Printed Page:- **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 (20..... - 20.....)

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 the nature of an enzyme? (CO1) K2 1

(a) Vitamin
(b) Lipid
(c) Carbohydrate
(d) Protein

1-b. Which of the following has a spiral metabolic pathway? (CO2) K2 1

(a) Glycolysis
(b) Citric acid cycle
(c) Glyoxylate cycle
(d) Fatty acid biosynthesis

1-c. Quasi – steady state in fed batch is when? (CO3) K2 1

(a) Growth rate remains constant
(b) Dilution remains constant
(c) Growth rate changes variably
(d) μ remains constant

1-d. The advantage of cellulose acetate filters is _____ (CO4)K2 1

(a) Recovery of microorganisms
(b) Low throughput

(c) High protein binding

(d) Low flow rates

1-e. Which feature makes enzymes ideal for industrial drug production? (CO5) K2 1

(a) Cost-effectiveness

(b) High selectivity

(c) High temperature stability

(d) Slow reaction rate

2. Attempt all parts:-

2.a. Define Michaelis-Menten Kinetics?(CO1) K1 2

2.b. How can pH affect microbial growth?(CO2) K2 2

2.c. Why media optimization is much needed step in bioprocess engineering? (CO3) K2 2

2.d. What is mobile phase? (CO4) K2 2

2.e. How enzymes can be used for analytical agents? (CO5) K2 2

SECTION-B 20

3. Answer any five of the following:-

3-a. What are the chemical methods of enzyme immobilization? (CO1) K1 4

3-b. Explain method of entrapment for enzyme immobilization?(CO1) K2 4

3-c. What is specific death rate? (CO2) K2 4

3-d. Derive the equation for doubling time for bacteria?(CO2) K3 4

3.e. Draw well labelled diagram of bioreactor? (CO3) K2 4

3.f. Draw diagram for filtration process? (CO4) K2 4

3.g. What is vector? Name any two vectors that we usually use in Lab. (CO5) K2 4

SECTION-C 35

4. Answer any one of the following:-

4-a. Derive equation for uncompetitive inhibition?(CO1) K3 7

4-b. Draw line weaver burk plot for uncompetitive inhibition?(CO1) K3 7

5. Answer any one of the following:-

5-a. What will be the RQ factor for anaerobic reaction?(CO2) K2 7

5-b. What will be the RQ factor for aerobic reactor?(CO2) K2 7

6. Answer any one of the following:-

6-a. Describe the different type of bioprocess engineering with examples? (CO3) K3 7

6-b. Write about the different models used in media optimization.(CO3) K3 7

7. Answer any one of the following:-

7-a. Describe the filtration process with filtration equipment?(CO4) K2 7

7-b. Write about tubular bowl centrifuge?(CO4) K2 7

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

8-a.	Oil spill in sea water can be treated by a bacterium, explain the case study for the same? (CO5) K4	7
8-b.	What is SSF? Explain with suitable examples.(CO5) K3	7

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