

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2023****Subject Code:3171410****Date:16-12-2023****Subject Name: Food Enzymology****Time: 10:30 AM TO 01:00 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.

- Q.1 (a)** State the appropriate reasons for the following statements. **03**
1. Enzymes are referred as biological catalysts.
 2. Temperature versus Enzyme activity graph is not exactly bell-shaped curve.
 3. Gibbs Energy of [ES] is much higher than S or P
- (b)** Compare the salient features of competitive inhibition and uncompetitive inhibition. **04**
- (c)** Explain the different types of enzyme immobilization. Enlist the advantages and limitations of enzyme immobilization. **07**
- Q.2 (a)** How the enzymes inactivate antinutritional factors present in the food? **03**
- (b)** Highlight on the manufacturing process of mono sodium glutamate where enzyme use as processing aid. **04**
- (c)** Discuss the applications of enzymes in fruit processing and baking industry. **07**

OR

- (c)** A biochemist measured the initial rate of an enzyme-catalyzed reaction in the absence and presence of inhibitor A. The inhibitor A concentration was 6.0 mM. The following data were obtained. **07**

[S] /M	$V_o / M.s^{-1}$ No inhibitor	$V_o / M.s^{-1}$ Inhibitor A
4.0×10^{-4}	1.0×10^{-6}	5.6×10^{-7}
1.5×10^{-3}	1.75×10^{-6}	1.68×10^{-6}
3×10^{-3}	2.92×10^{-6}	2.17×10^{-6}
4×10^{-3}	3.58×10^{-6}	2.94×10^{-6}
1.0×10^{-2}	4.12×10^{-6}	3.36×10^{-6}

- i) Determine the values of K_m and V_{max} of the enzyme,
- ii) Determine the type of inhibition imposed by inhibitor A.

- Q.3 (a)** Differentiate between inducible and repressible enzyme regulation. **03**
- (b)** Explain the role of enzymes in deskinning and collagen extraction in fish processing industry. **04**
- (c)** Derive Michaelis-Menten equation and lineweaver-burk equation for uncompetitive enzyme inhibition. **07**

OR

- Q.3 (a)** State the regulation of Arabinose operon in case when both inducer and repressor is present. **03**
- (b)** Highlight on the significance of two consecutive trp codon in regulation of Trp operon. **04**

- (c) Explain Lock & Key model and induced fit model for enzyme catalyzed reaction. **07**
- Q.4** (a) Write the enzyme name used for the followings: **03**
 i) Liquefaction of starch
 ii) Saccharification of starch
 iii) Dextrinization of starch
- (b) Enlist the applications of immobilized enzymes. **04**
- (c) Discuss the different types of enzyme specificity. **07**
- OR**
- Q.4** (a) Enzymes plays vital role in tenderization and flavour development in meat products. Justify the statement. **03**
- (b) How enzyme can be used to develop food products suitable for lactose intolerant people? **04**
- (c) Discuss the International nomenclature system and classification of enzymes. **07**
- Q.5** (a) What do you understand by blue white screening? **03**
- (b) Explain the regulation of Lac operon in the following conditions. **04**
 i) Both glucose and lactose present
 ii) Both lactose and glucose absent
- (c) Explain the purification process of chymosin enzyme. List out the major applications of different enzymes in dairy industry. **07**
- OR**
- Q.5** (a) State the applications of enzyme in brewing industry. **03**
- (b) Highlight on the estimation of amylase enzyme activity. **04**
- (c) Discuss the applications of enzymes in egg processing industry. **07**
