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**PRESIDENCY UNIVERSITY  
BENGALURU  
SCHOOL OF ENGINEERING**

**TEST - 1**

**Even Semester:** 2018-19

**Course Code:** CSE 208

**Course Name:** Theory Of Computations

**Programme & Sem:** B.Tech (CSE) & IV Sem

**Date:** 06 March 2019

**Time:** 1 Hour

**Max Marks:** 40

**Weightage:** 20%

**Instructions:**

(i) Draw neat Diagrams wherever necessary.

**Part A**

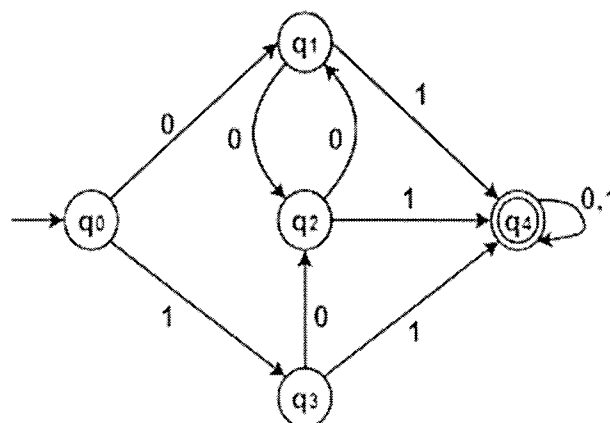
Answer **all** the Questions. **Each** question carries **four** marks.

(3Qx4M=12)

1. Construct a NFA accepting all strings whose **second last symbol is 0** (Second symbol from the right end is 0) over  $\Sigma = \{0, 1\}$ .
2. Following is the transition table of an NFA. Does the automata accepts the string **aab** if **q0** is the start state and **q1** is the accepting state over  $\Sigma = \{a, b\}$ ? Trace.

	a	b
q0	{q0, q1}	{q0}
q1	-----	{q2}
q2	{q2}	{q2}

3. Minimize the following DFA.

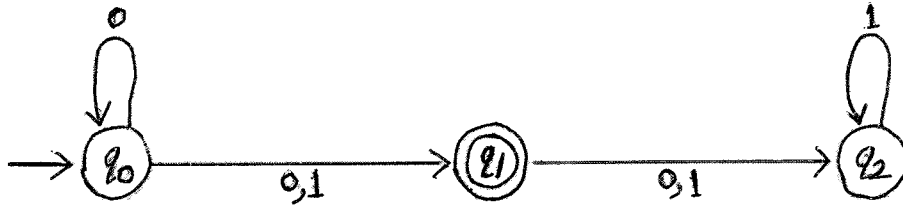


### Part B

Answer **both** the Questions. **Each** question carries **eight** marks.

(2Qx8M=16)

4. Find one string accepted and one string rejected by the following Transition Graph and Convert the following Transition Graph to an equivalent DFA.  $q_0$  is the start state and  $q_1$  is the accepting state over  $\Sigma = \{0, 1\}$



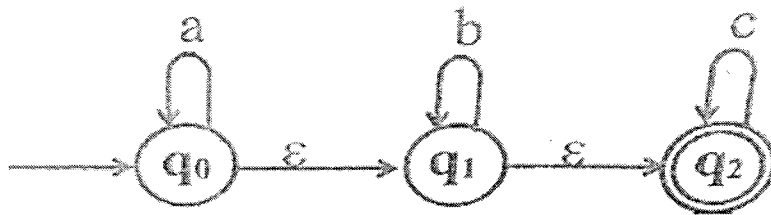
5. Construct a DFA that accepts strings with Even number of 0's & even no of 1's over  $\Sigma = \{0,1\}$ . Trace the string **1011** on the constructed DFA.

### Part C

Answer the Question. Question carries **twelve** marks.

(1Qx12M=12)

6. a) Write the **Delta functions** of **DFA**, **NFA** and **NFA- $\lambda$** . (3 M)
- b) Convert the following NFA- $\lambda$  ( $a^*b^*c^*$ ) to an equivalent DFA over  $\Sigma = \{a, b, c\}$ . (9 M)





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**PRESIDENCY UNIVERSITY  
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**TEST - 2**

**Even Semester:** 2018-19

**Course Code:** CSE 208

**Course Name:** Theory of Computations

**Program & Sem:** B.Tech & IV Sem

**Date:** 16 April 2019

**Time:** 1 Hour

**Max Marks:** 40

**Weightage:** 20%

**Instructions:**

- (i) Read the question properly and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and Non-programmable calculators are permitted.

**Part A**

Answer **all** the Questions. **Each** question carries **four** marks.

(3Qx4M=12)

1. Convert the following languages into regular expressions.
  - a) The set of all strings that begin with 110.
  - b) Strings of a's and b's whose lengths are multiples of 3.
2. Convert the following regular expressions  $011(1+0)^*$  into nfa with  $\epsilon$  transitions. (use thomson construction)
3. Construct a CFG for the following language  $L=\{ww^r : w \in \{a,b\}^*\}$

**Part B**

Answer **both** the Questions. **Each** question carries **eight** marks.

(2Qx8M=16)

4. State the pumping Lemma for Regular Languages. And show that  $L=\{a^n b^n | n \geq 0\}$  is not Regular
5. Prove that Regular languages are closed under Union, Intersection, concatenation, star closure.

### Part C

Answer the Question. The Question carries **twelve** marks.

(1Qx12M=12)

6. a) Consider the following grammar.

$$S \rightarrow AaAb \mid BbBa$$

$$A \rightarrow aAb \mid bAB \mid d$$

$$B \rightarrow aB \mid bBa \mid \epsilon$$

Generate the LMD, RMD & Parse tree for the string  $w = badbabaadb$

b) Consider the following CFG,

$$S \rightarrow aS \mid aSbS \mid \epsilon$$

Show that deviation for the string  $aab$  is ambiguous.