VIT
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

			SLOT: F2
School of Information Technology and Engineering			
Winter Semester 2022-2023			Continuous Assessment Test – I
Programme Name & Branch		MCA & Computer Applications	
Course Code:	ITA6017	Course Title:	Python Programming
Class Number(s)	VL2022230500538, VL2022230500251 & VL2022230500489		
Faculty Name(s)	NIVEDHITHA M, ARUNKUMAR A & BALASUBRAMANI M		

Exam Duration: 90 Min. **Maximum Marks: 50**

General instruction(s): Answer all the questions

Q.No.	Question	Max Marks
1.	a) Write Python code that can compute perimeter and area of the circle using the variables radius and pi=3.14159. Take input radius from the user. b) Write Python script to swap two numbers a=12, b=24 (i) using third variable c (ii) without using third variable	5 5
2.	a) Evaluate the following expressions in python i) 24 // 6 % 3 ii) float (4 + int (2.39) % 2) iii) 2 ** 2 ** 3 iv) not ((125<45.9) & (6*2<=13)) v) (125==521) & (2<3) b) Write a python program to solve the quadratic equation $ax^2+bx+c=0$.	5 5
3.	a) Appraise with an example nested if and elif ladder in Python b) If you are given three sticks, you may or may not be able to arrange them in a triangle. For example, if one of the sticks is 12 inches long and the other two are one inch long, you will not be able to get the short sticks to meet in the middle. For any three lengths, there is a simple test to see if it is possible to form a triangle: If any of the three lengths is greater than the sum of the other two, then you cannot form a triangle. Otherwise, you can. Write a python code that prints either true or false, depending on whether you can or cannot form a triangle from sticks with the given lengths.	5 5
4.	a) Explain with an example while loop, break statement and continue statement in Python. b) Write a Python program to generate first 'N' Fibonacci series numbers. (Note: Fibonacci numbers are 0, 1,1,2,3,5,8… where each number is the sum of the preceding two).	5 5
5.	a) Write a python program to insert a number in a list of sorted numbers without using built in function. b) Write a Python program to replace last value of tuples in a list. Sample list: [(10, 20, 40), (40, 50, 60), (70, 80, 90)] Expected Output: [(10, 20, 100), (40, 50, 100), (70, 80, 100)]	5 5

Slot : F1

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School of Information Technology and Engineering

Winter Semester 2022-2023 (Freshers)

Continuous Assessment Test – II

Programme Name & Branch: MCA & Computer Application

Course Name & code: Python Programming & ITA6017

Class Number (s): VL2022230500452, VL2022230500502, VL2022230500488

Faculty Name (s): Dr. Arun Pandian J, Dr. Jothish Kumar M, Mr. Arunkumar A

Exam Duration: 90 Min. **Maximum Marks: 50**

General instruction(s):

Write your programs with proper syntax and indentation

Q.No.	Question	Max Marks
1.	a) There is a sequence of words in CamelCase as a string of letters, S, having the following properties: • It is a concatenation of one or more words consisting of English letters. • All letters in the first word are lowercase. • For each of the subsequent words, the first letter is uppercase and the rest of the letters are lowercase. Given S, determine the number of words in S. (5 Marks) Sample Test Cases: Input 1: AroundTheWorld Output 1: 3 Input 2: saveChangesInTheEditor Output 2: 5 b) Reduce a string of lowercase characters in range ascii['a'..'z']by doing a series of operations. In each operation, select a pair of adjacent letters that match, and delete them. Delete as many characters as possible using this method and return the resulting string. If the final string is empty, return Empty String. (5 Marks) Sample Test Cases: Input 1: aaabccddd Output 1: abd Input 2: aa Output 2: Empty String	10
2.	Two strings are anagrams of each other if the letters of one string can be rearranged to form the other string. Given a string, find the number of pairs of substrings of the string that are anagrams of each other using a python program. Example: S = mom The list of all anagrammatic pairs is [m,m], [mo, om] at positions [[0], [2]], [[0,1], [1,2]] respectively.	10

	Sample Test Cases: Input 1: abba Output 1: 4 Explanation 1: The list of all anagrammatic pairs is [a,a], [ab, ba], [b,b] and [abb, bba] at positions [[0], [3]], [[0,1], [2,3]], [[1],[2]] and [[0,1,2], [1,2,3]] respectively. Input 2: abcd Output 2: 0 Explanation 2: No anagrammatic pairs exist in the second query as no character repeats.	
3.	Write a Python script to check the validity of a driving license using regular expression. • It should be sixteen characters long • The first two characters should be an upper case alphabet. • The third and fourth characters should be a number. The range should be 01-99. • The fifth character should be a white space. • The next four characters should be a number, but the first two characters should be either 19 or 20 and the third and fourth characters should be any number range between 00-99. • The last seven characters is a license numbers. It should be only numbers ranging between 0000001 -9999999. Sample Test Cases: Input 1: TN09 20181563489 Output 1: Valid Driving License Input 2: TN16 16450265478 Output 2: Invalid Driving License	10
4.	Create a Python user-defined function named "palindrome" and assume your input is a lowercase string. Find the length of the longest substring of a given string such that the characters in it can be rearranged to form a palindrome. Sample Test Cases: Input 1: murali Output: 1 Input 2: malayalam Output: 9	10
5.	Write a Python function histogram () that takes a string and builds a frequency listing of the characters contained in it. Represent the frequency listing as a Python dictionary and print them in sorted order on 'key'. Sample Test Case: Input: brontosaurus Output: Letter a apperas 1 time/s Letter b appears 1 time/s Letter n appears 1 time/s Letter o apperas 2 time/s ..... Letter u appears 2 time/s	10

