2022

Microbiology

[P.G.]

(M.Sc. First Semester End Examinations-2022)

PAPER-103

[Biochemistry, Biophysics, and Bioinstrumentation]

Full Marks: 40   **Time: 02 Hrs**

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

Illustrate the answers wherever necessary

Group-A

(MCB-103.1)

Marks 20

1. **Answer any two question from the following:**   **2x2= 4**

   a. What do you mean by Kcat?

   b. Which amino acid residue destabilize the α-heix and why?

   c. Differentiate between a nucleoside and a nucleotide.

   d. Which amino acides have a net positive charge in aqueous solutions at physiological pH? What is invert sugar?   1+1

2. **Answer any two question from the following:**   **2x4= 8**

   a. Briefly describe the interactions that stabilize the proteins.

   b. Write the principle of Sangar method of DNA sequencing.

c. Write the equation of Line weaver-Burk plot and explain the parameters. How do we calculate the km from the Lineweaver-Burk plot?

d. The peptide AGVLWRVKS was digested with the enzyme trypsin and chymotrypsin. Write down the fragments generated. What is compititive inhibition of enzyme?   2+2

3. **Answer any one question from the following:**   **1x8= 8**

a. Write short not on :   4x2

i) motif   ii) fold   iii) domain   iv) denaturation of protein

b. Differentiate between active transport and passive transport with examples. Discuss the mechanism operating related to functioning of bacteriorhodopsin.   4+4

Group-B (MCB-103.2)
Marks 20

1. **Answer any two question from the following:**   **2x2= 4**

a. What is enthalpy?

b. Write Lewis theory with example.

c. What do you mean by positive and negetive ionization in Mass Spectrometry?

d. Write down the applications of confocal microscopy in biological sciences.

2. **Answer any two question from the following:**   **2x4= 8**

a. Write the Law of thermodynamics.

b. Derive the ionic product of water? Write its value at 25^0C.

c. Briefly describe circular dichroism spectroscopy. What is Lambert-Beer law?   2+2

d. What is reverse phase chromatography and how it differes from normal phase?

3. **Answer any one question from the following:**   **1x8= 8**

a. What are the factors influences chromatographic resolution? Name two matrix with their applications used in MALDI-ToF. Write the mechanism of sample ionization in MALDI ToF Mass spectrometry.   3+2+3

b. Write the applications of buffer in biological system. What is Autoradiography.   6+2