

Category A: (Advanced / High Achievers)

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

```
def dynamic_changer(val, container=[]):
    container.append(val)
    return container

print(dynamic_changer(10))
print(dynamic_changer(20, [30]))
print(dynamic_changer(40))
```

2. Predict the output and state the underlying concept of scope resolution (LEGB rule):

```
x = 5
def outer():
    x = 10
    def inner():
        nonlocal x
        x += 5
        print("Inner:", x)
    inner()
    print("Outer:", x)
outer()
print("Global:", x)
```

3. Find the errors in the following function definition and rewrite the corrected code:

```
def calculate_tax(salary, tax_rate = 0.10, rebate):
    pass
```

4. What is the output of the following dictionary-string manipulation logic?

```
text = "Success"
freq = {}
for char in text:
    freq[char] = freq.get(char, 0) + 1
print(freq)
```

5. Trace the execution and predict the output of the following code snippet:

```
def alter_data(L):
    for i in range(len(L)):
        if L[i] % 2 == 0:
            L[i] //= 2
        else:
            L[i] *= 3

numbers = [10, 15, 20, 25]
alter_data(numbers)
print(numbers)
```

6. Evaluate the slicing expression and explain the output step-by-step:

```
my_tuple = (1, 2, 3, 4, 5, 6, 7, 8)
print(my_tuple[::-2])
```

7. Explain the behavior of Python when a function returns multiple values. What data type is used, and how can it be unpacked? Provide a brief code example.

8. Evaluate the slicing expression and explain the output step-by-step:

```
my_tuple = (1, 2, 3, 4, 5, 6, 7, 8)
print(my_tuple[::-2][1:3])
```

- 9. Identify the difference in behavior between passing a list vs. a tuple to a user-defined function that attempts to modify elements at a specific index.**
- 10. A module `analytics.py` defines a global variable `score = 100`. If you import it using `from analytics import score` and modify `score = 200` in your main script, does the variable inside the module change? Explain.**

Category B: (Average / Core Conceptual)

1. Differentiate between positional arguments and default arguments with a suitable programming example.
2. Predict the output of the following slice operation on a string:

```
msg = "ComputerScience"  
print(msg[-7:-2])
```

3. What is the difference between built-in functions and functions defined inside a module? Name two functions from the `math` module.
4. Trace the output of this simple scope-based script:

```
num = 50  
def change():  
    global num  
    num = 100  
    print("Inside:", num)  
change()  
print("Outside:", num)
```

5. Write a user-defined function `count_vowels(sentence)` that takes a string argument and returns the count of vowels present in it.
6. What will be the output of the following list manipulation program?

```
data = [10, 20, 30]  
data.insert(1, 15)  
data.append([40, 50])  
print(len(data))
```

7. Correct the syntax errors in the following code block & write code again:

```
Def Greeting(name)  
    print("Hello" + name)  
Greeting(name = "Amit")
```

8. Explain the concept of 'Flow of Execution' when a program encounters a function definition followed by a function call.
9. What will be the output of the following code containing a dictionary?

```
student = {"Roll": 1, "Name": "Aman", "Marks": 85}  
student["Marks"] = 90  
student["Grade"] = "A"  
print(len(student))
```

10. Can a tuple contain mutable elements like lists? If yes, can we modify the elements of that internal list? Illustrate with a short snippet.

Category C: (Beginner / Remedial)

1. What keyword is used to define a user-defined function in Python? Write its basic syntax.
2. Classify the following functions into Built-In or Module-defined (assume `math` and `random` are imported):
 - o `print()`
 - o `sqrt()`
 - o `len()`
 - o `randint()`
3. What is the difference between a parameter and an argument?
4. Identify the output of the following code:

```
def add(a, b):  
    return a + b  
result = add(5, 10)  
print(result)
```

5. What will be the output of this string concatenation and multiplication sequence?

```
str1 = "Go"  
str2 = "India"  
print(str1 + str2 * 2)
```

6. Given the list `L = [11, 22, 33, 44, 55]`, write the commands to:
 - o Print the first element.
 - o Print the last element using negative indexing.
7. State whether the following statement is True or False:
"Tuples are mutable data types whereas Lists are immutable data types."
8. What will be the output of the following flow control structure?

```
x = 10  
if x > 15:  
    print("High")  
else:  
    print("Low")
```

9. What is a Local Variable? Where can it be accessed within a program?
10. Given the dictionary `D = {"A": 100, "B": 200}`, how can you access the value associated with the key "B"?