18BT71

USN

Seventh Semester B.E. Degree Examination, Feb./Mar. 2022
Bioprocess Engineering

Time: 3 hrs.   Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1   a.   Distinguish different types of fermentation.   **(10 Marks)**
    b.   Analyze features of various modes fermentation.   **(10 Marks)**

OR

2   a.   Correlate and analyze relationship between specific growth rate of a microbial population and the substrate concentration.   **(10 Marks)**
    b.   Establish a strategy to design and develop fermentation relevant for bio-processing.
                                                                                        (10 Marks)

Module-2

3   a.   Develop a plan for optimizing secondary metabolite production.   **(10 Marks)**
    b.   Analyze the factors affecting secondary metabolite production.   **(10 Marks)**

OR

4   a.   How are the monoclonal antibodies produced using hybridoma technology?   **(10 Marks)**
    b.   Develop a bioreactor consideration for animal cell culture with reference to therapeutic proteins.   **(10 Marks)**

Module-3

5   a.   Why downstream processing is important in bioprocess industries?   **(10 Marks)**
    b.   What are the problems and requirements of downstream processing?   **(10 Marks)**

OR

6   a.   Develop a strategy to cut the cost of bio-processing.   **(10 Marks)**
    b.   Illustrate cell disruption method used for intracellular release.   **(10 Marks)**

Module-4

7   a.   How knowledge of membrane-based separation theory can be used to product purification in bioprocess industry?   **(10 Marks)**
    b.   Critically evaluate to protein precipitation techniques.   **(10 Marks)**

OR

8   a.   How aqueous two phase extraction method is applied to purify proteins in bioprocess industries?   **(10 Marks)**
    b.   Illustrate an idealized phase diagram to separate proteins using supercritical fluids. **(10 Marks)**

Module-5

9 How following chromate graphic principles are exploited to purify proteins from the biological source:

    a. Affinity chromatography   **(05 Marks)**

    b. Affinity elution chromatography   **(05 Marks)**

    c. Hydrophobic interaction chromatography   **(05 Marks)**

    d. Ion exchange chromatography   **(05 Marks)**

OR

10 a. Distinguish different electrophoretic techniques.   **(10 Marks)**

    b. Analyze the analytical and preparative perspectives of high performance chromatography.   **(10 Marks)**

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