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 (2023 - 2024)

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. Which of this vitamin is associated with the coenzyme Biocytin?(CO1) 1

(a) Nicotinic acid

(b) Thiamine

(c) Biotin

(d) Pyridoxine

1-b. Mark the INCORRECT statement about metabolic pathway. (CO2) 1

(a) They show the irreversible pathway

(b) Each one of them has first committed step

(c) They follow the only oxidative process

(d) They are regulated

1-c. Which material is disengaged in the disengagement zone?(CO3) 1

(a) Culture broth

(b) Culture media

(c) Bubbles

(d) Microbes

1-d. Which of the following is not the application of filtration?(CO4) 1

(a) Sterilization of media

(b) Removal of debris

(c) Plasma clarification

(d) Off-gas analysis

1-e. Which of the following enzyme would be used as bleaching agents?(CO5) 1

(a) Alcalase

(b) α-amylase

(c) Serine protease

(d) Cellulase

2. Attempt all parts:-

2.a. Define Michaelis-Menten Kinetics?(CO1) 2

2.b. How can carbon source affect microbial growth?(CO2) 2

2.c. Why media optimization is much needed step in bioprocess engineering? (CO3) 2

2.d. What is stationary phase?(CO4) 2

2.e. Name the enzyme and its source that can be used to determine the presence of urea.(CO5) 2

SECTION B **20**

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

3-a. Explain method of entrapment for enzyme immobilization?(CO1) 4

3-b. Explain encapsulation method for enzyme immobilization?(CO1) 4

3-c. Derive the equation for doubling time for bacteria?(CO2) 4

3-d. Draw the curve for microbial growth if pH of media is changed?(CO2) 4

3.e. Describe three different methods that can be used for optimization of media?(CO3) 4

3.f. Explain the function of filtration equipment?(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 line weaver burk plot for uncompetitive inhibition?(CO1) 7

4-b. What changes occur in Vmax and Km during competitive inhibition?(CO1) 7

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

5-a.	What will be the RQ factor for aerobic reactor?(CO2)	7
5-b.	What will be the RQ factor for anaerobic bioreactor?(CO2)	7

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

6-a.	Write about the different models used in media optimization.(CO3)	7
6-b.	Write down the differences among batch, fed batch and CSTR bioreactor? (CO3)	7

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

7-a.	Write not about tubular bowl centrifuge?(CO4)	7
7-b.	Write note about disck stack centrifuge?(CO4)	7

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

8-a.	What is SSF? Explain with suitable examples.(CO5)	7
8-b.	What is submerged fermentation? Explain with suitable examples.(CO5)	7