

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VII (NEW) EXAMINATION – SUMMER 2022****Subject Code:2170401****Date:01/06/2022****Subject Name:Enzymes and Proteins****Time:02:30 PM TO 05:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

|            |  | MARKS     |
|------------|--|-----------|
| <b>Q.1</b> | (a) Give 3 examples of plant or animal based industrial enzyme and their uses.   | <b>03</b> |
|            | (b) Explain the lock and key hypothesis of enzyme substrate reaction.  | <b>04</b> |
|            | (c) Write a note on classification of Enzymes  | <b>07</b> |
| <b>Q.2</b> | (a) Explain the concept of induced fit hypothesis of enzyme substrate activity.  | <b>03</b> |
|            | (b) Compare competitive inhibition with allosteric inhibition.   | <b>04</b> |
|            | (c) Derive the Michealis Menten equation for Enzyme kinetics.  | <b>07</b> |
| <b>OR</b>  |  |           |
|            | (c) Write a note on chemical methods for immobilizing enzymes.   | <b>07</b> |
| <b>Q.3</b> | (a) Give three examples of enzymes which are used in the food industry, along with its application.  | <b>03</b> |
|            | (b) Compare encapsulation and entrapment methods for immobilizing enzymes.   | <b>04</b> |
|            | (c) Explain Sanger's method for sequencing DNA, with diagram.  | <b>07</b> |
| <b>OR</b>  |  |           |
| <b>Q.3</b> | (a) How do we carry out N terminal sequencing of proteins?   | <b>03</b> |
|            | (b) What are chaperones? Does the GROEL and GROES complex in E.coli use ATP for carrying out its function?   | <b>04</b> |
|            | (c) Explain the different phenomena that happen at protein protein interfaces.   | <b>07</b> |
| <b>Q.4</b> | (a) What is the effectiveness factor of an immobilized enzyme? What is effective diffusivity?  | <b>03</b> |
|            | (b) Write a note on immobilization of enzymes through adsorption, its advantages and disadvantages.  | <b>04</b> |
|            | (c) How can you use enzymes for analytical application, explain using an example.  | <b>07</b> |
| <b>OR</b>  |  |           |
| <b>Q.4</b> | (a) Explain primary and secondary structures of proteins.  | <b>03</b> |
|            | (b) How can we understand about the primary structure of a protein using Mass spectroscopy?  | <b>04</b> |
|            | (c) Explain about the tertiary and quaternary structure of proteins and write in brief, how we can use Xray crystallography and NMR to study the 3D structure of proteins. | <b>07</b> |

- Q.5** (a) What are domains in proteins, explain modular structure of proteins using domains. **03**
- (b) Compare crosslinking of enzymes with entrapment of enzymes in gels as method of immobilization. **04**
- (c) Write a note on the evolution of visual pigments. **07**
- OR**
- Q.5** (a) Explain the significance of  $K_m$  and  $V_{max}$ . **03**
- (b) Explain the industrial uses of amylase and cellulose enzymes. **04**
- (c) Write a note on the evolution of the globin fold. **07**

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