

BASIC AND FOOD MICROBIOLOGY

Full Marks: 100

1. Introduction & scope of microbiological science. 4
2. Use of different types of microscope. 5
3. Morphology, reproduction and cytology of bacteria, yeast, mould, Rickettsia, virus & protozoa. 12
4. Nomenclature, classification, diagnostic features of major groups. 8
5. Physical and chemical factors influencing the control of microorganisms including thermal death time, Z, F and D value. 10
6. General principal and application of serology and immunology. 8
7. Bacterial nutrition and metabolism. 10
8. Growth, reproduction, transformation, conjugation, transaction, mutation and spore formation of microorganism and study of growth curve. 18
9. Microbiology of meat and meat products, milk and milk products, fruits and vegetables and their products, cereals and their products, egg and egg products, spices and food additives. 25
10. Principles of food plant sanitation. 4
11. Food contamination, infections, intoxication an mycotoxin 10

Practicals:

1. Microscopy and micrometry.
2. Cleaning and sterilization of glasswares.
3. Preparation of nutrient media and technique of inoculation.
4. Staining techniques:- a) Monochrome staining b) Negative staining c) Gram staining d) Acid fast staining e) Spore staining f) Fasule staining g) Flagella staining.
5. Isolation of pure culture.
6. Identification of bacteria: a) Culture characteristics b) Morphological characteristics c) Agglutination test for Salmonella d) Biochemical characteristics e) Acid and gas production from sugar f) Starch hydrolysis g) IMVIC test h) Gelatin liquefaction i) Hydrolysis j) Catalase test.

7. Anaerobic culture method.
8. Growth characteristics of bacteria: a) Direct and plate count method b) Generation time c) Factors influencing-(pH, temp., acid, sugar, and salt etc) the growth of microorganisms, examination of moulds important in foods.
9. Microbiological examination of water, sugar, spice. salt, different types of fresh and processed foods.
10. Microbiological examination of tablewares and kitchenwares.
11. Microbial examination of meat and milk products.

Textbooks:

1. W C Frazier & D.C. Westhoff. *Food Microbiology*. Tata Mcgraw Hill publishing company Ltd. New Delhi.
2. James M. Jay. *Modern Food Microbiology*. CBS publisher and Distributors, New Delhi.
3. Pelczar, Reid & Chan. *Microbiology*.Tata McGraw Hill publishing, New Delhi.
4. Thomas D. Brock and Modigan. *Biology of Microorganisms*.

Reference Books:

1. M.R. Adams & M.O. Moss. *Food Microbiology*. Newage international (P) Ltd. Publisher New Delhi.
2. R.K. Robinson. *Dairy Microbiology* Vol.-I, II Elsevier Applied Science Publishers, London.
3. M.H. Brown. *Meat Microbiology*. Elsevier Applied Science Publishers, London.
4. Betty C. Hobbs. *Food Poisoning and Food Hygiene*.

Practical Books:

- W.T. Harrigan & Margaret E. Mccance. *Laboratory Methods in Food and Dairy Microbiology*.
- S.P. Gupta. *Laboratory Methods in Food and DairyMicrobiology*. Academic Press, London.
- Association of official Analytical Chemists. *Bacteriological Analytical Manual*, 7th edn.
- Maheswari & Debey. *Practical Microbiology*.Tata McGraw Hill Publishing House, New Delhi.
- J.B. K.C. & B.K. Rai, *Experiments in Basic Food Microbiology*., Ekta Book.