Introduction to Python Programming
Data Structures Quiz

Instructions:

- Answer all questions.
- For Questions 1–5, choose the best option.
- For Questions 6–8, mark True or False.
- For Questions 9–10, write detailed answers with examples.

1. Which of the following Python data structures is **immutable**?

(A) List

(B) Dictionary

(C) Tuple

(D) Set

2. What is the output of the following code?

```
my_dict = {'a': 1, 'b': 2, 'a': 3}
print(my_dict['a'])
```

(A) 1

(B) 2

(C) 3

(D) KeyError

3. Which method is used to add an element to the **end** of a list in Python?

(A) `insert()`

(B) `add()`

(C) `append()`

(D) `extend()`

4. What will be the output of the following code?

```
s = {1, 2, 3, 2, 1}
print(len(s))
```

(A) 5

(B) 3

(C) 2

(D) Error

5. Which of the following correctly creates an empty dictionary?

(A) `d = []`

(B) `d = {}`

(C) `d = set()`

(D) `d = dict[]`

6. Lists in Python can contain elements of different data types. (True/False)

7. Dictionary keys in Python must be unique, but values can be duplicated. (True/False)

8. The `pop()` method on a set removes and returns the last element added to the set. (True/False)

9. Compare and contrast **lists** and **tuples** in Python. Discuss their mutability, use cases, and performance considerations. Provide code examples to illustrate at least two key differences.

10. Explain how **dictionaries** work in Python, including their underlying hash table mechanism. Describe what makes a valid dictionary key and demonstrate with examples how to add, update, and delete key-value pairs.