LAIKIPIA UNIVERSITY

UNIVERSITY EXAMINATIONS

SECOND SEMESTER 2023/2024 ACADEMIC YEAR

SECOND YEAR EXAMINATION FOR THE DEGREES OF BACHELOR OF SCIENCE IN (ICT) AND BACHELOR OF COMPUTER SCIENCE

COMP 227: OBJECT-ORIENTED PROGRAMMING II

STREAM: R ***TIME: 2 HRS***

DAY: THURSDAY [8.30 – 10.30 A.M] ***DATE: 18/04/2024***

THIS QUESTION PAPER CONSISTS OF FOUR (4) PAGES

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INSTRUCTIONS

- Answer **ALL** questions in section A and any **TWO** questions in section **B**
- All questions in section B carry equal marks

SECTION A (30 MARKS)

QUESTION ONE (30 MARKS)

a) Outline **FOUR** features of python programming language **(4 Marks)**

b) Discuss **TWO** reasons why programmers use comments in their programs **(2 Marks)**

c) Explain **FOUR** data types in python programming language **(4 Marks)**

d) Using some code segment differentiate between the following **(6 Marks)**

   a. Continue statement

   b. Break statement

e) What is printed by the Python code? **(2 Marks)**

```
x = 5
y = x + 3
x = x - 1
z = 10
x = x + z
print('x: {}, y: {}, z: {}'.format(x, y, z))
```

f) A bicycle shop hires out bicycles at different rates per day for the different seasons of years, as illustrated in the following table:

Season	**Charge per day(Kshs)**
Spring	150
Summer	225
Autumn	125
Winter	95

Upon hiring a bicycle, the client is required to pay a deposit of 40% of the total hire cost before taking the bicycle.

You are required to write a python program that will input the season and the number of days, it then computes the hire charge and the deposit, and print out results. **(6 Marks)**

g) Using the following dataset

speed = [99,86,87,88,111,86,103,87,94,78,77,85,86]

Write a python code to calculate the following **(6 Marks)**

a. Mean
b. Median
c. Mode

SECTION B EACH QUESTION IS WORTH 20 MARKS ANSWER ANY TWO QUESTIONS IN THIS SECTION.

QUESTION TWO (20 MARKS)

a) Giving examples, explain **THREE** types of operators in programming. **(6 Marks)**

b) You are required to develop a python program to ask a user to enter three numbers. These values of these numbers are read by a function called getNumber() which then passes their values to another function called Calculator() which will calculate the average and the total for these values then return the result to the calling function.

i. Design a pseudo code for this case **(7 Marks)**

ii. Convert the pseudo code to a python program **(7 Marks)**

QUESTION THREE (20 MARKS)

a) Write a python program that will display only odd numbers between 10 and 20. **(6 Marks)**

b) List **THREE** application areas of Python. **(3 Marks)**

c) Explain **THREE** naming conventions/ rules for Python identifiers **(3 Marks)**

d) Write a Python program that repeatedly asks the user to enter product names and prices. Store all of these in a dictionary whose keys are the product names and whose values are the prices. When the user is done entering products and prices, the program allows them to repeatedly enter a product name and print the corresponding price, but if the product is not in the dictionary the program displays a message. **(8 Marks)**

QUESTION FOUR (20 MARKS)

a) Write a Python program to ask the user to enter a temperature in Celsius. The program should print a message based on the temperature. **(8 Marks)**

- If the temperature is less than -273.15, print that the temperature is invalid because it is below absolute zero.
- If it is exactly -273.15 print that the temperature is absolute zero.
- If the temperature is between -273.15 and 0, print that the temperature is below freezing.
- If it is 0, print that the temperature is at the freezing point.
- If it is between 0 and 100 print that the temperature is in the normal range.
- If it is 100, print that the temperature is at the boiling point.
- If it is above 100, print that the temperature is above the boiling point.

b) Discuss about arrays in Python. **(6 Marks)**

c) Write a python program that calculates the average of three marks and prints the average. The word GOOD should be printed only if the average is more than 80. **(6 Marks)**

QUESTION FIVE (20 MARKS)

a) You are required to develop a POS app. The app should have a class called Product. The class should have fields called "Name", "Amount" and "Price" holding the product's name, the number of items of that product in stock and the regular price of the product respectively. There should be a method ***get price()*** that receives the number of items to be bought and returns the cost of buying that many items, where the regular price is charged for orders of less than 10 items, a 10% discount is applied for orders of between 10 and 99 items, and a 20% discount is applied for orders of 100 or more items. There should also be a method called ***do purchase()*** that receives the number of items to be bought and decreases that amount by that much. Based on this;

i. Write a Python program to implement the design. **(7 Marks)**

b) Discuss about functions in Python. **(7 Marks)**

c) Distinguish between a list, dictionary and tuple in Python using examples **(6 Marks)**