



MACHAKOS UNIVERSITY
SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

SECOND SEMESTER, 2021/2022 ACADEMIC YEAR

FIRST YEAR SUPPLEMENTARY/SPECIAL EXAMINATION FOR THE
DEGREE OF BACHELOR OF SCIENCE IN CLOUD COMPUTING AND
INFORMATION SECURITY

SCC 121: PYTHON PROGRAMMING

DATE: _____

TIME: 2 HRS

EXAMINATION SESSION: JUNE

YEAR 2022

INSTRUCTIONS

- i) Answer question ONE and other TWO questions**
- ii) Write on both sides of the answer sheet**

QUESTION ONE (30 marks, Compulsory)

- a) Define the following terms
 - i) Recursive function (2 marks)
 - ii) Exception (2 marks)
 - iii) Pseudocode (2 marks)
- b) Give all integers between 1 and 20 answer the following questions
 - i) Use a control structure to write Python code to print ALL integers divisible by 2 (even numbers) (5 marks)
 - ii) Draw a flow chart for the solution to 2(a) above. (5 marks)
- c) You can express the definition of $n!$ recursively like this:

$$n! = \begin{cases} 1 & \text{for } n = 0 \text{ or } n = 1 \\ n \times (n - 1)! & \text{for } n \geq 2 \end{cases}$$

Using the definition provided above, write a Python program to compute the factorial of 9 (9!) **(5 marks)**

d) Given an array of Colours provided, answer the questions below

Colours = ["Red", "Green", "Blue", "Black"]. Write Python code to

- i) Traverse the array **(3 marks)**
- ii) Insert "Yellow" between "Green" and "Blue" Colours **(3 marks)**
- iii) Delete "Red" Colour from the array **(3 marks)**

Question TWO (20 marks)

a) Factorial of a number is the product of all the integers from 1 to that number. For example, the factorial of 6 (denoted as 6!) is 1*2*3*4*5*6 = 720. Write the code of a recursive function to find the factorial of an integer. **(8 marks)**

b) Use the table below to construct a chained conditional (nested if statement) to print the string of characters given the conditions **(6 marks)**

	P>=Q	P<Q
X>Y	MACHAKOS	NAIROBI
X<=Y	MAKUENI	KITUI

c) Draw a Flow-Chart for the problem described above **(6 marks)**

Question THREE (20 marks)

a) Study the code below and answer the following questions

```
for i in range(1,10):
```

```
    for j in range(0,i):
```

```
        print(i, end=" ")
```

```
print("")
```

- i) Write the output of the program **(6 marks)**
 - ii) Draw a flow chart for the solution of the problem above **(6 marks)**
- b) Answer the following questions about Text Files in Python
- i) Define Text File **(2 marks)**

- ii) Write Python Code to create a text file with three lines of text separated by newlines **(6 marks)**

Question FOUR (20 marks)

- a) Explain the main principles of object oriented programming **(8 marks)**
b) What is a file? **(2 marks)**
c) Explain TWO types of files **(4 marks)**
d) Write a python program to write the content “hi python programming” for an existing file. **(6 marks)**

Question FIVE (20 marks)

- a) What is the output of
`print tuple[1:3] if tuple = ('abcd', 786 , 2.23, 'john', 70.2)?` **(3 marks)**
b) .Write the syntax/pseudocode and usage of the following control structures
i) For Loop **(3 marks)**
ii) While Loop **(3 marks)**
c) Answer the following questions on Object Oriented Programming in Python
d) Answer the following questions on Object Oriented Programming
i) Define an Object **(2 marks)**
ii) Use an example to explain a Class **(3 marks)**
e) What are the advantages of using flow-charts in programming **(6 marks)**
