**Subject Code : P8MB12**

## Core Course XII (CC) – Bioprocess technology

### Unit I – Industrially important microbes and their development

Screening methods for industrial microbes – detection and assay of fermentation products – classification of fermentation types – strain selection and improvement. Mutation and recombinant DNA techniques for strain development.

### Unit II – Fermenter – types and function

Fermenters – Basic functions, design and components – asepsis and containment requirements – body construction and temperature control – aeration and agitation systems – sterilization of fermenter, air supply, and medium; aseptic inoculation methods – sampling methods, valve systems – a brief idea on monitoring and control devices and types of fermenters.

### Unit III – Food microbiology

Microbiology of fermented milk – starter cultures, butter milk, cream, yoghurt, kafir, kumiss, acidophilus milk and cheese. Microbes as sources of food (*Spirulina*, *Saccharomyces cerviceae*, *Rhizopus* sp.). Food and water borne infections and food microbial poisoning. Food sanitation in food manufacture and in the retail trade; Food control agencies and its regulations.

### Unit IV – Large scale fermentation

Fermentation in batch culture: Microbial growth kinetics, measurement if growth (cell number, direct and indirect methods) growth and nutrient, growth and product formation, heat evolution, effect of environment (temperature, pH, high nutrient concentration) media formulation. Sterilization, kinetics of thermal death of micro-organisms, batch and continuous sterilization. (All in relation to fermentation).

### Unit V - Legal protection and IPR

GATT and IPR, forms of IPR, IPR in India, WTO ACT, Convention on Biodiversity (CBD), Patent Co-operation Treaty (PCT), forms of patents and patentability, process of patenting, Indian and international agencies involved in IPR & patenting, Global scenario of patents and India's position, patenting of biological materials.

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Tortora, G.J., Fernke, B.R. and Case, C.L. (2001), Microbiology – An Introduction, Benjamin Cummings.

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