



LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – BIOTECHNOLOGY

THIRD SEMESTER – APRIL 2025



PBT3MC03 – BIOPROCESS AND ENZYME TECHNOLOGY

Date: 29-04-2025

Dept. No.

Max. : 100 Marks

Time: 09:00 AM - 12:00 PM

SECTION A – K1 (CO1)

Answer ALL the questions

(5 x 1 = 5)

1 Choose the best option

- a) Which of the following procedure has a great application in strain improvement?
i) rDNA Technology ii) Conjugation iii) Transformation iv) Transduction
- b) In which of the following fermenters the impellers are replaced by the constant flow of gas?
i) Airlift fermenter ii) Tower fermenter iii) Hollow fibre iv) Perfusion bioreactor
- c) Apoenzymes are
i) Cofactor ii) Complexes iii) Ions iv) Inactive protein
- d) Which of the following is a product obtained by liquid shear?
i) Milk products ii) Meat products iii) Cell suspension iv) None of the above
- e) The EC number of the enzyme lipase is classified under subclass of
i) EC 1 ii) EC 2 iii) EC 3 iv) EC 4

SECTION A – K2 (CO1)

Answer ALL the questions

(5 x 1 = 5)

2 Answer in one or two sentences

- a) Is protoplast fusion same as rDNA technique and differentiate it.
- b) Give the reaction that takes place during alcohol fermentation.
- c) What do you mean by “Trophophase”?
- d) Differentiate induction and repression.
- e) Comment on osmotic pressure

SECTION B – K3 (CO2)

Answer any THREE of the following

(3 x 10 = 30)

- 3 Apply the process of mutation and mutant selection to improve the yield of a microbial strain used in industrial fermentation.
- 4 Describe the basic working principle of an airlift bioreactor. How does it facilitate mixing and aeration compared to other bioreactor types?
- 5 Evaluate the different methods used for sterilizing fermenters.
- 6 Describe mechanism of enzymatic cell disruption.
- 7 Relate with examples the mechanism of enzyme action.

SECTION C – K4 (CO3)

Answer any TWO of the following

(2 x 12.5 = 25)

- 8 Analyse the primary and secondary screening methods of industrially important microorganisms
- 9 Discuss the types of immobilized cell bioreactors.
- 10 Categorize the factors that affect enzyme activity.
- 11 Correlate physical methods of cell disruption with examples.

SECTION D – K5 (CO4)

	Answer any ONE of the following (1 x 15 = 15)
12	Evaluate the key structural components of a fermentor. Discuss how each component contributes to the overall efficiency of the fermentation process.
13	Derive Michaelis Menten equation to determine the rate of enzyme reaction.

SECTION E – K6 (CO5)

	Answer any ONE of the following (1 x 20 = 20)
14	Evaluate and compare various strain improvement methods in terms of their effectiveness for enhancing yield and performance in industrial microorganisms.
15	Write the steps involved in production of amylase and comment on its significance.

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