

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

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

**SEMESTER : I  
SESSION : MO/2024**

**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) | Explain the mechanism of carbon utilization by microbes and the relationship between X and specific $\mu$ ? | [5] 1 | 1  |
| Q.1(b) | Elucidate the significance of C/N ration on product formation?  | [5] 2 | 3  |
| Q.2(a) | Mention the different types of limitations in confinement of whole cells/enzyme?                            | [5] 2 | 2  |
| Q.2(b) | Evaluate the process conditions for synthesis of enzyme alkaline protease?                                  | [5] 3 | 5  |
| Q.3(a) | Define the thermal death kinetics of contaminants and relationship with temperature?                        | [5] 3 | 2  |
| Q.3(b) | Find out the consequences of failure in air filter during aerobic production process?                       | [5] 4 | 4  |
| Q.4(a) | Comments on significance of utilization of biomass for production of ethanol?                               | [5] 1 | 4  |
| Q.4(b) | Evaluate the process mechanism of production of citric acid?  | [5] 4 | 5  |
| Q.5(a) | Describe the process variables and control for synthesis of secondary Penicillin-G?                         | [5] 2 | 2  |
| Q.5(b) | Illustrate the significance of microbial synthesis of vitamins?   | [5] 4 | 3  |

**.....25/11/2024.....E**