UNIVERSITY OF RWANDA

COLLEGE OF SCIENCE AND TECHNOLOGY
SCHOOL OF ENGINEERING

DEPARTMENT OF CIVIL, ENVIRONMENTAL AND GEOMATICS ENGINEERING

CAT One **Date 20th /11/2024**

YEAR II, SGE-SEM-I **Duration: 1:30 hrs.**

SGE2265: COMPUTER PROGRAMMING FOR GEOMATICS

CAT1 /30

1) Explain the following terms **3pts**
   a) Variables : are the reserved locations used to store values within a python program
   b) Identifier : is a name used to identify a variable, function, class, module or other object
   c) String : is a sequence of one or more unicode characters, enclosed in single, double or triple quotation marks.
2) What are the valid variables among the given variables and explain why: **2pts**
   a) 23a
   b) __b
   c) B
   d) #$23
3) Write python a python program to test if a number typed by a user is positive or negative **2pts**
4) Explain what comments and the type of comments supported by python **2pts**
5) How to check the type of python variable? **2pts**
6) Explain why we need input function? **2pts**
7) What will be the output of the following codes: **2pts**

```
discount = 0
amount = 200
# Check he amount value
if amount > 1000:
  discount = amount * 10 / 100
print("amount = ", amount - discount)
```

Output
amount = 200

200 x 10 = 120 / 100
200 - 120
120 / 1080

8) Write python program to check if a user typed number is divisible two and three? **/5pts**
9) Write a Python program to calculate the sum of three given numbers. If the values are equal, return three times their sum **5pts**
10) Write python program that reads the marks of 5 students and calculate their average. The program should also be cable to computer and display their grades based on the following grading system:
    Average from 80 to 100 Grade A, Average from 60 to 79 Grade B, average less than 60 the grade is Fail **5pts**

Success

Comment is a programmable - readable explanation or annotation in the python source code.
Python supports single-line (or end of line) and multiline (block) comments.

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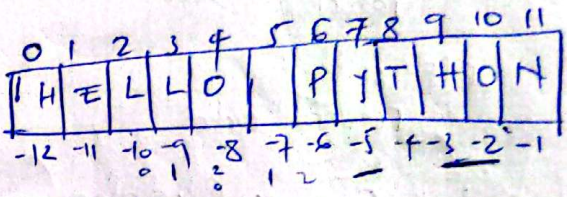
CAT One **Date 18th /12/2024**

YEAR II, SGE-SEM-I **Duration: 1hrs.**

SGE2265: COMPUTER PROGRAMMING FOR GEOMATICS

CAT1 /20

1. Explain why python is important in geospatial data analysis **2pts**
2. Differentiate a string with a list **2pts**
3. Give the output of the following codes: **2pts**
   a. list="HELLO PYTHON" list
   b. print(list[:-1])
   c. print(list[-3:-1])
   d. print(list[-5:])
   e. print(list[0:6:2])
   f. print(list[:9])
   g. print(list[::])
   h. print(list[::-1])



HEL

4. By example explain how we can get a subset of a string from an existing one. **2pts** slicing
5. By example explain how you can access to the string individual character. **2pts** indexing.
6. In a function the arguments used in function definition are known as .....formal..... and those used in function call are known as.....actual..... **2pts**
7. Write a python program using function to test if a given integer value is odd or even? **2pts;**
8. Using a while loop write a python program that will ask a user to type the marks of 10 student and display their average. **2pts**
9. Write a Python program to implement a class called Circle that has private member variables for radius. Include member functions to calculate the circle's area and circumference. **2pts**
10. Write a program to create function calculation () such that it can accept two variables and calculate addition and subtraction. Also, it must **return both addition and subtraction in a single return call 2pts**

```
def addition (a,b):
    Return a+b
def substraction (a,b):
    Return a-b
def calculations (a,b):
    Return calculations
    are
Numbers (
```

```
def test_even_odd (integer)
    for num in integers:
        if num %2==0:
            return Even
        else:
            return odd
    Result even or odd.
a = test_even_odd (4)
```

