

**U.G. 1st Semester Examination - 2020**

**MICROBIOLOGY**

**[HONOURS]**

**Course Code : MB-H-CC-L-02**

**Biomolecules and Enzymology**

Full Marks : 40

Time : 2½ 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:  $2 \times 5 = 10$
- How B-DNA and A-DNA differ?
  - What do you mean by Hoogsteen base pairing?
  - Write the name of one saturated and one unsaturated fatty acid.
  - What do you mean by isozyme?
  - What are the functions of co-enzymes?
  - Name two Sulphur containing amino acids with chemical structure.
  - Find out the pH of a solution of 0.01(N) HCl.
  - Give one example each of sugar acid and amino sugar.

2. Answer any **two** of the following:  $5 \times 2 = 10$
- Differentiate between D-glucose and L-glucose. Write briefly about homo-polysaccharide and hetero-polysaccharide.  $2+3$
  - Define dipeptide with figure. Amino acids can act as acid and base. Explain.  $3+2$
  - Why Lineweaver-Burk plot is also known as Double Reciprocal plot? Define turn over number of an enzyme.  $3+2$
  - Give an outline of the structure based classification of lipid. What is lipoprotein?  $3+2$
3. Answer any **two** of the following:  $10 \times 2 = 20$
- Name the nucleosides and nucleotides of RNA and DNA. Tm value of GC rich DNA fragment is higher than AT rich one. Why? What do you mean by palindromic DNA sequence? Give an example.  $4+3+3$
  - Derive Michaelis-Menten equation and write down the importance of steady-state assumption in deriving this equation. Find out the definition of Km from this equation. What do you mean by zymogen?  $4+2+2+2$

[Turn Over]

- iii) Draw the titration curve of alanine and explain it (Given pK<sub>1</sub> and pK<sub>2</sub> of alanine is 2.4 and 9.9 respectively). Differentiate between tertiary and quaternary structures of protein. Differentiate between parallel and anti-parallel  $\beta$ -sheet structure. 5+2+3
- iv) State a brief note about mutarotation. How many stereoisomers can be possible for a carbohydrate having 3 chiral centers? What are reducing and non-reducing sugars? Give example. Write down the structure of simplest carbohydrate. 3+2+3+2
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