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Fifth Semester B.E. Degree Examination, June/July 2023
Biochemical Engineering

Time: 3 hrs.

Max. Marks: 100

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

Module-1

1 a. Discuss Whitakers five kingdom classification. **(05 Marks)**
b. Discuss the role of chemical engineer in bioprocess industries. **(05 Marks)**
c. With a neat diagram, explain Prokaryotic and Eukaryotic cell. **(10 Marks)**

OR

2 a. Discuss various methods employed in controlling of microorganisms in industries and research laboratories. **(10 Marks)**
b. Elaborate on development of bioprocess engineering and technology. Discuss in detail. **(10 Marks)**

Module-2

3 a. Distinguish between DNA and RNA. Give their function and significance in the maintenance of life sciences/processes. **(10 Marks)**
b. Explain the working of enzymes. In detail, classify the enzyme by international method. **(10 Marks)**

OR

4 a. What are carbohydrates? Discuss the important characteristics/properties/applications of any two compounds in monosaccharide's, and polysaccharides. **(12 Marks)**
b. Derive a MM-Model by using rapid equilibrium approach. **(08 Marks)**

Module-3

5 a. How do you determine the MM kinetic parameters experimentally? Briefly explain. **(06 Marks)**
b. Develop a model for uncompetitive inhibition. State all assumptions. Draw the sketch V vs S. **(14 Marks)**

OR

6 a. Derive a rate expression of p^H effect on enzymatic reaction. And also draw the sketch effect of p^H over the activity do enzyme. **(10 Marks)**
b. Discuss various methods of enzyme immobilization. Also write the applications in industries and its demerits. **(10 Marks)**

Module-4

7 a. Enumerate the advantages and disadvantages over batch and continuous sterilization. **(08 Marks)**
b. Derive optimum dilution rate and washout condition in ideal chemostat of continuous culture. **(12 Marks)**

OR

8 a. Develop a model for a logistic equation and also draw the logistic growth curve. **(10 Marks)**

b. Explain the operation and maintenance of continuous stirred tank bioreactor. Draw a neat sketch. **(10 Marks)**

Module-5

9 a. Discuss strategies and steps involved in product purification. **(10 Marks)**

b. Explain any two types of chromatographic methods (principles, operation, sketch). Give its applications. **(10 Marks)**

OR

10 a. In detail, explain the cell disruption methods to release intracellular products/proteins. **(16 Marks)**

b. Explain the principle and operation of any one membrane separation method. **(04 Marks)**

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