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SARDAR PATEL UNIVERSITY

Bachelor of Science (Semester 5) Examination - 2022

US05CMIC24 Fermentation Technology-1

Date: 14/11/2022 (Monday)

Time: 10:00 am to 01:00 pm

Total: 70 Marks

NOTE: Figure to the right indicate full marks of the questions.

Q.1 Multiple Choice Questions:

[10]

1. Secondary screening can give information about

a. The genetic instability in microbial cultures	c. The structure of product. The product may have a simple, complex or even a macromolecular structure
b. Number of products produced in a single fermentation	d. All of the above
2. Which of the operation does not come under upstream processing?

a. Media preparation	c. Effluent treatment
b. Inoculum development	d. Storage of raw material
3. Which of the following is a nitrogen source?

a. Molasses	c. Corn starch
b. Vegetable oil	d. Corn steep liquor
4. Which of the following are ideal characteristic of industrially important organisms?

a. It should be pure	c. It should be genetically stable
b. It should be produces higher yield	d. All of the above
5. The heat labile components of media can be sterilized by

a. Radiation	c. Moist heat
b. Filtration	d. Dry heat
6. The dilution rate D is defined as (Where F = volumetric flow rate, V = total volume of culture in the reactor and μ = specific growth rate)

a. F/V	c. V/F
b. μ/F	d. μ/V
7. What do you mean by k_{La} ?

a. Volumetric oxygen transfer coefficient	c. Henry's law coefficient
b. Volumetric mass transfer coefficient	d. Volumetric Solute transfer coefficient
8. _____ should be present in fermenter to avoid vortex formation.

a. Impeller	c. Sparger
b. Baffles	d. Mechanical seal
9. Podbielnaik extractor is used in

a. Cell disruption	c. Solvent extraction
b. Product finishing	d. Cell separation
10. Which of the following is a Chemical method for the cells rupturing?

a. Milling	c. Homogenization
b. Ultrasonication	d. Osmotic shock

Q.2 Short Answer Questions. (Attempt TEN out of TWELVE)

[20]

1. Define Primary screening.
2. What is downstream processing?
3. What is SSF? Give any one example of it.
4. Enlist the various carbon sources used in formulation of fermentation media.
5. What is the role of inducers in fermentation media? Explain with suitable example.
6. Define Scale down.
7. What is Del factor?
8. Enlist the various types of fermenter.
9. Which factors are affecting the mass transfer of oxygen in fermenter? Enlist it.
10. Draw a labelled diagram of typical growth curve of bacteria in batch cultivation process.
11. Which methods/processes are used for concentrating fermented products?
12. Draw a labelled diagram of plate and frame filters.

Q.3 Enlist the various range of fermentation processes & products and discuss any two in detail. **[10]**

OR

Q.3 A. What is Auxanography? Discuss it. **[05]**

B. Discuss primary screening of amylase producing microorganisms. **[05]**

Q.4 A. Enlist the ideal characteristics of Inoculum. **[05]**

B. Enlist the ideal characteristics of fermentation media. **[05]**

OR

Q.4 Write a note on crude carbon and nitrogen sources used in fermentation media. **[10]**

Q.5 Draw a typical labelled diagram of continuous stirred tank fermenter and discuss the function of its each part. **[10]**

OR

Q.5 A. Write a note on continuous fermentation. **[05]**

B. Discuss the various methods for the determination of KLa. **[05]**

Q.6 Explain in detail about the various techniques used for the disruption of microbial cells. **[10]**

OR

Q.6 Write a note on:

A. Liquid-Liquid Extraction **[05]**

B. Rotary Vacuum filters **[05]**

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