Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII (NEW) - EXAMINATION – SUMMER 2018

Subject Code: 2180408 **Date: 30/04/2018**

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)**	What are the objectives of downstream processes?	**03**
	(b)	What are the categories of microbial product that can be recognized economically?	**04**
	(c)	Draw a neat diagram showing parts of biosensor; explain the function of each of them.	**07**
Q.2	**(a)**	How MATLAB is used for bioprocess data handling?	**03**
	(b)	Write a note on: microbial electrode for biosensor	**04**
	(c)	What is metastable region in crystallization? What does it indicate? Explain the nucleation stage.	**07**
		OR	
	(c)	Explain the set up of electrodialysis. Write three application of it in biotechnology.	**07**
Q.3	**(a)**	What is SIMULINK?	**03**
	(b)	Write a note on: FIA	**04**
	(c)	Make a comparison of various downstream processes from economy point of view.	**07**
		OR	
Q.3	**(a)**	Discuss the principle of Mass spectrometry.	**03**
	(b)	Show just a tree view to exhibit the classification of models.	**04**
	(c)	Explain the media optimization technique and its importance.	**07**
Q.4	**(a)**	Give the application of FTIR and GC-MS.	**03**
	(b)	What is selective extraction? Explain.	**04**
	(c)	The lab scale experimental data for the adsorption of an antibiotic on activated carbon are as follows.	**07**

S(mg/cm^3)	Ca (mg/g)
0.3	0.15
0.12	0.12
0.04	0.095
0.018	0.08
0.006	0.06
0.001	0.045

Find out to which Adsorption isotherm, the data fit.

OR

Q.4 **(a)** What principle govern the precipitation process? **03**

(b) Discuss dissociative extraction. **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)
0.139	0.03
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.5 **(a)** Give the principal of sedimentation. **03**

(b) Enlist the types of separator in centrifuge, with its specific use. **04**

(c) Write a note on: High speed ball mills **07**

OR

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

(b) What is the significance of Schulze-Hardy rule? **04**

(c) With the sketch, discuss the Ion exchange chromatography. **07**

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