U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

October 2024 Supplementary Examinations

Programme: B.E. **Semester: VI**
Branch: BIOTECHNOLOGY **Duration: 3 hrs.**
Course Code: 22BT6PCBPT **Max Marks: 100**
Course: BIOPROCESS TECHNOLOGY

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT-I	CO	PO	Marks
1	a)	You are a Scientist working in a Bioprocess industry. You have been asked to develop a protocol for production of recombinant antibody for the purpose of diagnostics. Suggest suitable method for screening of microorganisms, preservation and strain improvement for the process in brief.	*CO* 1	*PO1*	**10**
	b)	Discuss suitable criteria involved for inoculum transfer for industrial fermentations	*CO* 1	*PO1*	**05**
	c)	Write a note on development of spores on solidified media with a neat diagram.	*CO* 1	*PO1*	**05**
		UNIT-II			
2	a)	Design and draw proportional sketch of a fermenter showing all the dimensions and components with multiblade impeller.	*CO* 2	*PO1*	**10**
	b)	Derive the equation for del factor produced by a certain heat application and time regime. If the fermentation is invaded by a foreign microorganism, what could be the contamination consequences?	*CO* 3	*PO1*	**10**
		OR			
3	a)	Explain any two methods to determine k_La in an aerobic fermentation process.	*CO* 2	*PO1*	**10**
	b)	"Maintenance of aseptic operation and containment is a prior requirement in bioprocess industry". Provide the process flow involved in categorization of process organism and designation of its appropriate level.	*CO* 2	*PO1*	**10**
		UNIT-III			
4	a)	An intracellular protein has to be recovered from yeast source. Suggest appropriate methods of cell disruption techniques for product separation without compromising on the quality of product. What are the criteria for selection of bio-separation techniques?	*CO* 4	*PO1,5*	**10**
	b)	With neat flow diagram explain the production of high volume, low value products taking citric acid as an example.	*CO* 4	*PO1,5*	**10**

			OR			
	5	a)	Suggest a model for the production and recovery of recombinant human coagulation factor VIII.	***CO*** 4	***PO1,5***	**10**
		b)	Explain with diagram the working of a rotary vacuum drum filter for the separation of solid-liquid in downstream processing.	***CO*** 4	***PO1,5***	**10**
			UNIT-IV			
	6	a)	Supercritical fluids have properties of both liquids and gases. Justify the statement by explaining the properties of supercritical fluids and explain how these properties help in separation of proteins.	***CO*** 4	***PO1,5***	**05**
		b)	Distinguish between salting out method and isoelectric point precipitation for separating proteins.	***CO*** 4	***PO1,5***	**05**
		c)	Bacterial cells having 0.8-micron average diameter are being micro filtered in the cross-flow mode using a membrane having an area of 100 cm^2. The steady state cake layer formed on the membrane has a thickness of 10 microns and a porosity of 0.35. If the viscosity of the filtrate obtained is 1.4 centipoise, predict the volumetric permeate flux at a transmembrane 10 pressure of 50 kPa. When pure water (viscosity = 1 centipoise) was filtered through the same membrane at the same trans-membrane pressure, the permeate flux obtained was 10^{-4} m/s.	***CO*** 4	***PO1,2***	**10**
			UNIT-V			
	7	a)	With a schematic representation discuss the design of circulating liquid evaporator crystallizer.	***CO*** 4	***PO1,5***	**10**
		b)	Enumerate freeze drying technique with neat diagrammatic representation. List its advantages.	***CO*** 4	***PO1,5***	**10**

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