Quiz 1
Total marks: 10
Student ID: _____ **Duration: 25 minutes** CSE331

You have to use the designated spaces for your answers. No extra pages will be provided.

Problem 1: Regular Languages and DFAs (10 points)

Let $\Sigma = \{0, 1\}$. Consider the following pair of languages over Σ. We denote by 1^m the string $\underbrace{111\ldots111}_{m \text{ times}}$.

$$L_1 = \{w : w = 1^m \text{ where } m \text{ is odd}\}$$

$$L_2 = \{w : w \text{ does not contain any } y \in L_1 \text{ as a substring}\}$$

(a) Write down a length 6 string that is in L_2. (1 point) _____.

(b) Give the state diagram for a DFA that recognizes L_1. (5 points)

(c) Give the state diagram for a DFA that recognizes L_2. (3 points)

(d) Give the state diagram for a DFA that recognizes $L_1 \cap L_2$. You can use the construction shown in class but there is a much simpler DFA. (2 points)

Intentionally left blank. Feel free to use this space to do scratch work.