



JK Lakshmipat University, Jaipur
Institute of Engineering and Technology
End Term Examination, B.Tech., I Semester

Programming 1 (Python) (CS1139)

Duration: 2 hours

MM: 30

Roll Number:

There are 5 questions in this paper with sub-parts. Attempt all questions. Make appropriate assumptions wherever required. Your Python code should have proper comments, indentation, variable names and handle all the valid and invalid test cases.

1. Write the output of the following python code snippets? Assume that there are no indentation or spacing errors. (1x6 - COs 2,3,4)

(a)

```
def f():
    print("f", end=" ")
    return False
def g():
    print("g", end=" ")
    return True
print(f() and g() or g() and f())
```

(b)

```
A = {1, 2, 3, 4}
B = {3, 4, 5, 6}
print(A & B, A | B, A - B, A ^ B)
```

(c)

```
s = ["ab", "cd"]
t = "--".join((s + ["xy"]) * 2)
print(t)
```

(d)

```
n = 5
for i in range(1, n + 1):
    for j in range(i):
        if j == 0 or j == i - 1 or i == n:
            print("*", end="")
        else:
            print(" ", end="")
    print()
```

(e)

```
n = 0b1101
rev = ((n & 1) << 3) | ((n & 2) << 1) | ((n & 4) >> 1) | ((n & 8) >> 3)
print(bin(rev))
```

(f)

```
a = [1, [2, 3], [10, 20]]
b = a
c = a.copy()
d = a[:]
e = [a[0], a[2].copy()]
b[1].append(4)
c[2][0] = 99
print(a)
print(b)
print(c)
print(d)
print(e)
```

2. Given below are code snippets with their objectives. But due to keyboard malfunctioning, some statements are replaced by a number followed by question marks S1??, S2??, S3??, ..., S6??. These represent the missing statements. Suggest the correct statements to meet the objective of the code. (3x2 - COs 3,4)

- (a) **Objective:** The objective of the given code is to combine two dictionaries by adding values for common keys.

Suppose Given Dictionaries:

d1 = {'a': 100, 'b': 200, 'c': 300}

d2 = {'a': 300, 'b': 200, 'd': 400}

Sample Output: {'a': 400, 'b': 400, 'c': 300, 'd': 400}

```
def combine_dicts(d1, d2):
    all_keys = set(S1??)
    result = {}
    for key in all_keys:
        S2??
    return S3??
```

- (b) **Objective:** The objective of both codes is to find the common tuples between two given lists.

Original Lists:

list1 = [('red', 'green'), ('black', 'white'), ('orange', 'pink')]

list2 = [('red', 'green'), ('orange', 'pink')]

Common tuples between the two lists: [('orange', 'pink'), ('red', 'green')]

1.

```
def find_common_tuples(list1, list2):
    return list(S4??)
```

2.

```
def find_common_tuples_while(list1, list2):
    common_tuples = []
    i = 0
    while S5??:
        tuple_item = list1[i]
        j = 0
        found = False
        while j < len(list2) and not found:
            if S6??:
                found = True
            j += 1
        if found:
            common_tuples.append(tuple_item)
        i += 1
    return common_tuples
```

3. (3x2 - CO 3,4)

- (a) Write a program to sort the elements of a list in ascending and descending order without using any built-in function.
- (b) Write a Python program to remove all duplicate elements from a given list. Implement the solution using atleast two different methods.

4.

(3x2 - CO 2,3,4)

- (a) Write a recursive lambda function to find the Fibonacci value of a number n . And, use a for loop to print the first 5 Fibonacci numbers in one line, separated by commas.
- (b) Write a function `is_twin_prime(n)` that returns `True` if the given number is a twin prime, else `False`. A twin prime is a prime number that differs by 2 from another prime number.
Example:

3 → True (because 3 and 5 are twin primes)

5 → True (because 5 and 3 or 5 and 7 are twin primes)

7 → True (because 7 and 5 are twin primes)

11 → False

5.

(2x3 - CO 5,6)

- (a) Compare mutable and immutable data structures in Python with examples.
- (b) Differentiate between `ValueError`, `TypeError`, and `NameError`.
- (c) Explain the use of the `read()`, `readline()`, and `readlines()` methods.

