Quiz 1
Total marks: 10
Student ID: _____ **Duration: 20 minutes** CSE331

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

Problem 1: Designing DFAs (10 points)

Let $\Sigma = \{0, 1\}$. Consider the following languages over Σ.

$$L_1 = \{w : \text{the length of } w \text{ is two}\}$$

$$L_2 = \{w : \text{the number of times } 10 \text{ appears in } w \text{ is odd}\}$$

(a) Give the state diagram for a DFA that recognizes L_1. (2 points)

(b) Give the state diagram for a DFA that recognizes L_2. (4 points)

(c) If were to construct a DFA for the language $L_1 \cap L_2$ using the construction shown in class, how many states would it have? (1 point) _____

(d) How many strings are in $L_1 \cap L_2$? (1 point) _____

(e) Give a 4-state DFA for the language $L_1 \cap L_2$. (2 points)