Quiz 2

1. Let $L = \{010, 101, 001, 011\}$, and $K = \{w \mid 0w \in L\}$. Which of the following strings is a member of K?

   (A) 0101
   (B) 01
   (C) 011
   (D) 0110

   The correct answer is (B).

2. Let Σ_1 and Σ_2 be two alphabets, with $\Sigma_1 \neq \Sigma_2$. Which of the following is necessarily true?

   (A) $\Sigma_1^* = \Sigma_2^*$
   (B) $\Sigma_1^n = \Sigma_2^n$ for all n
   (C) $|\Sigma_1^n| = |\Sigma_2^n|$, for all n. Here $|A|$ denotes the number of elements in the set A.
   (D) $\Sigma_1^0 = \Sigma_2^0$

   The correct answer is (D).

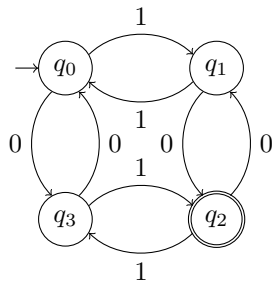

Figure 1: DFA M for questions 4 and 5

3. Consider the DFA M over the alphabet $\{0, 1\}$ shown in Figure 1. Which of the following strings is accepted by M?

   (A) ϵ
   (B) 0011
   (C) 1111000
   (D) 1011

   The correct answer is (D).

4. The language recognized by DFA M in Figure 1 is

   (A) $\{w \mid w$ has even length$\}$
   (B) $\{w \mid w$ has an odd number of 1s and an odd number of 0s$\}$
   (C) $\{w \mid w$ has an equal number of 0s and 1s$\}$
   (D) $\{w \mid w$ has an odd number of 1s$\}$.

   The correct answer is (B).