

# **AMB20 DOWN STREAM PROCESSING**

## **UNIT-1 BIOMOLECULES OF COMMERCIAL IMPORTANCE**

Ethanol, citric acid, lysine, steroids, penicillin, dextran, trehalose, subtilisin, chymosin, vitamin B12, hepatitis B vaccine, insulin, erythropoietin, monoclonal antibodies.

## **UNIT-2 TECHNIQUES AND INSTRUMENTATION**

Filtration, centrifugation, aqueous two phase system, ion exchange chromatography, gel permeation chromatography, affinity chromatography, spectrometry, automation, bioassay, automated sequencers, mass spectrometry, ORD, CD

## **UNIT-3 PROTEINS FROM MICROBES, PLANTS AND ANIMAL SOURCES BY CLASSICAL AND MODERN BIOTECHNOLOGY**

Recombinant versus non-recombinant proteins, Microorganisms as source of proteins, Protein production in genetically engineered microorganism such as E. coli, yeast and fungi, Proteins from plants, Production of heterologous proteins in plants, Animal tissues as protein source, production in transgenic animals, animal cell culture, insect cell culture.

## **UNIT-4 LARGE SCALE PROTEIN PURIFICATION**

Production of factor VIII, t-PA, hepatitis B, Asparaginase, insulin, interferon alfa, glucose oxidase, horse radish peroxidase, Alfa amylase, subtilising, lipase, casein, whey protein concentrate.

## **UNIT-5 A GENERAL STUDY OF VARIOUS CLASSES OF COMMERCIAL PROTEINS**

Blood products, vaccines, therapeutic antibodies and enzyme hormones and growth factors, interferon, interleukins, industrial enzymes, non-catalytic industrial proteins.

## **UNIT-6 A GENERAL STUDY OF COMMERCIAL PRODUCTS OTHER THAN PROTEINS**

Bulk organics (ethanol), Biomass (Baker's Yeast), Organic acids (Citric Acid), Amino Acids (L-Lysine), Microbial Transformations (Steroids), Antibiotics (Penicillin), Extra Cellular Polysaccharides (Xanthan Gum), Nucleotides (5-GMP), Vitamins (B12), Pigments (Shikonin)

### **Reference Books**

1. Protein: Biochemistry and Biotechnology by Gary Walsh (2002 John Wiley & Sons Ltd.)
2. Process Biotechnology Fundamentals by S.N. Mukhopadhyay (2001). Viva Books Private Limited.