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Final Assessment Test – June 2023

Course: ITA6017 - Python Programming
Class NBR(s): 0251 / 0489 / 0538 Slot: F2
Time: Three Hours Max. Marks: 100
Faculty Name: Prof. ARUNKUMAR A / Prof. BALASUBRAMANI M / Prof. NIVEDHITHA M

KEEPING MOBILE PHONE/SMART WATCH, EVEN IN "OFF"POSITION IS TREATED AS EXAM MALPRACTICE

Answer any TEN Questions
(10 X 10 = 100 Marks)

1. a) Explain the basic principles of python language and how is it advantageous than other languages. [4]

   b) Describe the list of python operators and their expression along with their description. Write a python program using Bitwise/operators. [6]

2. Explain the basic structure of Loops and their types. Represent the conditions in steps and structure it in the form of flowchart. Write a python program using the looping constructs and represent the output.

3. Write a Python Program to Convert Integer to Roman numeral using function. Use the following symbols to represent Roman numerals: I, V, X, L, C, D and M.

Value	Symbol
1	I
5	V
10	X
50	L
100	C
500	D
1000	M

Test Case:

Input: 58

Output: "LVIII"

Explanation: L = 50, V= 5, III = 3.

4. Define Dictionaries. State the difference between Dictionaries and tuples in table format. Explain in detail about indexing, sorting, object storage (adding and deleting) elements in dictionary with syntax and example. List out various methods and functions in dictionaries along with their description and syntax.

5. Write a program to check whether digits in a number appear more than once using List.

Test Case:

Enter the Digit:12341

Enter the Number to Search:1

Appears More than Once in a List

6. Write a short note on pandas dataframe object. Create your own dataframe object, discuss four Pandas functions that can be applied on Dataframes.

7. Explain in detail about pattern matching in python with Regular Expressions (RegEx).

i) Write a program to extract the protocol and hostname from the given URL: https://www.vit.ac.in using RegEx using meta characters.

ii) Write a program to perform the validation of an e-mail address using string methods. Write the necessary steps required for validation.

8. Consider the following matrix:

$$\begin{bmatrix} 12 & 11 & 10 & 9 \\ 10 & 9 & 8 & 7 \\ 8 & 7 & 6 & 5 \\ 6 & 5 & 4 & 3 \\ 4 & 3 & 2 & 1 \end{bmatrix}$$

(i) Convert the above list into a NumPy array

(ii) Using appropriate slicing techniques, extract the subarrays

$$U = \begin{bmatrix} 12 & 11 \\ 10 & 9 \\ 8 & 7 \end{bmatrix} \qquad V = \begin{bmatrix} 10 & 9 & 8 \\ 8 & 7 & 6 \end{bmatrix}$$

(iii) Find the matrix product B = UV

(iv) Determine the shape of B.

(v) Is it possible to broadcast the row [1 2] with B? Justify your answer.

9. What is an Exception? State three features of exception handling and assertions in table format. List the types of standard exceptions with the description. Explain in detail about two forms of handling an exception using try statement along with their syntax and an example program.

10. a) Explain briefly about the modules available for the python integration with MySQL and list their advantages. Describe the benefits of python for database programming. **[4]**

b) What is MySQL Connector Python? Write the steps required for connecting MySQL database in python using MySQL Connector Python. Write a python program for creating the Tips table given below by importing MySQL. **[6]**

	total_bill	tip	sex	smoker	day	time	size
0	16.99	1.01	Female	No	Sun	Dinner	2
1	10.34	1.66	Male	No	Sun	Dinner	3
2	21.01	3.50	Male	No	Sun	Dinner	3
3	23.68	3.31	Male	No	Sun	Dinner	2
4	24.59	3.61	Female	No	Sun	Dinner	4
5	25.29	4.71	Male	No	Sun	Dinner	4
6	8.77	2.00	Male	No	Sun	Dinner	2
7	26.88	3.12	Male	No	Sun	Dinner	4
8	15.04	1.96	Male	No	Sun	Dinner	2
9	14.78	3.23	Male	No	Sun	Dinner	2

11. Define embedded python and its principles. List out the functions for getting information from within C/C++ along with the syntax and an example program. Also state the five - stage process for getting the return values from a function call.

12. Describe the Application development with python using Rapid Application Development (RAD) tool. State the various RAD requirements and its solutions using standard libraries.

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