DEERWALK INSTITUTE OF TECHNOLOGY			
MID TERM EXAMINATION, SEM IV		**SUBJECT**	**CSC – 257 THEORY OF COMPUTATION**
PASS MARK	**12**	**FULL MARK**	**30**
TIME	**1.5 HRS**	**DATE**	**12 OCTOBER, 2020**

INSTRUCTIONS

The student should not use his or her textbook, course notes, or receive help from internet or any other outside source.

Students should read the guidelines carefully before starting the examination.

Students should rename their answer sheet name as Roll No_Subject.
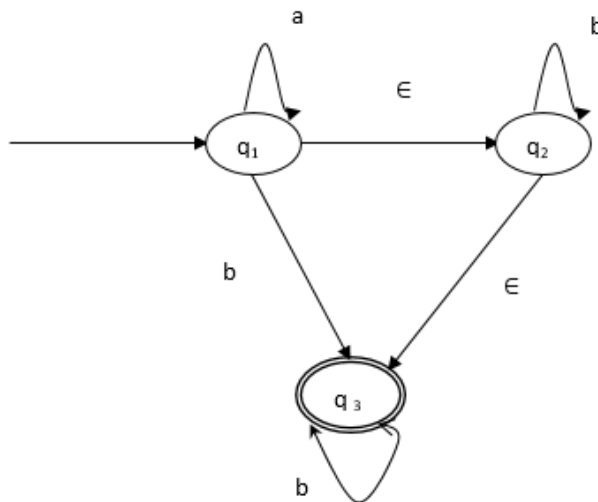
Good luck and all the best.

Attempt Any Four Questions [4×5=20]

1. Design DFA for the following language.

    a. $L = \{(0,1)^i 1^{2j} \mid i \geq 1, j \geq 1\}$

    b. $L = \{w\varepsilon(a,b)^*: n_b(w) \bmod 3 > 1\}$

2. Convert the following epsilon-NFA to equivalent DFA

3. Show that the language $\{L = a^n b^n \; ; n > 0\}$ is not regular.

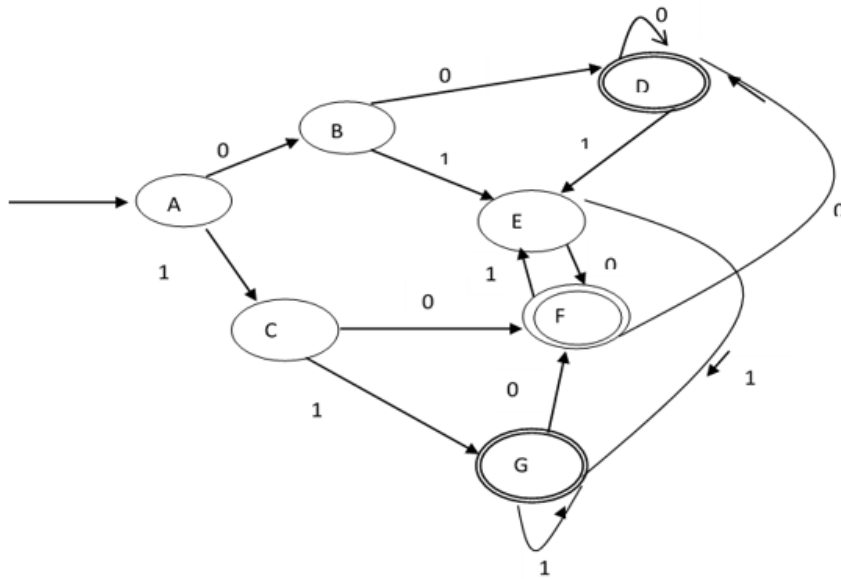4. Define regular expression with example. Also write the application of regular expression.

5. Convert the following R.E. to equivalent E-NFA

    a. $a(a+b)^* aab(a+b)^*$

    b. $(0+1)^* 1^*(00+11)(0+1)^*$

6. Minimize the following DFA

7. State and prove the Arden's Theorem. Find the R.E. for the transition diagram.

   Also define DFA, NFA, and epsilon NFA with suitable examples