

Roll No: _____

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M.Sc. Biochemistry, Semester-III Examination-2023
Paper Title: Analysis & Visualization of Genomic Data; Paper Code: MBC 301

Time: 3 hour

Max Marks: 75

Note: This paper has 3 sections A, B, and C, Attempt all the three sections

Section A: Answer all the questions; Section B: Answer any 2 out of 4; Section C: Answer all the questions, each question has an internal choice

Abbreviations Used

CLO- Course Learning Outcome, PLO- Program Learning Outcome, BTL- Bloom Taxonomy Level: BT level 1- Remember; BT level 2-Understand; BT level 3-Apply; BT level 4-Analyse; BT level 5-Evaluate, BT level 6-Create

Section A (Attempt all questions)

(1X10=10 Marks)

Q. No	Questions	BTL	CLO	PLO
a	Identify the valid identifier out of the following: (i) *value; (ii) \$rate; (iii) for; (iv) rate	1	1	3
b	What will be the output of the following code? print (3**2 + (6 + 3)**(1 + 1))	3	1	3
c	Write the output of the following code: a = [1, 2, 3, 4, 5] sum = 0 for ele in a: sum += ele print(sum)	2	2	2
d	How do you create a variable with the numeric value 15?	1	2	3
e	The correct file extension for Python files is _____	4	3	2
f	In Python, 'Delhi', is the same as "Delhi". (True/False)	2	3	3
g	In Python, the _____ is ordered, changeable, and allows duplicate members.	2	3	3
h	How do you get the number of rows and columns of a Pandas Data Frame?	1	4	3
i	Which keyword is used for function?	3	4	3
j	Biopython is a collection of python modules that provide functions to deal with (i) DNA, RNA & protein sequence operations (ii) Reverse complementing of a DNA string (iii) Finding motifs in protein sequences (iv) All of the above	3	4	3

SECTION B: Long type Questions (Attempt any two out of four)

(2X15=30 Marks)

Q. No	Questions	BTL	CLO	PLO
1	What are Functions in python? Write the syntax for creating a function. What are the applications of functions and their advantages? Write the program to find the GC content.	1	3	3
2	What is Matplotlib in Python? What are some of the features provided by Matplotlib? What is the usage of subplots in Matplotlib? Explain using an example.	2	4	2

3	a) What is indexing and negative indexing in tuple? Illustrate your answer with a suitable example. b) Define indexing and slicing with suitable examples. If Fruit is a list such that <code>Fruit = ['Apple', 'Banana', 'Orange', 'Mango', 'Grapes', 'Cherry']</code>. Write the output of the following: (i) <code>print(Fruit[-2])</code> (ii) <code>print(Fruit[3])</code> (iii) <code>print(Fruit[2:5])</code>	4	1	3
4	What are the various data types in python? Explain in detail. How is reading and writing of files done using python? Write a program to read a file of any file format and display its content on the screen.	3	2	2

SECTION C: Short-type Questions. (Attempt all questions, each question has an internal choice) (5X7=35 Marks)

Q. No	Questions	BTL	CLO	PLO
1	Explain the difference between list and tuples in Python by using a suitable example? OR What is a list data type? Define any five functions of its briefly. If L is a list, and <code>L=['H', 'E', 'L', 'L', 'O', 'I', 'N', 'D', 'I', 'A']</code>, then what will be the output of <code>print(L[3:7])</code>?	1	1	3
2	What type of conditional structures are present in a programming language? How many of them are supported in Python? Explain with a suitable example. OR Write a Python program which iterates the integers from 1 to 50. For multiples of three print "Hello" instead of the number and for the multiples of five print "World". For numbers which are multiples of both three and five print "HelloWorld".	2	2	3
3	Write a program to demonstrate the concept of a dictionary. Use any five predefined functions. OR Write a program that accepts a sentence and calculate the number of digits, uppercase and lowercase letters.	1	3	2
4	Write Python Program to count the number of times an item appears in the list. OR What different types of loops are available in Python? Explain each briefly.	3	4	3
5	Define Python Pandas. What Are The Different Types Of Data Structures In Pandas? Explain with example. OR What is the Concept of axis in pandas. Using an example explain how will you add a column to the Existing Data Frames in Panda?	2	1	3
6	Is indentation required in python? Explain with example OR Discuss the use of pyplot. Explain with an example	1	2	3
7	What is Biopython? What are its uses? Write the program for finding reverse complement. OR How are customized functions created in python? Create a function to download DNA sequencing data.	4	4	3
