Printed Page:- 03 **Subject Code:- AMTBT0102**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

M.Tech

SEM: I - CARRY OVER THEORY EXAMINATION - AUGUST 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 following is not a Carbon source? (CO1) 1

(a) Blackstrap molasses

(b) Corn molasses

(c) Beat molasses

(d) Yeast extract

1-b. How long does it take for the autoclave to complete its cycle? (CO2) 1

(a) 30-35 minutes

(b) 50 - 60 minutes

(c) 15-20 minutes

(d) 10-15 minutes

1-c. Which of the following is not a rheological property? (CO3) 1

(a) Body and slip

(b) Spreadibility

(c) Surface tension

(d) Viscosity

1-d. Crabtree effect is which type of process? (CO4) 1

(a) Aerobic respiration

(b) Anaerobic

(c) Biomass yield

(d) Oxidative phosphorylation

1-e. Which of the following is use of centrifugal separation? (CO5) 1

(a) Clarification

(b) Skimming

(c) Bactofuge treatment

(d) All of the above

2. Attempt all parts:-

2.a. Why media optimization is much needed step in bioprocess engineering? (CO1) 2

2.b. What is the advantage of batch sterilization over continuous sterilization? (CO2) 2

2.c. How gas flow rate effect the mixing? (CO3) 2

2.d. How bacteria was used for insulin production? (CO4) 2

2.e. Draw the soli separation in disc stack bowl centrifuge? (CO5) 2

SECTION B **20**

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

3-a. Draw flow sheet for manual control a process in fermenter? (CO1) 4

3-b. Name the important constituents of plant cell culture media? (CO1) 4

3-c. What is elemental balance? (CO2) 4

3-d. Draw growth pattern of fungi? (CO2) 4

3.e. Draw graph of different type of fluids in rheology. (CO3) 4

3.f. What is the difference between sequential and co-operative control? (CO4) 4

3.g. What is the importance of cell disruption? (CO5) 4

SECTION C **35**

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

4-a. Describe historic development in bioprocess technology? (CO1) 7

4-b. What are the similarities and differences between the plant cell culturing and animal cell culturing? (CO1) 7

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

5-a.	What is the importance of Stoichiometry of Cell growth and product formation I fermentation? (CO2)	7
5-b.	How growth rate is calculated for microbial growth with time? (CO2)	7

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

6-a.	How antifoam agent effect the bubble in bioreactor? (CO3)	7
6-b.	How scale up of mixing is performed? (CO3)	7

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

7-a.	How lactic acid is produced? (CO4)	7
7-b.	Why strain improvement is necessary? (CO4)	7

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

8-a.	What is phenomena behind chromatography? (CO5)	7
8-b.	How centrifugation is different from filtration? (CO5)	7