Code: R7412303

R07

B.Tech IV Year I Semester (R07) Supplementary Examinations, May 2013

DOWNSTREAM PROCESSING

(Biotechnology)

Time: 3 hours Max. Marks: 80

Answer any FIVE questions
All questions carry equal marks

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1. (a) Explain how problems and requirements associated with high value low volume products.
   (b) Name and explain briefly about the different separation processes used in bio-separations.

2. Describe the physico-chemical basis of bio-separation with special reference to citric acid production.

3. (a) What are the bio-separation techniques used for removal of the cell debris?
   (b) Write in detail about the sedimentation.

4. (a) Write in detail about the classification of membrane separation processes.
   (b) Differentiate between reversible and irreversible fouling.

5. (a) What is integrated bioprocessing? Draw a neat schematic diagram for a known compound of your interest.
   (b) What do understand about the Hofmeister solutes and write their effectiveness in precipitation process?

6. (a) Explain in detail about the electrophoresis.
   (b) Estimate the double layer thickness in a 0.005 M solution of NaC1 at 25 ℃. It is given that at 25℃, dielectric constant of the medium $€ = 78.30$.

7. A liquid chromatograph using 20 μm silica gel is separating acetonaphthalene (A) from dinitronaphthalene (D). K values are K_A = 5.5 K_D = 5.8 in a solvent which is 23% methylene chloride, 77% pentane. With an interstitial velocity of 1.0 cm/sec, H is measured as 0.12 cm. We desire a resolution of R = 1.0. What column length is required?

8. What is pervaporation? Explain briefly about the pervaporation process with governing equations as well as mass transfer mechanism and its applications in biotechnology.

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