

Total No. of Pages : 02

B.Tech.(BT) (2012 to 2017) (Sem.-7)

Subject Code : BTBT-702

M.Code : 71844

Max. Marks : 60

1. **SECTION-A is COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **FIVE** questions carrying **FIVE** marks each and students have to attempt **ANY FOUR** questions.
3. **SECTION-C** contains **THREE** questions carrying **TEN** marks each and students have to attempt **ANY TWO** questions.

1. Write briefly :

- a. Selection criteria for downstream processing of a fermentation product.
- b. Sedimentation coefficient of biological macromolecules.
- c. Define 'Selectivity Factor'.
- d. Enlist various methods used for precipitation of proteins.
- e. Name **any two** flocculating agents.
- f. Salting-in and salting-out phenomenon for protein purification.
- g. Isoelectric focusing.
- h. Ultrafiltration.
- i. Define the term 'Partition Coefficient'.
- j. Principle of capillary electrophoresis.

SECTION-B

2. Describe the process design criteria for various classes of bio-products.
3. Explain the effect of pressure drop on cake resistance in a batch filtration. What is the effect of compressible cake formation on filtration process?
4. Explain the principle of centrifugal separation. Mention the important features of tubular bowl centrifuge along with a neat sketch.
5. What are adsorption isotherms? Explain the adsorption in fixed beds.
6. A colloidal suspension of clay became clear upon being allowed to stand undisturbed for 5 minutes in ethanol at 20°C. The height of the suspension in the vessel was 45 cm and the specific gravity of montmorillonite is known to be 1.92 g/cm³. The viscosity of ethanol at 20°C was calculated to be 1.2 centipoises. Estimate the average diameter of clay particles.

SECTION-C

7. Define “*crystallization*”. Explain various phases of a crystallization process. Derive the relationship between size and population density of crystals formed during continuous crystallization.
8.
 - a. Write a complete note on working principle, instrumentation and characteristics of a chromatographic techniques exclusive for protein separation. Also mention some matrices used for large-scale chromatography.
 - b. Define ion-exchange and Principle of ion-exchange chromatography. Mention the applications of ion-exchangers.
9. Comment on following (also provide the necessary sketch) :
 - a. Two phase extraction process
 - b. Dialysis

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.