

U.G. 1st Semester Examination - 2021**MICROBIOLOGY****[HONOURS]****Course Code : MB-H-CC-L-02****(Biomolecules and Enzymology)**

Full Marks : 40

Time : $2\frac{1}{2}$ Hours*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.*

1. Answer any **five** of the following: $2 \times 5 = 10$
- Write down the full forms of PUFA and MUFA.
 - What is Zwitterion?
 - What do you mean by isozyme?
 - What is mutarotation?
 - Name and give structure of an amino acid that contains guanidine-group in its side chain.
 - Give one example each of sugar acid and amino sugar.
 - What are non-protein enzymes? Give one example.

viii) Why might a low-fat diet affect the bioavailability of fat-soluble vitamins?

2. Answer any **two** of the following: $5 \times 2 = 10$
- Write down the structure of penta-peptide: Met-Gly-Lys-Ala-Phe. Name two sulphur containing amino acids with chemical structure. Amino acids can act as acid and base. Explain. $2+2+1$
 - Differentiate between D-glucose and L-glucose. Write briefly about homo-polysaccharide and Hetero-polysaccharide. $2+3$
 - Write the name of one saturated and one unsaturated fatty acid. What do you mean by protein turn over? Define turn over number of an enzyme. $1+2+2$
 - Which food groups contain the greatest variety of vitamins? What is the principal function of prosthetic group? Write down the name of two vitamins can function as antioxidant. $2+2+1$
3. Answer any **two** of the following: $10 \times 2 = 20$
- State the ninhydrin reaction of amino acid. Draw the titration curve of alanine and explain it (Given pKa and pKb of alanine is 2.4 and 9.9)

[Turn Over]

respectively). Differentiate between parallel and anti-parallel β -sheet structure. Differentiate between saturated and one unsaturated fatty acid. 2+4+2+2

ii) Derive Michaelis–Menten equation and write down the importance of steady-state assumption in deriving this equation. Why Lineweaver-Burk plot is also known as Double Reciprocal plot? What do you mean by zymogen? 2+4+2+2

iii) Differentiate between tertiary and quaternary structures of protein. What do you mean by domain of a protein? Define epimer and explain with the help of an example. Write down the structure of simplest carbohydrate. What do you mean by lipoprotein? 2+2+2+2+2

iv) Distinguish between Z-DNA and B-DNA. T_m value of GC rich DNA fragment is higher than AT rich one. Why? What do you mean by palindromic DNA sequence? Draw the structure of ATP. What are steroids? 2+2+2+3+1
