Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER- V EXAMINATION-SUMMER 2023

Subject Code: 3150312 Date: 23/06/2023

Subject Name: Python Programming for Biomedical Engineers

Time: 02:30 PM TO 05:00 PM Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Define a dictionary. What are the advantages of using dictionary over lists.	**03**
	(b)	Write short notes on the following methods. a. keys() c. get(key) b. values() d. clear()	**04**
	(c)	Differentiate between the following: a. pop() and remove() methods of list. b. Del statement and pop() method of list. c. append() and insert() methods of list.	**07**
Q.2	**(a)**	Identify the primary differences between a list and a tuple?	**03**
	(b)	Explain nested dictionaries with an example.	**04**
	(c)	Make a list of the first eight letters of the alphabet, then using the slice operation do the following operations: a. Print the first three letters of the alphabet. b. Print any three letters from the middle. c. Print the letters from any particular index to the end of the list.	**07**
		OR	
	(c)	Write a Python program to input information about a few employees as given below: a. Name b. Employee Id c. Salary The program should output the employee ID and salary of a specified employee, given his name.	**07**

Q.3	**(a)**	Write the output of the below given Python program:
		>>> fact = "In 2012 Sachin Tendulkar became the first cricketer to score 100 centuries (100 runs in a single innings) in international play."
		>>> print(fact.isalpha())
		>>> print(fact.title())
		>>> print(fact.lower())
			03

	(b)	Briefly explain the slice operation of tuples with an example.	**04**
	(c)	Write a program to take an input N and print Fibonacci sequence till N terms.	**07**
		OR	

Q.3 **(a)** Explain zip() function with an example. **03**

(b) With the help of an example explain the concept of nested lists. **04**

(c) Take an input N=5 as an integer and write a program to display a triangle with N rows and N columns of * character, as shown below. **07**

```
*
* *
* * *
* * * *
* * * * *
```

Q.4 **(a)** Differentiate the syntax of if...else and if...elif...else with an example. **03**

(b) Write a program to get the file size of a plain text file. **04**

(c) List and explain any five NumPy functions **07**

OR

Q.4 **(a)** Write a program to remove newline characters from a file. **03**

(b) Explain the different file mode operations with examples. **04**

(c) Given a matrix M write a function Transpose which accepts a matrix M and return the transpose of M. Transpose of a matrix is a matrix in which each row is changed to a column or vice versa. **07**

For example, if input M = $\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$ the program shall give output N = $\begin{bmatrix} 1 & 4 & 7 \\ 2 & 5 & 8 \\ 3 & 6 & 9 \end{bmatrix}$.

Q.5 **(a)** Explain NumPy integer indexing, array indexing, Boolean array indexing and slicing with examples. **03**

(b) Explain the use of range() function with an example. **04**

(c) Assuming the given table, write the python code for the following: **07**

Item	Company	Rupees	US Dollors
TV	LG	12000	700
TV	VIDEOCON	10000	650
TV	LG	15000	800
AC	SONY	14000	750

a) To create the data frame for the above table.

b) To add the new rows in the data frame.

c) To display the maximum price of LG TV.

d) To display the Sum of all products.

e) To display the median of the USD of Sony products.

OR

Q.5 **(a)** Explain NumPy array creation functions with examples. **03**

(b) Write Python program to create and display a one-dimensional array-like object containing an array of data using pandas library. **04**

(c) Write a program that takes a number ‘n’ as input and prints the sum of the squares of the first ‘n’ positive integers. For example, if n = 5, the program should output 55 (1^2 + 2^2 + 3^2 + 4^2+5^2 = 55). **07**

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