

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(END SEMESTER EXAMINATION)**

**CLASS: MTECH.  
BRANCH: BIOENGINEERING AND BIOTECHNOLOGY**

**SEMESTER : I  
SESSION : MO/2025**

**SUBJECT: BE515 PROCESS BIOTECHNOLOGY**

**TIME: 3 Hours**

**FULL MARKS: 50**

**INSTRUCTIONS:**

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
  2. Attempt all questions.
  3. The missing data, if any, may be assumed suitably.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
  5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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		CO	BL
Q.1(a)	Describe the mechanism of carbon consumption by microbes in batch mode and provide the relationship between cell biomass and specific growth rate?	[5] 1	1
Q.1(b)	Analyse the different characteristics of microbial products synthesis?	[5] 2	3
Q.2(a)	State the different types of restraints in confinement of whole cells/enzyme?	[5] 2	2
Q.2(b)	Evaluate the process conditions for synthesis of enzyme amylase?	[5] 3	4
Q.3(a)	Define the different techniques employed for removal of microbial contamination? Based on your knowledge, which method is preferable?	[5] 3	2
Q.3(b)	Explain the consequences of failure in air filter during operation of a fermenter? What is X90?	[5] 4	5
Q.4(a)	Define biomass? Investigate the different treatment techniques of biomass to be utilized for synthesis of microbial products?	[5] 1	4
Q.4(b)	Evaluate the process mechanism of production of lactic acid? Mention the role of pyruvate in synthesis of metabolites?	[5] 4	5
Q.5(a)	Describe the process variables and control for synthesis of cephalosporin-C?	[5] 4	3
Q.5(b)	Investigate different stages of fermentation process and role of seed development in product synthesis?	[5] 4	5

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