

B.Sc.-M.Sc. INTEGRATED PROGRAMME (BIOTECHNOLOGY)
SEMESTER IV, ONLINE EXAMINATION, MAY 2021
PAPER CODE - BBT-GE04

PAPER TITLE: INTRODUCTION TO BIOLOGICAL DATA ANALYSIS

Time : Three Hours

Maximum Marks : 75

Attempt all questions. Use only A4 sheets. All parts of a question must be attempted in continuation. Start answer of a fresh question on a new page. Cite examples and draw labeled diagrams wherever necessary.

[15X1=15]

Q1. State whether TRUE or FALSE.

- The output of the command `print("Hello")` is Hello.
- The index of "a" in "Python a Programming Language" is 14.
- Until loop in bash script is executed if the condition is false.
- `cat` command in linux is used to concatenate two or more files.
- `wc` command is only used to count the number of words in a file.
- pipe (`|`) is used to make the output of one command as input of other command.
- In regular expression `a+` will match the "aaa" pattern.
- `.` in regular expression will match any character.
- Dictionary `l = {"a":1,"b":2,"c":3}`. Dictionary `l.get("d")` will throw an error.
- `X = {1,2,3,1,3,4}` is correct syntax to create a list.
- List comprehension `[i for i in "abcd"]` will give `["abcd"]`.
- The `sort()` method can be used to sort any iterable value.
- We can append an element in a tuple.
- Python debugger can be used to identify bugs in the script.
- Syntax highlighting is a common feature among text editors.

Q2. Briefly describe any THREE of the following with suitable examples. [3X5=15]

- Cut and Copy commands in Unix
- File permissions in Unix
- Regular expressions in Unix
- Loops in Unix
- Conditional statements in Unix

Q3. Attempt any ONE question:

[1x15=15]

- a1). Explain map and filter techniques with suitable examples. Although map and filter are higher order function in Python but List Comprehension is more useful than map and filter. Explain this statement with suitable example. [12]
- 3a2). Why is the lambda function called an anonymous function? Explain giving a suitable example. [3]

OR

- 3b1). Explain the concept and advantages of OOPs in python. [9]
- 3b2). Explain the concept of Exception Handling with suitable examples. What is the advantage of using exception handling in python? [6]

Q4. Attempt any ONE question:

[1x15=15]

- 4a1). Explain the concept of function in Python. What are the advantages of using a function? What are the advantages of using generator function over the normal function? [9]
- 4a2). Consider the string "ATTGTGTGATTGTAGTGTAGTGTGCCCCATAAAA
AAA". Give Python code to perform the following operations:
 - I. Remove the "A"s from the end. [2]
 - II. Find the start and end position of the sequence "A(GT)+". [2]
 - III. Split the given string with GT as a delimiter. You will get a list. Find the length of this list. [2]

OR

- 4b). List1 = ["ATGC", "aaa", "atgu", "GGGGCCCC", "AAAA"]. Answer the following questions:
 - I. Write a function to convert the elements in capitals if they are present in small letters. Return a list from this function and use this list in further questions. [3]
 - II. Write a function to append "AAAAAAA" to those elements of the list whose length is a multiple of 3. [3]
 - III. Write a script to insert "AATTATA" at the 4th position in the list. [2]
 - IV. Write a function that takes List1 as an argument and makes a dictionary having the element as the key and the length of the string as the value. [3]
 - V. Convert this list into a set type data structure. [2]
 - VI. Remove the last element from the list. [2]

Q5. Briefly describe any **THREE** of the following with suitable examples.

[3X5=15]

- a. Modules in Python
- b. Managing Python packages
- c. Integrated Development Environments in Python
- d. Code testing with assert
- e. Text editors in Python

It should be noted that 60 minutes extra time will be provided to scan your answer sheets, build a PDF and upload it to biotechnologyexam2020@gmail.com

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