LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – **BIOTECHNOLOGY**

THIRD SEMESTER – **NOVEMBER 2023**

PBT3MC03 – BIOPROCESS AND ENZYME TECHNOLOGY

Date: 04-11-2023   Dept. No.   Max. : 100 Marks
Time: 01:00 PM - 04:00 PM

SECTION A – K1 (CO1)

	Answer ALL the questions	**(5 x 1 = 5)**
1	**Choose the best option**	

a)	Silica gel for preservation of industrially important isolates follows the principle of
	  i) desiccation
	  ii) gelation
	  iii) hydration
	  iv) oxidation	

b)	Batch fermentation is _____ system.
	  i) an open
	  ii) a semi-open
	  iii) a closed
	  iv) continuous	

c)	_____aims to ensure product activity and stability.
	  i) Upstream processing
	  ii) Clarification
	  iii) Harvesting
	  iv) Formulation	

d)	Succinate dehydrogenase has an EC number of
	  i) EC 7.1.1.2
	  ii) EC 7.1.1.9
	  iii) EC 7.1.1.12
	  iv) None of the above	

e)	Microbial _____ is used to obtain PUFAs from animal and plant lipids such as tuna oil.
	  i) protease
	  ii) amylases
	  iii) lipase
	  iv) cellulase	

SECTION A – K2 (CO1)

	Answer ALL the questions	**(5 x 1 = 5)**
2	**Answer in one or two sentences**	
a)	Define vitrification.	
b)	Mention one advantage and one disadvantage of solid substrate fermentation.	
c)	What is the function of the impeller in a bioreactor?	
d)	Compare the fastest and slowest enzymes based on the turnover number.	
e)	Define co-enzyme.	

SECTION B – K3 (CO2)

Answer any THREE of the following (3 x 10 = 30)

3	Summarize the desirable characteristics of an industrially significant isolate.
4	Outline the key features of a photobioreactor and add a note on its applications.
5	Explain product purification using gel filtration chromatography technique.
6	Illustrate the classification of enzymes based on their activity with examples.
7	Summarize the application of enzymes in cancer diagnosis.

SECTION C – K4 (CO3)

Answer any TWO of the following (2 x 12.5 = 25)

8	Present an overview of product recovery of an intracellular enzyme.
9	Differentiate between batch and fed-batch fermentation.
10	Compare physical and chemical methods of cell disruption.
11	Illustrate with examples the properties of enzymes.

SECTION D – K5 (CO4)

Answer any ONE of the following (1 x 15 = 15)

12	Discuss media formulation for industrial fermentation.
13	Prioritize the enzymes used in the diagnosis of liver and renal disorders.

SECTION E – K6 (CO5)

Answer any ONE of the following (1 x 20 = 20)

14	Derive the Michalis Menten equation.
15	Design a method for the production and purification of amylase. Add a note on its applications.