



(University of Choice)

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

MAIN CAMPUS

UNIVERSITY EXAMINATIONS
2022/2023 ACADEMIC YEAR

THIRD YEAR 1ST SEMESTER EXAMINATIONS

BACHELOR OF SCIENCE IN
COMPUTER SCIENCE

COURSE CODE: BCS 360E
COURSE TITLE: INTERACTIVE PROGRAMMING PYTHON
DATE : 7/12/2022 **TIME:** 8:00 AM – 10:00 AM

INSTRUCTIONS TO CANDIDATES

Answer Question **ONE (1)** and Any **OTHER 2** questions
Ensure your answers/ideas are clearly expressed
All your answers must be clearly numbered
Write in ink. Rough work can be done (in answer booklet) in pencil and will not be marked. Cross out any rough work.
Calculators, phones, tablets, computers not allowed

TIME: 2 Hours 20 Minutes (20 minutes for reading and choosing questions)

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 04 Printed Pages. Please Turn Over. ►

QUESTION ONE: COMPULSORY QUESTION

[30 MARKS]

(a) Python syntax is made up of various reserved character and keywords:

- i) Define a function called lastCharacter that has a string as a parameter. The function should determine if the last character of a line of code is a colon and return true [2 Marks].
- ii) Using an elif, write a code that will add space equivalent to one tab if the code passed in i) above returns true. [2 Marks]
- iii) Using for loop, write a code that will repeat ii) above until the world class or def is entered as the first string of a line of code [2 Marks]
- iv) Write a code that will determine if a variable called list1, is tuple or a list. The code should return true if the variable is a tuple. [2 Marks]
- v) Using elif, write an appropriate code that can be used for handling exception for iv) above if the code returns true and a user tries to mutate the list1 variable [3 Marks]

(b) Consider the following code

```
Def checkingVariable(varOne = 9 varTwo):  
    print (varOne + vartwo)  
    print (varTwo**2)
```

- i) Identify error(s) in the above code and write a code to correct it in such a way that the function receives to augments (varOne and varTwo) with varOne having a default value of 9 [3 Marks]
 - ii) What will be the output of the following codes that calls the above method
checkingVariable(12, " Twelve") [2 Marks]
checkingVaribale (varTwo = 4 [2 Marks]
- (c) The greatest common divisor (GCD) of a set of integers is the largest integer, less than the smallest integer in the set, that divides each integer in the set. Using a while loop, write a program that reads two integers from the keyboard, calculate and display the GCD of these two integers. [4 Marks]
- (d) Write a python statement to open a file called names for writing and assign it to a variable called outfile [2 Marks]
- (e) Write a function that computes the sum of the digits in an integer. Use the following function header
def sumDigits(n): for example sumDigits(234) returns 9 (2+3+4) [3 Marks]
- (f) Given a list saved in a variable a = [1,4,9,16, 2, 3, 4, 20, 100,19,52,4]

- i) Write a code that returns the smallest number in the list [1 Mark]
- ii) Using list comprehension write one line of python that makes a new list that has only the even elements of this list [2 Marks]

QUESTION TWO:

- a) When `__init__` method excutes, what does the self parameter reference [1 Mark]
- b) Write a class definition named Book. The Book class should have at least three private data attributes of your choice. The class should also have a constructor that accepts augments for all the attributes defined and initialize them [4 Marks]
- c) Write code for accessors and mutators for the defined attributes in b) above [3 Marks]
- d) Write a code for `__str__` method that returns a string indicating the state of the object [2 Marks]
- e) Create an object called bookOne, and pass in any possible arguments for the attributes defined in b) above [2 Marks]
- f) Using methods defined in c) change atleast two attributes of bookOne defined in e) and print the new values using the accessors methods defined in c) [3 Marks]

QUESTION THREE:

- a) Write a program that removes all occurrence of a specified string from a text file and outputs the new file on the screen. Your program should prompt the user to enter a filename and a string to be removed. For example [7 Marks]

Enter a filename: test.txt
Enter the string to be removed: morning

- b) Design a class called Sentences that has a constructor that takes a string representing the sentence as input. The class should have the following methods [2 Marks]
 - i) A method that returns the first word [2 Marks]
 - ii) A method that returns the all words [2 Marks]

- iii) A method that can be used to replace a word with another word passed to it an augment [2 Marks]

QUESTION FOUR:

- (a) Develop a program that can be used by university students studying mathematics to confirm if their calculation for the Nth Fibonacci series is correct. The program should prompt the user to enter the Nth Fibonacci number and compute the sequence that is given by

$$F_n = F_{n-1} + F_{n-2} \quad \text{for} \quad F_0 = 0 \text{ and } F_1 = 1$$

The system should prompt the student to enter the a sequence and compare it with what it has computed. If the student is correct the program should give a feedback of “great work, your answer is correct” and ask the student to try another Nth number that is randomly selected between 1 and 1001 by the program. Finally the program should print the percentage of correct answers after five calculation with the respective comment(i.e above 70, Excellent, above 60 and below 70, Very Good, above 50 and below 60, Good, above 40 and below 50, Fair, and below 40, Fail) [10 Marks]

- (b) Consider the following dictionaries:

d= {1:[1,2], 3:[3,4]}

d= {[1,2]:1,[3, 4]:3}

d = {(1,2):1, (3,4):3}

d= {1:"john",3:"peter"}

- i) Identify two dictionary created correctly [2 Marks]
ii) Identify one dictionary created incorrectly and redefine it [2 Marks]
(c) what is pip? and what is it used for [1 Mark]