QP Code: U25B043

Reg. No : .....

Name : .....

ST MARY'S COLLEGE (AUTONOMOUS), THRISSUR-20

II SEMESTER (FYUGP) DEGREE EXAMINATION, MARCH 2025

B.A/B.Sc/B.Com/BSW

BTY2MN101 : COMPUTER FOR BIOSCIENCES

2024 Admission Onwards

(Credits: 4)

Time: 2 Hours **Maximum Marks: 70**

Section A

*Answer **all**. Each question carries **3** Marks* ***(Ceiling: 24 Marks)***

1. Which are the different types of softwares? [BTL1]
2. What are the purposes of word processors? Give an example. [BTL1]
3. What are molecular visualization tools? Explain with an example. [BTL1]
4. Operators and their use in Python programming. [BTL2]
5. Write a short note on variables and datatypes in Python. [BTL2]
6. How can highlighting specific residues or domains in PyMOL enhance the interpretation of protein structures? [BTL2]
7. How will you create a spreadsheet to calculate and summarize enzyme activity using basic formulas like SUM and AVERAGE? [BTL3]
8. Describe the process of inserting images or charts into a document using a word processor. [BTL1]
9. What is multiple sequence alignment? [BTL1]
10. How 'R' can be used to create a scatter plot showing the correlation between enzyme activity and substrate concentration? [BTL3]

Section B

*Answer **all**. Each question carries **6** Marks* ***(Ceiling: 36 Marks)***

11. How do spreadsheets help in organizing and analyzing data? Explain how charts and graphs enhance data interpretation in biosciences. [BTL2]
12. Write a script that asks the user for a number and prints whether it is even or odd. [BTL3]

Turn Over

13. Different types of computers (desktops, laptops, and servers) are used in bioscience research. Analyze their suitability for handling large-scale biological data. Which type would be most efficient for computational biology tasks, and why? [BTL4]

14. Analyze the benefits and limitations of Python for data analysis and visualization in biological research. Provide examples where Python is preferable over other programming languages. [BTL4]

15. Imagine you are setting up a computer lab for a bioscience research center. You need to decide whether to install Windows or Linux as the operating system. Analyze the advantages and disadvantages of both, and justify which one you would choose for scientific research applications. [BTL3]

16. You have been given a 3D structure of a protein involved in a disease. Describe how you would use PyMOL to visualize the structure, highlight key functional regions, and analyze its interactions with a drug molecule. [BTL3]

17. How do control structures (such as if-else statements and loops) improve the efficiency of Python programs? [BTL2]

18. What are the essential components of a computer? Explain the function of the CPU, memory, input devices, and output devices. [BTL1]

Section C

*Answer **any one**. Each question carries **10** Marks* ***(1x10=10 Marks)***

19. Critically assess the role of data visualization in spreadsheets for making scientific decisions. Can misinterpretation of graphs and charts lead to incorrect scientific conclusions? Explain with an example. [BTL5]

20. Investigate the impact of computational tools in solving bioscience problems. Provide an example of a bioscience problem that was successfully solved using computational tools. [BTL4]

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