GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII(NEW) EXAMINATION – SUMMER 2019

Subject Code:2180408   **Date:09/05/2019**

Subject Name:Biochemical Engineering-II

Time:10:30 AM TO 01:00 PM   **Total Marks: 70**

Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Notations / abbreviations have conventional meaning and needs no clarification.**

                                                MARKS

Q.1 **(a)** Explain the term- lumped parameter, with an example. **03**

(b) Explain the calculations for working capital and fixed capital investments, in context to Biotech industries. **04**

(c) Adsorption of an organic solute on activated silica gel gave the following data after equilibrium. **07**

S (mg/cm^3)	Ca (mg/g)
0.089	0.026
0.066	0.0225
0.047	0.021
0.037	0.018

Fit the data to an adsorption isotherm and calculate rate constant.

Q.2 **(a)** How SIMULINK is used for prediction of output of a reactor system through control function? **03**

(b) Write a note on: dispersions in FIA **04**

(c) Explain in detail about cell disruption techniques. **07**

OR

(c) Explain the types of protein precipitations. **07**

Q.3 **(a)** What is the meaning of distributed parameter model. **03**

(b) Write a note on: Enzyme Electrode **04**

(c) Enlist the applications of liquid-liquid extraction process. **07**

OR

Q.3 **(a)** Give the application of MS. **03**

(b) What are the boundary conditions? Are they constraints in one way? Comment. **04**

(c) Derive the suitable equation to describe the population model. Make a list of independent and dependent variables. **07**

Q.4 **(a)** Write the principle of MALDI-TOF-MS. **03**

(b) What is structured model? Explain. **04**

(c) Explain supercritical fluid extraction. **07**

OR

Q.4 **(a)** Which "ions" are "exchanged" in ion-exchange chromatography? **03**

(b) Why drying is a finishing operation? Justify. **04**

(c) Compare and contrast : sedimentation and centrifugation **07**

Q.5 **(a)** What are the factors governing sedimentation? **03**

(b) Give an idea of continuous filtration assembly with diagram. **04**

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(c) Narrate the uses and principles of affinity chromatography. **07**

OR

Q.5 **(a)** Compare and comment of disruption of bacterial and fungal cell. **03**

(b) What is the Schulze-Hardy rule? Where can you use it? What is its limitation? **04**

(c) Discuss on gel permeation chromatography. **07**

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