Reg. No. : | | | | | | | | | | | | |

Question Paper Code:R3C03

B.E./B.Tech. DEGREE EXAMINATION, NOV 2025

Third Semester

R21UBT303 - BASIC INDUSTRIAL BIOTECHNOLOGY

Biotechnology

(Regulations R2021)

Duration: Three hours | Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1.	What are the categories of unit operations?	CO1 - U
2.	Distinguish between traditional and modern biotechnology.	CO2 - App
3.	Ravi observes his mother using vinegar in cooking. Apply your knowledge and mention two other practical uses of vinegar in daily life.	CO2 - App
4.	Mention any four manufactures of Butanol.	CO1 - U
5.	Solid carrier biofertilizers work well but have some problems- Predict any 4 problem that arise while using them in field.	CO2 - App
6.	List down the qualities of a Good Carrier Material.	CO1 - U
7.	What are the advantages of SCP?	CO1 - U
8.	Mention any 2 uses of lipases in medicinal and diagnosis aspects.	CO1 - U
9.	Define Recombinant DNA technology.	CO1 - U
10.	Differentiate between live vaccine and inactivated vaccine.	CO2 - App

PART – B (5 x 16= 80 Marks)

11.	(a)	A pharmaceutical company wants to produce a specific bioproduct, such as antibiotics or enzymes. Choose suitable microorganisms for the production, explain why they are appropriate, and describe the type of product each organism can produce	CO2 - App	(16)

Or

	(b)	A biotech firm has produced an antibiotic using microbial fermentation. Based on the type of product and its properties, propose a classification of downstream processing steps that should be used for its recovery and purification, and explain why each step is necessary.	CO2 - App	(16)
12.	(a)	Large number of microorganisms have been employed to produce **citric acid** Among all these only *Aspergillus niger* is preferred commonly. Explain this statement along with the production process of citric acid along with the recovery process.	CO1 - U	(16)
		Or		
	(b)	Explain the industrial production acetic acid in detail by *Acetobacter aceti* with a neat block diagram and process flow diagram.	CO1 - U	(16)
13.	(a)	A pharmaceutical company wants to increase riboflavin yield using *Ashbya gossypii*. How would you apply fermentation parameters (pH, aeration, carbon source) to optimize production?	CO2 - App	(16)
		Or		
	(b)	A pharmaceutical company wants to establish large-scale production of erythromycin. Suggest a suitable microbial strain, an appropriate fermentation method, and the downstream processing steps for recovery and purification. Justify your choices with reasons.	CO3 - App	(16)
14.	(a)	If a farmer wants an eco-friendly solution for caterpillar pests, how would you apply biopesticide production knowledge to recommend *Bt* formulations?	CO2 - App	(16)
		Or		
	(b)	A food-processing company needs to convert starch into glucose syrup. Suggest how amylase can be used in this application.	CO2 - App	(16)
15.	(a)	A pharmaceutical company wants to produce human insulin using recombinant DNA technology. Apply your knowledge and explain the process involved.	CO2 - App	(16)
		Or		
	(b)	A biotech company aims to increase the industrial production of streptokinase. You are asked to select or improve microbial strains to enhance enzyme yield, and apply this knowledge to outline the fermentation and downstream processing steps required for large-scale production	CO3 - App	(16)