Success

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END OF SEMESTER I EXAMINATION -ACADEMIC YEAR 2024-2025

YEAR: 2 SEMESTER: II PROGRAMME(S): SGE

MODULE CODE & TITLE: SGE2162 Introduction to Python for Geomatics

DATE: 13/01/2025 **TIME: 2hours**

MAXIMUM MARKS = 50

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1. INSTRUCTIONS

1. This paper contains **FOUR (4)** questions.
2. **Answer THREE (3) Questions only:**
   Question ONE (1) from Section "A" is Compulsory and Answer any TWO (2) from Section "B"
3. Any written materials and Programmable calculators are NOT allowed.
4. Do not forget to write your Registration Number.
5. Write all your answers in the booklet provided
6. Do not write any answers on this questions paper.
7. **Start each question in a NEW page**

SECTION: A

Question: 1 **[20]**

a) Explain the following terms [2]
   i) Data type
   ii) Object
   iii) Dictionary
   iv) List
   v) Class
   vi) Protected data

b) Write codes for creating the geometry point [2]

c) What are the flexible key capabilities that Python provides for geospatial analysis [2]

d) What are the advantages of Files in python [2]

e) Differentiate protected and private data in python OOP inheritance [2]

f) Explain why python string is immutable [2]

g) Explain why do we use functions? [2]

h) Differentiate one liner function and normal python Functions [2]

i) What will be the output of this program? [2]

```
count=0
while count<5:
   count+=1
   print ("Iteration no. {}".format(count))

print ("End of while loop")
```

j) What is Data Encapsulation in python OOP? / [2]

SECTION: B

Question: 2 **[15]**

a) Using a while loop write a python program that will ask a user to type the marks of 10 student and display their average. [5]

b) Write a Python program to implement a class called Circle that has private member variables for radius. Include member functions to calculate the circle's area and circumference. [5]

c) Write a program to create function calculation () such that it can accept two variables and calculate addition and subtraction. In addition, it must return both addition and subtraction in a single return call. [5]

SECTION: A

Question: 1 **[20]**

a) Explain the following terms [2]
   i) Data type
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```

j) What is Data Encapsulation in python OOP? / [2]

SECTION: B

Question: 2 **[15]**

a) Using a while loop write a python program that will ask a user to type the marks of 10 student and display their average. [5]

b) Write a Python program to implement a class called Circle that has private member variables for radius. Include member functions to calculate the circle's area and circumference. [5]

c) Write a program to create function calculation () such that it can accept two variables and calculate addition and subtraction. In addition, it must return both addition and subtraction in a single return call. [5]

Question: 3 [15]

a) Given the following dataset saved in CSV file named marks.csv: [5]

	#	Reg #	Family Name	First Name	Sex	UML	LIS Prototyping (ArcGIS)	Attendance	Total
0	1	18/12052	BUMANZI NKURUNZIZA	Olga	Female	9.0	7.0	11.0	34.0
1	2	18/12099	BYRINGIRO	Eric	Male	9.0	7.0	10.0	34.0
2	3	18/13174	BYRINGIRO	Janviere	Female	9.0	7.0	10.0	34.0
3	4	18/12406	CYOGA	AIME	Male	0.0	7.0	5.0	12.0
4	5	18/12418	DUSABUMUREMYI	Zacharie	Male	9.0	7.0	10.0	34.0
...	...	...	...	...	...	...	...	...	...
57	58	18/12765	UWIMANA	Joseph	Male	9.0	5.0	9.0	30.0
58	59	18/12526	UWIMPAYE	Olive	Female	9.0	5.0	7.0	25.0
59	60	18/12148	UWIMPUHWE	Laetitia	Female	9.0	5.0	8.0	25.0
60	61	18/12149	UWIZEYIMANA	Monique	Female	9.0	5.0	10.0	31.0
61	62	18/12135	MUKASEKURU	Diane	Female	9.0	5.0	8.0	25.0

i) Write python code to open marks.csv file [2]
ii) Write codes to display 20 samples [2]
iii) Write codes to view 5 last elements in dataset [2]
iv) Write slice codes to display all dataset elements [3]
v) Write codes to Display Descriptive/ Statistics of dataset [3]
vi) Write codes to display only two columns (Family Name and Sex) in Dataset [3]

Question: 4 [15]

a) Write python Program to open the file named data.txt in the read mode and print each line present in the file. [5]
b) Using a while loop write a python program that will ask a user to type the marks of 10 student and display their average. [10]