KIRINYAGA UNIVERSITY
SCHOOL OF PURE & APPLIED SCIENCES
DEPARTMENT OF PURE & APPLIED SCIENCES
SPS 2471: STATISTICAL COMPUTING III (PA 105)
CAT I FEBRUARY, 2023

INSTRUCTIONS: Attempt **All** Questions. **TIME:** 1 Hour
Additional Instructions

(i) Marks will be awarded for a **running Python code only**.☺

(ii) Remember to **indent your Python codes**, otherwise marks will be deducted for un-indented codes.

QUESTIONS

1. Write the output of the following Python code.
   NB: *Support out answer with an explanation.* (3 Marks)

```
mylist = range(3,45,3)
for i in mylist:
    if (i==6 or i==15):
        continue
    elif i==21:
        break
    print(i,end=" ")
```

Figure 1: Python Code

2. Below are two lists; convert them into a dictionary called "Myvals" and print the created dictionary.
   keys = ['Ten', 'Twenty','Thirty']
   values = [10, 20, 30] (3 Marks)

3. Print the letters of the string "Python" in the same line:
   i. Using a simple for loop. (2 Marks)
   ii. Using the range function. (2 Marks)

4. Given a quadratic equation $ax^2 + bx + c = 0$ the roots of the equation can be found using quadratic formulae: $x_1 = \frac{-b+\sqrt{(b^2-4*a*c)}}{2*a}$ and $x_2 = \frac{-b-\sqrt{(b^2-4*a*c)}}{2*a}$. write a parameterized Python function code that can solve a standard quadratic equation. Include an appropriate message to be output when the discriminant is less than zero. Further, call the function and give a sample output (Use $x^2 - 3x + 2$ to guide your output). (5 Marks)

5. Differentiate between a List and a Tuple as used in Python programming. Use an example to show the difference. (3 Marks)

6. In a certain organization, people are taxed using the following tax bracket.

Range	Tax Rate
$> 20,000$	15%
$10,000 - 20,000$	10%
$< 10,000$	Not taxed

Write Python code that accepts someone's salary, computes and outputs relevant message;
NB: *Use a Python function.*

   i. The tax amount. (2 Marks)

   ii. Net salary (Gross-tax). (2 Marks)

7. Write the output of the following Python code.
NB: *Support out answer with an explanation.* (3 Marks)

```
for i in range(2,10):
    for j in range(2,14,4):
        if i%3==0 and j%2==0:
            print(i,"*",j,"=",i*j,"\n")
    print('\n')
```

Figure 2: Python Code

8. Using Python Code, Create a data frame called "mydata" that when run, it will give the following output; (5 Marks)

Name	University	Class Awarded	Year Awarded
James	Nairobi	First	2017
Peter	Kirinyaga	Pass	2019
John	Chuka	Second Lower	2018
Mercy	Moi	Pass	2021
Jane	JKUAT	second Upper	2018

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