

Roll No. 1154212.....

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**B. Sc. (Bio-Technology) 6th Semester
(New Scheme) Examination – May, 2023**

BIOPROCESS TECHNOLOGY

Paper : BT-603

Time : Three hours]

[Maximum Marks : 40

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt five questions in all. Question No. 1 is compulsory and attempts any four questions selecting one question from each Unit.

- (i) What are some advantages of using batch cultures ? 1 × 10 = 10
- (ii) What are the main components of a fermentation system ?
- (iii) What is the purpose of impellers in bioprocess vessels ?
- (iv) What is an airlift bioreactor ?
- (v) How can the $K_L a$ value be calculated experimentally ?

- (vi) What is the role of pH control in misprocessing ?
- (vii) What is Computer Aided Process Control (CAPC) ?
- (viii) What is effluent treatment ?
- (ix) What is microbial production of amylase ?
- (x) What is microbial production of lactic acid ?

UNIT - I

- 2. What is bioprocess technology and what are some examples of products that can be produced using bioprocess technology, and what are their applications in various industries ? 7.5
- 3. What are the basic principles and components of fermentation technology, and how are they used for the production of various products ? 7.5

UNIT - II

- 4. What is the role of Spargers and Baffles in bioprocess vessels, and how do they influence the oxygen transfer rate and microbial growth kinetics ? 7.5
- 5. What are the key principles and considerations in media preparation for upstream processing, and how do they impact the quality and yield of the final products ? 7.5

UNIT – III

6. What is the mass transfer coefficient, and how is it used to quantify the rate of oxygen transfer in bioprocess technology and what are their advantages and limitations ? 7.5
7. What is the importance of bioprocess measurement and control systems, and how do they impact the efficiency and effectiveness of bioprocess technology ? 7.5

UNIT – IV

8. What is downstream processing, and why is it a critical part of bioprocess technology for the recovery and purification of biological products ? 7.5
9. What is microbial production, and how is it used to produce biological products such as ethanol and Single Cell Proteins ? What are the key factors that impact its yield and quality ? 7.5
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