

B.Sc. III (2004-2005)**INDUSTRIAL MICROBIOLOGY****1st Paper****Agricultural Microbiology, Pest and Sanitary Management**

1. Soil fertility and management of agricultural soil influence of available N_2 on soil fertility.
 - (i) Crop rotation.
 - (ii) Soil management practices.
2. Microbial disease in crop -
 - (i) Symptoms of plant diseases and mechanism of microbial pathogenicity.
 - (ii) Transmission of plant pathogens.
 - (iii) Viral disease. (Cucumber Moosaic Virus & Tomating spot)
 - (iv) Bacterial disease. (Brown Rot of Potato & Citrus Canker Disease)
3. Control of crop disease
 - (i) Biological control.
 - (ii) General concentration.
 - (iii) Viral pesticide.
 - (iv) Bacterial pesticide.
4. Solid waste disposals.
 - (i) Sanitary land fills.
 - (ii) Composting (manure formation).
5. Treatment of liquid wastes.
Sewage treatment -
 - (i) Primary, secondary & tertiary treatment.
 - (ii) Distillation.
6. Treatment and safety of water supplies.
 - (i) Disinfection of potable water supplies.
 - (ii) Bacterial indicator of water safety.
 - (iii) Standard for tolerable levels of faecal concentration.

IInd Paper**Fermentation Technology**

1. Fermentor its construction and operation.
2. Criteria for selection of microorganism for fermentation.
3. Production for pharmaceuticals -
 - (i) antibiotics (Penicillin)
 - (ii) Hormones (Insulin)
 - (iii) Vaccine (Anti-hepatitis vacc.)
 - (iv) Vitamin (Vit B₁₂)
4. Production of organic acid - *Citric Acid*.
5. Production of Amino acid - (Lysine)
6. Production of enzyme - *Protease*.
7. Production of fuels -
 - (i) Biogas
 - (ii) Hydrogen gas
8. Microbial production of -
 - (i) Alcohol
 - (ii) Beer
 - (iii) Wine
 - (iv) Vinegar
9. Milk microbiology
10. Food poisoning
11. Types of cheese and its production.

Paper III**Immunology**

1. Introductory idea about history and scope of immunology
2. Blood and its composition
3. Blood Coagulation and clotting factor
4. Immunoglobulins -
 - Types
 - Structure
 - Function
5. Immunization -
 - Active
 - Passive

6. Liposomes and its application in Immunology
7. Interferon
8. Antigens
9. Humoral Immunity
10. Defence mechanism
11. Antigen-Antibody Reaction
 - Agglutination
 - RIA
 - ELISA

IVth Paper

Biotechnology and Genetic Engineering

1. Introductory history and scope of biotechnology.
2. Tools and techniques :-
 - (i) Cloning and vectors (Plasmid, cosmid, Phage, Plasmid)
 - (ii) PCR
 - (iii) DNA ligase
 - (iv) Restriction endonuclease
3. (i) Production of chimeric DNA
 - (ii) Protoplast fusion
4. Hybridoma technology and production of Monoclonal antibody.
5. Transgenic animals and plants.
6. Gene therapy.
7. Biotechnology and Pharmaceutical industries -
 - (i) Penicillin.
 - (ii) Insulin.
8. Biotechnology and Bio fertilizers.
 - Azotobacter.
9. Blotting technique -
 - a. Southern.
 - b. Northern.
 - c. Western.
10. Gene library. (Gene bank)