

Principle paper BT 201 Bioprocess and biochemical engineering

Section I

Unit 1

- 1.1. Introduction to bioprocess technology; Screening, preservation and improvement of industrially important microorganisms, Inoculation development for fermentation process for different types of microorganisms. .
- 1.2. Raw material and media formulation for fermentation process; Influence of environmental factors on growth and product formation;
- 1.3. ,Bioreactor design and different types of bioreactors , Batch, fed batch and continuous cultivation. Solid state cultivation ,Sterilization kinetics, sterilization of media and fermentor.
- 1.4. Microbial growth kinetics.

Unit 2

- 2.1. Agitation, aeration and mass transfer of oxygen.
- 2.2. Control of process parameters: Measurement of process parameters like pH , temperature, DO, foam
- 2.3. Instrumental process control, two position and proportionate control
- 2.4. Biosensor and enzyme probe, microprocessor based control systems.
- 2.5.

Section II

Unit 3

- 3.1. Scale up of bioprocess.
- 3.2. Down stream processing-cell separation, cell disintegration and product purification.
- 3.3. Immobilization of enzyme, cell and their applications.
- 3.4. Production of secondary metabolites.

Unit 4

- 4.1. Industrial production of penicillin, streptomycin., amylase, lipase and protease.
- 4.2. Industrial production of citric acid, acetic acid, alcohol based liquors, acid Vitamins, Glutamic acid, lysine, alkaloids.,
- 4.3. Production and applications of SINGLE CELL PROTEINS., mushroom cultivation, steroid transformation, Flavones.
- 4.4. Industrial production of dairy products - Cheese. Production and application of biopolymers.

References:

1. Biotechnology: Rehm and Reid
2. Comprehensive Biotechnology: Murray Moo Young
3. Economic Microbiology (series): A.H. Rose
4. Microbial Physiology: Moat and Foster