



MACHAKOS UNIVERSITY

University Examinations for 2022/2023

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (CLOUD COMPUTING AND INFORMATION
SECURITY)

SCC 121: PYTHON PROGRAMMING

DATE: 13/4/2023

TIME: 2:00 – 4:00 PM

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) Expression (2 marks)
 - ii) Exception (2 marks)
 - iii) Algorithm (2 marks)
- b) Given 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)

	$P \geq Q$	$P < Q$
$X > Y$	MACHAKOS	NAIROBI
$X \leq Y$	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
 - i) Define an Object (2 marks)
 - ii) Use an example to explain a Class (3 marks)
- d) What are the advantages of using flow-charts in programming (6 marks)