted.**
4) **Indicate clearly, the options you attempt along with its respective Que. No.**

Q-1 (a)	When a Relation is called as an equivalence relation? Explain with Example.	**(1.5)**
(b)	Define RE corresponding to Regular languages and explain the precedence of RE operators.	**(1.5)**
(c)	Check whether the language $L=(0^n 1^n /n>=1)$ is regular or not? Justify your answer.	**(3.5)**
(d)	Prove that for every $n>=1$, the number of subsets of $\{1,2,\ldots,n\}$ is 2^n.	**(3.5)**
Q-2 (a)	Write down a regular expression for the string that contains at least one occurrence of 00 as a substring and ends with 1. Also Draw a FA For following regular expression (01+10)*(0+1)	**(5)**
(b)	Let M1 and M2 be the two DFAs given below  	**(5)**

	Draw DFA recognizing L1-L2 where L1 and L2 correspond to M1 and M2 Respectively.	
	OR	
(b)	Convert the following FA into Minimal FA.  	**(5)**
Q-3 (a)	Prove that : For any NFA-^ M=(Q,∑,q0,a,δ) accepting the language L∈ Σ^*, there is an NFA M1=(Q1,∑,q1,a1,δ1) that also accepts L.	**(5)**
(b)	Convert the following NFA-^ to equivalent DFA.  	**(5)**
	OR	
Q-3 (a)	Give the Proof of Kleene's Theorem Part 1 and using it construct NFA-^ for the following (00+10)*(1+0)*(00)*	**(10)**