Printed Page:- 03 **Subject Code:- AMTBT0215**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

M.Tech

SEM: II - THEORY EXAMINATION (2022-2023)

Subject: Enzyme Technology & Industrial Application

Time: 3 Hours **Max. Marks: 70**

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

1. *This Question paper comprises of* **three Sections -A, B, & C.** *It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.*

2. *Maximum marks for each question are indicated on right -hand side of each question.*

3. *Illustrate your answers with neat sketches wherever necessary.*

4. *Assume suitable data if necessary.*

5. *Preferably, write the answers in sequential order.*

6. *No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.*

SECTION A **15**

1. Attempt all parts:-

1-a. What is an apoenzyme? (CO1) 1

(a) It is a protein portion of an enzyme

(b) It is a non-protein group

(c) It is a complete, biologically active conjugated enzyme

(d) It is a prosthetic group

1-b. In which of the following phenomenon the end product act as co-repressor and repress the synthesis of metabolic enzymes? (CO2) 1

(a) Allosteric regulation

(b) Feedback repression

(c) Feedback inhibition

(d) Regulation by phosphorylation

1-c. What do you mean by sterilization? (CO3) 1

(a) Purification of products

(b) Recovery of products

(c) Elimination of contamination

(d) Formulation of media

1-d. Which of the following process is used to separate insoluble particles from liquids? (CO4) 1

(a) Filtration

(b) Extraction

(c) Drying

(d) Sieving

1-e. Which protease is being used to 'shrink-proof' wool'? (CO5) 1

(a) Pancreatic enzyme

(b) Rennet

(c) Fungal protease

(d) Papain

2. Attempt all parts:-

2.a. What is the role of enzymes in bioprocess engineering? (CO1) 2

2.b. What is decline phase? (CO2) 2

2.c. Define maximum possible yield? (CO3) 2

2.d. What is the importance of rheology in filtration? (CO4) 2

2.e. Name enzymes that can be used to determine the presence of glucose. (CO5) 2

SECTION B **20**

3. Answer any <u>five</u> of the following:-

3-a. What are the chemical methods of enzyme immobilization? (CO1) 4

3-b. Why do enzymes denature at high pH? How may pH affects enzymes? (CO1) 4

3-c. Give detailed note on growth and product stoichiometry. (CO2) 4

3-d. With the help of suitable diagram, explain the process of glycolysis. (CO2) 4

3.e. What are the parameters one should consider while optimizing the process for fermenter? (CO3) 4

3.f. Explain working of affinity chromatography? (CO4) 4

3.g. How is selection done for recombinant enzymes or protein? (CO5) 4

SECTION C **35**

4. Answer any <u>one</u> of the following:-

4-a. Draw the graph of competitive inhibition and explain its features. (CO1) 7

4-b.	Why are immobilized enzymes more stable? How does temperature affect immobilized enzymes? (CO1)	7

5. Answer any <u>one</u> of the following:-

5-a.	What is degree of reduction, please calculate the degree of reduction for glucose and ethanol? (CO2)	7
5-b.	Discuss citric acid cycle in detail. (CO2)	7

6. Answer any <u>one</u> of the following:-

6-a.	Why enzymatic reaction is avoided in CSTR? Name any **three** industries that use the concept of CSTR. (CO3)	7
6-b.	Describe the different controlling mechanism used in fermenter? (CO3)	7

7. Answer any <u>one</u> of the following:-

7-a.	How centrifugation is different from filtration? (CO4)	7
7-b.	How precipitation technique is helpful in enzyme extraction? (CO4)	7

8. Answer any <u>one</u> of the following:-

8-a.	What is white biotechnology? Describe its need and significance. (CO5)	7
8-b.	Why is pretreatment of biomass required for the production of metabolic products such as enzymes or others? (CO5)	7