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M.A. M.Sc. Microbiology Exam May/June-2018  
Second/Fourth Semester  
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FOR COLLEGE ONLY

(1)

**MB: 401 AGRICULTURAL MICROBIOLOGY**

SS 71-83  
M15  
M16  
M17

**UNIT I**

1. Microorganisms of soil
2. Rhizosphere and phyllosphere microflora
3. Brief account of Microbial interactions: antagonism, symbiosis, mutualism, commensalism, synergism and parasitism.
4. Nutrient cycle : Carbon cycle , nitrogen cycle, phosphorous cycle and sulphur cycle.

**UNIT II**

1. Role of enzymes and toxins in pathogenesis.
2. Fungal diseases of plants: Rusts of wheat, linseeds; late blight of potato; red rot of sugarcane.
3. Bacterial diseases of plants : Citrus canker, blight of rice
4. Viral diseases of plants : Leaf curl of Papaya, vein clearing of lady's finger

**UNIT III**

1. Physical and chemical control of plant diseases.
2. Bacterial control of insect pests : *Bacillus thuringiensis* as bacterial insecticide
3. Viral control of insect pests : Nuclear polyhedrosis viruses (NPV) and cytoplasmic polyhedrosis viruses (CPV)
4. Fungal control of insect pests : Entomopathogenic fungi : *Metarhizium anisopliae*, *Beauveria bassiana*, *Verticillium lecani*, *Hirsutella thompsoni*

**UNIT IV**

1. Storage fungi : Categories of storage fungi, conditions during storage in relation to damage of seeds, harmful effects
2. Mycotoxins and their effect on human being.
3. General idea about quarantine
4. Production of biogas and alcohol from agricultural wastes

**UNIT V**

1. Biofertilizers : Types, production and application
2. Mycorrhizae : Types and their application in agriculture and forestry.
3. Vermicomposting
4. Reclamation of waste agricultural land by microorganisms

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**Reference Books**

1. Soil Microbiology by Prof. N.S. Subba Rao, Fourth edition, Oxford and IBH Publishing CO. PVT., LTD., New Delhi
2. Introduction to soil microbiology. Alexander M. (1977) John Wiley & Sons, Inc. New York.
3. Modern Soil Microbiology, Dirk J, Elias V, Trevors JT. Wellington, EMH (1997) Marcel Dekker INC, New York.

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**MB: 402 FOOD MICROBIOLOGY**

SS 71-13  
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**UNIT I**

1. Microorganisms important in food microbiology: molds, yeast and bacteria –general characteristics, classification and importance.
2. Principles of food preservation, preservation by use of high temperature, low temperature, drying and dessication.
3. Chemical preservatives and additives.
4. Preservation by radiation.

**UNIT II**

1. Factors influencing microbial growth in food: Extrinsic and intrinsic factors.
2. Microbial spoilage of food. Chemical changes caused by the microorganisms during spoilage.
3. Spoilage of fish, meat, poultry, eggs, fruits and vegetables.
4. Detection of spoilage and characterization.

**UNIT III**

1. Classification of food borne diseases.
2. Food borne infections: *Brucella*, *Bacillus cereus*, *Clostridium perfringens*, *Yersinia enterocolitica* and *Escherichia*, *Salmonella* spp.
3. Food intoxication: Staphylococcal intoxication, Clostridial poisoning (*Clostridium Botulinum*).
4. Food adulteration and prevailing food standards in India.

**UNIT IV**

1. Microbiology of Milk: Sources of microorganisms in milk and types of microorganisms in milk.
2. Microbiological examination of milk (standard plate count, direct microscopic count, reductase, and phosphatase test ).
3. Dehydration and pasteurization of milk.
4. Dairy products from microorganisms: Butter, yoghurt and cheese.

**UNIT V**

1. Microorganisms as source of food : Single Cell Protein (SCP)
2. Mushrooms and food value of mushrooms
3. Food conversions : Lactic acid conversions, soyabean conversions and Bakery
4. Microbiological estimation of food : Sample collection, preparation and analysis techniques

**Reference Books:**

1. Food science By Norman N. Potler, Joseph H. Hotchkiss. Fourth edition, CBS Publishers and Distributors, New Delhi
2. Food Microbiology , by William C. Frazier and Dennis C. Westhoff, Fourth edition, Tata McGraw-Hill Publishing Company Limited, New Delhi
3. Modern Food Microbiology by James M. Jay, Fourth Edition, CBS Publishers and Distributors, New Delhi.