JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2024

B.Tech-3rd Semester (CSE/IT)

COURSE CODE (CREDITS): 3 MAX. MARKS: 15

COURSE NAME: Python Programming Essentials

COURSE INSTRUCTORS: Dr. Aman Sharma, Dr. Naveen Jaglan, Mr. Ramesh Narwal, Mr. Kuntal Sarkar MAX. TIME: 1 Hour

Note: *(a) All questions are compulsory.*

(b)Marks are indicated against each question in square brackets.

(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q1. What is the output of following Codes? **[Marks: 1*4, CO-1]**

a)

```
i = 8
j = 5
x = 2
y = 3
result = 2 * i / 5 + 4 * j - 3 % i + j - 2
+ x**y - x * y + i * y - i - y
print (result)
```

b)

```
def square(x):

   sum_so_far = 0
   for counter in range(x):
      sum_so_far = sum_so_far + x
  return sum_so_far
```

c)

```
def string_manipulation(s):
   s = s.lower().replace(" ", "")
   vowels = "aeiou"
   result = ""
   for i in range(len(s)):
      if s[i] in vowels:
         result += s[i].upper()
      else:
         result += s[i]
   return result[::-1]

input_string = "Hello World!"
output                              =
string_manipulation(input_string)
print(output)
```

d)

```
def modify_list(lst, tup):
   lst[0] = lst[0] + [tup[1]]
   lst[1] = (lst[1][0], tup[0])

my_list = [[1, 2], (3, 4)]
my_tuple = (5, 6)

modify_list(my_list, my_tuple)
print(my_list)
```

Q2. Compare and contrast the bisection method with other approximation techniques such as guess and check and successive approximation. In what situations is the bisection method particularly advantageous? Provide a detailed explanation with an example. **[Marks: 3, CO-2]**

Q3. A tech startup is developing an application that lists user reviews for products. Each review has a rating (an integer between 1 and 5) and a timestamp. The team needs to implement a feature that sorts these reviews by rating in ascending order, with the ability to sort them by timestamp if the ratings are equal. Given a list of user reviews as tuples (rating, timestamp), write a Python function using the Quick Sort algorithm to sort these reviews by rating. If two reviews have the same rating, they should be sorted by timestamp in ascending order. Provide the function implementation and a brief explanation of how Quick Sort handles the sorting in this scenario. **[Marks: 4, CO-4]**

Q4.

a) Discuss how Python's string manipulation methods (e.g., slicing, concatenation, etc.) can be used to process and analyze textual data. Provide an example of a task that requires extensive string manipulation. **[Marks: 2, CO-3]**

b) You are given a nested list where each sublist contains a student's name and their scores in multiple subjects, like this:

```
students = [ ["Alice", (85, 90, 92)], ["Bob", (70, 80, 78)], ["Charlie", (88, 85, 91)],  ["Diana", (60, 75, 70)]]
```

Write a Python function calculate_averages(students) that returns a list of tuples where each tuple contains a student's name and their average score across all subjects. Only include students whose average score is above 80 in the output list. **[Marks: 2, CO-2]**