

Printed Page:-

Subject Code:- AMTBT0102

Roll. No:

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

M.Tech

SEM: I - THEORY EXAMINATION (2022 - 2023)

Subject: Bioprocess Engineering & Technology

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 the metal is used to make stainless steel? (CO1) 1
- (a) Cr
- (b) Pb
- (c) Mn
- (d) Fe
- 1-b. The long exposure of batch sterilization may lead to (CO2) 1
- (a) Purification of media
- (b) Recovery of media
- (c) Degradation
- (d) Good quality of product
- 1-c. At steady state the rate of oxygen transfer from the bubbles must be (CO3) 1
- (a) equal to the rate of oxygen consumption by the cells
- (b) less than rate of oxygen consumption by the cells
- (c) Greater than rate of oxygen consumption by the cells

	(d) Till equilibrium is achieved	
1-d.	In mammals' insulin is secreted as (CO4)	1
	(a) Enzyme	
	(b) Lipid	
	(c) RNA	
	(d) Pro hormone	
1-e.	Which of the following methodologies is not used to extract an enzyme from the upper phase of aqueous 2 phase system? (CO5)	1
	(a) Addition of salts	
	(b) Desalting	
	(c) Addition of a polymer	
	(d) Generating a new biphasic system	

2. Attempt all parts:-

2.a.	What is the requirement of good raw material? (CO1)	2
2.b.	How one can determine the growth of bacteria in batch culture? (CO2)	2
2.c.	What oxygen transfer coefficient? (CO3)	2
2.d.	What is full form of RSM? (CO4)	2
2.e.	What is ultra centrifugation? (CO5)	2

SECTION B

20

3. Answer any five of the following:-

3-a.	Draw circuit diagram for PID? (CO1)	4
3-b.	What are the applications of PID Controller? (CO1)	4
3-c.	What is the relation between degree of reduction and carbon content? (CO2)	4
3-d.	Write down the formula for heat evolution during growth? (CO2)	4
3.e.	Draw flow pattern in radial flow? (CO3)	4
3.f.	What is induction in metabolism? (CO4)	4
3.g.	Describe type of disc stack centrifugation? (CO5)	4

SECTION C

35

4. Answer any one of the following:-

4-a.	Describe historic development in bioprocess technology? (CO1)	7
4-b.	Draw the diagram of bioreactor with briefly explain each part of it. (CO1)	7

5. Answer any one of the following:-

- 5-a. What is molar heat combustion? How it is important in growth thermodynamic? (CO2) 7
- 5-b. How we calculate degree of reduction for the biomass and substrate consumption during E. coli growth? (CO2) 7
- 6. Answer any one of the following:-**
- 6-a. Describe any two methods for oxygen mass transfer coefficient? (CO3) 7
- 6-b. Why is oxygen transfer very much needed in bioprocess engineering? (CO3) 7
- 7. Answer any one of the following:-**
- 7-a. How mutation and rDNA help in strain improvement? (CO4) 7
- 7-b. Draw flow sheet for strain improvement for secondary metabolites production. (CO4) 7
- 8. Answer any one of the following:-**
- 8-a. Write note about disc stack centrifuge? (CO5) 7
- 8-b. Explain two phase liquid extraction? (CO5) 7