

2021

## MICROBIOLOGY — HONOURS

Paper : CC-3

(Biochemistry)

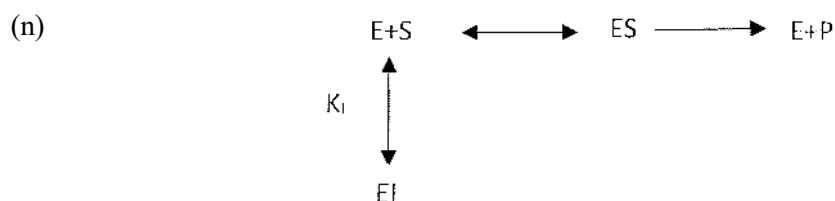
[Unit-1 to Unit-6]

Full Marks : 50

*The figures in the margin indicate full marks.**Candidates are required to give their answers in their own words as far as practicable.*Answer **question no. 1** and **any three** questions from the rest.1. Answer **any ten** questions :

2×10

- Define optical isomers with example.
- What are  $\beta$  turns?
- How many chiral centres does amino acid isoleucine has?
- What is the approximate molecular weight of a protein containing 682 amino acids in a single polypeptide chain?
- Why does egg solidify after boiling while ghee melts after heating?
- Mention the importance of Lineweaver-Burk plot.
- Why butter turns rancid faster than vegetable oil?
- What is hydrogenolysis of fat?
- What is the utility of iodine number?
- Why amino acids are called amphoteric substances?
- Write down the structure of alanyl aspartyl cystinylglycine.
- Name two high energy compounds.
- What are the vitamin precursors of TPP and FAD?

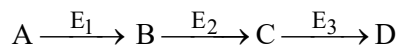


The reaction scheme above depicts which kind of enzymatic reaction?

- Define specific activity by explaining its significance.

Please Turn Over

2. (a) In the following enzyme catalysed reaction what will be the effect on substrates A, B, C, D if the enzyme  $E_2$  is inactivated.



- (b) What are isozymes? Explain with a suitable example.
- (c) What is the fate of amino acid alanine when it is added to a solution with pH 7.3?
- (d) Draw the structure and name of the following :
- Acidic amino acid
  - Basic amino acid
  - Aromatic amino acid. 2+(2+1)+2+3
3. (a) Write the significance of  $K_m$  and  $V_{max}$  in an enzyme catalysed reaction.
- (b) With suitable diagram define allosteric enzyme. Give an example.
- (c) A molecule of amylopectin consists of 1000 glucose residues and is branched every 25 residues. How many reducing ends does it have?
- (d) Draw the structure of ceramide. (1½+1½)+(2+1)+2+2
4. (a) Mention the differences between a liposome and micelle. Include a proper diagram.
- (b) What are  $\omega 3$  and  $\omega 6$  fatty acids? Mention their importance.
- (c) Arrange the following in increasing order of density and diameter and also state their full forms LDL, HDL, VLDL, chylomicron. 3+3+(2+2)
5. (a) Differentiate between coenzyme and prosthetic group.
- (b) What effect do enzyme have on activation energy and change in free energy?
- (c) What is an open system? Give example of a biological open system explaining properly.
- (d) Write about the different forces involved in forming the secondary and tertiary structures of a protein. 2+2+3+3
6. State true or false and justify accordingly : 2×5
- Non-competitive inhibition occurs when a substrate and an inhibitor binding site is same.
  - Fatty acids with longer hydrocarbon chain and saturation have the lowest melting point.
  - Lipids are more suitable for long term energy storage in human.
  - Sucrose is a reducing sugar.
  - Protein folding increases entropy of the molecule.

( 3 )

*T(2nd Sm.)-Microbiology-H/CC-3/CBCS*

7. (a) Which form of glucose is more stable? Explain with structure.  
(b) What happens when glucose is treated with dilute alkali?  
(c) Write down the reaction of glycine with ninhydrin.  
(d) State the Zeroth law of thermodynamics.  
(e) Differentiate the structures of myoglobin and haemoglobin with respect to their tertiary and quaternary structures. 2+2+2+2
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