Karunya University
(Karunya Institute of Technology and Sciences)
(Declared as Deemed to be University under Sec.3 of the UGC Act, 1965)

End Semester Examinations - 2015-16 Even Semester - May 2016

14BT2020 Downstream Processing

Set B

Time : 3 hrs
Total Marks: 100

1. Discuss in detail the chemical and enzymatic method of cell disruption with a neat diagram. (20 marks)

OR

2. A small test filtration of auromycin crystals in an acetone suspension uses a filter medium of negligible resistance. It gives the following date

t(sec)	V (liters)
10	0.500
20	0.707
30	0.866

In finding these data, we have used a filter with 89cm^2 area and a pressure drop of 2.6mof water. We now plan to filter a much larger crop of crystals containing 7300 liters of solvent by using a filter of 1.3m^2 . However, this larger crop has an a concentration of 0.28g/100 cm^3 solvent, less than that in our test filtration, which is 0.34g/100$cm^3$of solvent. How long will it take to filter this new crop at the same pressure drop? (20 marks)

3. Explain in detail the different isotherms involved in adsorption with necessary derivations and diagrams. Give its applications in downstream processing. (20 marks)

OR

4. a. How will you extract the desired compound from the given feed using counter current flow column extractor. Explain the process with a neat diagram. (15 marks)

b. Draw the block diagram for batch extraction and give a brief account on it. (5 marks)

5. A bowl centrifuge is used to concentrate a suspension of E coli prior to cell disruption. The bowl of this unit has an inside radius of 12.7cm and a length of 73.0cm. the speed of the bowl is 16000r/min and the volumetric capacity is 200litres/ hour. Under these conditions,the centrifuge works well.

a. Calculate the settling velocity vg for the cells. (8 marks)

b. after disruption the diameter of debris is about one half of the original cell diameter and the viscosity is increases four times. Estimate the volumetric capacity of this same centrifuge operating under these new conditions. (8 marks)

C. Write short note on application of centrifuge in downstream processing (4 marks)

OR

6. Explain in detail the different types of continuous flow column extractor with a neat diagram and state its applications. (20 marks)

7. Give a detailed account on Affinity and size exclusion chromatography with a neat diagram and its importance in purification of compounds. (20 marks)

OR

8. i. Give a brief account on principle and process of Lyophilization (10 marks)

ii. Give an account on : Dialysis and Pervaporation (10 marks)

9. Give a detailed account on theory of drying and equipments with suitable examples. (20 marks)

Wishing you All the Best