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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2025

B.Tech-V Semester (BT/BI)

COURSE CODE (CREDITS): 18B11BT511 (04) MAX. MARKS: 15

COURSE NAME: Bioprocess Engineering

COURSE INSTRUCTORS: Dr. Saurabh Bansal MAX. TIME: 1 Hour

Note: *(a) All questions are compulsory.*

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems.

(c) Students are allowed to use a formula sheet (1 page only) signed by me only. An unsigned formula sheet is not allowed.

Q. No.	Question	CO	Marks
Q1.	What is the significance of GMP in bioprocess engineering?	I	1
Q2.	Draw a flow chart representing the key stages in microbial process development.	I	2
Q3.	Define the significance of the following:		2
a)	Growth yield	I	
b)	Saturation Constant (Monod's Constant)	I	
Q4. a)	Compare batch and continuous fermentation from an economic perspective.	II	2
Q4. b)	Which chemostat will you suggest for the recombinant insulin production? Give a suitable reason for the selection.	II	1
Q4. c)	In a chemostat, the dilution rate is 0.2 h^{-1} and μ_{max} is 0.5 h^{-1}, Ks = 0.1 g/L and S = 2 g/L. Evaluate whether the system is at steady state.	II	1
Q5.	Calculate biomass concentration after 5 hours if the initial concentration is 0.1 g/L and $\mu = 0.3\ h^{-1}$.	III	1
Q6. a)	Calculate Ks from a Lineweaver-Burk plot with slope = 0.5 and intercept = 1.5.	III	1
Q6. b)	Estimate residual substrate concentration if initial S_0 = 10 g/L, biomass = 4 g/L, $Y_{x/S} = 0.5$.	III	1
Q7.	Differentiate between		3
a)	Growth-Associated and Non-Growth-Associated Products	III	
b)	Chemostat and Turbidostat	III	