

Python Functions Practice Worksheet

Name: _____ Date: _____ Period: _____

Instructions: Answer each question in the space provided. For code-writing problems, write complete, syntactically correct Python code. For multiple choice questions, circle the letter of the best answer. Show your work for any problems that require reasoning.

1. Write a Python function named `is_even` that takes one integer parameter `n` and returns `True` if `n` is even and `False` otherwise.
2. What is the output of the following code? Show your reasoning.

```
def mystery(x, y):  
    result = x * 2 + y  
    return result  
  
print(mystery(3, 5))
```

3. Consider the following function definition:

```
def greet(name, greeting="Hello"):  
    return greeting + ", " + name + "!"
```

What will be the output of each of the following function calls?

- a. `greet("Alice")`
- b. `greet("Bob", "Hi")`
- c. `greet(greeting="Hey", name="Carol")`

4. Write a function named `calculate_average` that takes a list of numbers as a parameter and returns the average (mean) of those numbers. You may assume the list is not empty.
5. What is the output of the following code? Explain what happens with the variable `x`.

```
def modify(x):  
    x = x + 10  
    return x  
  
x = 5  
modify(x)  
print(x)
```

6. Which of the following is the correct way to define a function in Python that takes two parameters and returns their sum?

- a. `def add(a, b): return a + b`
- b. `function add(a, b) { return a + b; }`
- c. `def add(a, b): print(a + b)`
- d. `def add(a, b) return a + b`

7. Write a function named `count_vowels` that takes a string as a parameter and returns the number of vowels (a, e, i, o, u) in the string. Your function should work for both uppercase and lowercase letters.

8. What is the output of the following code?

```
def outer(x):  
    def inner(y):  
        return y * 2  
    return inner(x) + 1  
  
print(outer(5))
```

9. Write a function named `find_max` that takes a list of numbers as a parameter and returns the largest number in the list. Do not use the built-in `max()` function.

10. Consider the following function:

```
def process(data, multiplier=2, offset=0):  
    result = []  
    for item in data:  
        result.append(item * multiplier + offset)  
    return result
```

What will be the output of each of the following function calls?

- a. `process([1, 2, 3])`
- b. `process([1, 2, 3], 3)`
- c. `process([1, 2, 3], offset=5)`
- d. `process([1, 2, 3], 3, 1)`

Answer Key

1.

```
def is_even(n):  
    return n % 2 == 0
```
2. The output is **11**. The function `mystery` computes $3 \times 2 + 5 = 6 + 5 = 11$, which is then printed.
3.
 - a. "Hello, Alice!"
 - b. "Hi, Bob!"
 - c. "Hey, Carol!"
4.

```
def calculate_average(numbers):  
    total = 0  
    for num in numbers:  
        total += num  
    return total / len(numbers)
```
5. The output is **5**. The variable `x` inside the function is a local copy. Modifying it inside the function does not affect the global `x`, so when `print(x)` is called, it still prints the original value of 5.
6. The correct answer is **(a)**:

```
def add(a, b):  
    return a + b
```
7.

```
def count_vowels(s):  
    vowels = "aeiouAEIOU"  
    count = 0  
    for char in s:  
        if char in vowels:  
            count += 1  
    return count
```
8. The output is **11**. The inner function `inner` doubles its argument ($5 \times 2 = 10$), and then the outer function adds 1, giving $10 + 1 = 11$.
9.

```
def find_max(numbers):  
    largest = numbers[0]  
    for num in numbers:  
        if num > largest:  
            largest = num  
    return largest
```
10.
 - a. [2, 4, 6] (multiplier=2, offset=0)
 - b. [3, 6, 9] (multiplier=3, offset=0)
 - c. [7, 9, 11] (multiplier=2, offset=5)
 - d. [4, 7, 10] (multiplier=3, offset=1)