

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION SP2023)

CLASS: BTECH
BRANCH: BIOENGINEERING AND BIOTECHNOLOGY

SEMESTER : VI
SESSION : SP2023

SUBJECT: BE307 BIOPROCESS ENGINEERING

TIME: 02 Hours

FULL MARKS: 25

INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates

		CO	BL
Q.1(a)	Define the role of saturation constant on specific growth?	[2]	1 1
Q.1(b)	Investigate the different types of yield coefficients?	[3]	5 6
Q.2(a)	Discuss the role of carbon sources and specific growth rate?	[2]	2 2
Q.2(b)	Evaluate the role of different physico-chemical properties on microbial growth?	[3]	3 5
Q.3(a)	Find out the elemental balances of C, H, O and N for the given equation: $CH_mO_n + aO_2 + bNH_3 \longrightarrow c CH_aO_bN_\delta + dH_2O + eCO_2$	[2]	4 3
Q.3(b)	Calculate the degree of reduction for C ₁₂ H ₂₂ O ₁₁ , CH ₄ and (CH ₃) ₂ CHOH)	[3]	5 6
Q.4(a)	What is the significance of mass balance?	[2]	1 2
Q.4(b)	Derive the equation for heat transfer during growth of microbes?	[3]	3 4
Q.5(a)	Differentiate between theoretical yield and actual yield?	[2]	2 4
Q.5(b)	Elaborate the different methods of cell growth measurement?	[3]	4 5

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