Assignment 7

Date: Mon, 06 Oct, 20:00

1. The following code was written for a function that performs a specific task. Explain what the function does. 1 point

```python
def function(x):
    return x ** 2
```

2. Explain the difference between a list and a tuple in Python. 1 point

A list is a heterogeneous collection of elements that can be modified, while a tuple is a homogeneous collection of elements that is immutable.

3. Write a function that checks if a given number is prime. The function should return True if the number is prime and False otherwise. 1 point

```python
def is_prime(n):
    if n < 2:
        return False
    for i in range(2, n):
        if n % i == 0:
            return False
    return True
```

4. What is the output of the following code? 1 point

```python
a = 5
b = 3
print(a + b)
```

5. Explain the difference between a class and an instance in Python. 1 point

A class is a blueprint for creating objects, while an instance is an object that is created from a class.

6. Write a class that represents a bank account. The class should have methods for depositing money, withdrawing money, and checking the balance. 1 point

```python
class BankAccount:
    def __init__(self, balance):
        self.balance = balance

    def deposit(self, amount):
        self.balance += amount

    def withdraw(self, amount):
        if self.balance >= amount:
            self.balance -= amount
        else:
            print("Insufficient funds.")

    def check_balance(self):
        return self.balance
```

7. What is the output of the following code? 1 point

```python
a = [1, 2, 3]
b = [1, 2, 3]
c = a + b
print(c)
```

8. Explain the difference between a string and a bytes object in Python. 1 point

A string is a sequence of Unicode characters, while a bytes object is a sequence of bytes.

9. Write a function that finds the length of a string. The function should return the number of characters in the string. 1 point

```python
def string_length(s):
    return len(s)
```

10. What is the output of the following code? 1 point

```python
a = "Hello"
b = "World"
c = a + b
print(c)
```

11. Explain the difference between a variable and a constant in Python. 1 point

A variable can be modified, while a constant cannot be modified.

12. Write a function that calculates the area of a circle given its radius. The function should return the area. 1 point

```python
import math

def area_of_circle(radius):
    return math.pi * radius ** 2
```

13. What is the output of the following code? 1 point

```python
a = [1, 2, 3]
b = a
b[1] = 5
print(b)
```

14. Explain the difference between a list and a set in Python. 1 point

A list is a heterogeneous collection of elements that can be modified, while a set is a collection of elements that is unordered and unindexed.

15. Write a function that checks if two strings are anagrams. The function should return True if they are anagrams and False otherwise. 1 point

```python
def are_anagrams(s1, s2):
    return sorted(s1) == sorted(s2)
```

16. What is the output of the following code? 1 point

```python
a = "Hello"
b = "World"
c = a * 2 + b
print(c)
```

17. Explain the difference between a function and a method in Python. 1 point

A function is a standalone block of code that can be called by its name, while a method is a function that is defined within a class.

18. Write a program that prints the first 10 prime numbers. 1 point

```python
def is_prime(n):
    if n < 2:
        return False
    for i in range(2, n):
        if n % i == 0:
            return False
    return True

def print_first_10_primes():
    primes = []
    n = 2
    while len(primes) < 10:
        if is_prime(n):
            primes.append(n)
        n += 1
    return primes

print(print_first_10_primes())
```

19. What is the output of the following code? 1 point

```python
a = [1, 2, 3]
b = a
b.append(4)
print(b)
```

20. Explain the difference between a tuple and a dictionary in Python. 1 point

A tuple is an immutable sequence of elements, while a dictionary is a key-value pair collection.