

## **SEMESTER-III**

### **PAPER 3.1 Food Microbiology Credit: 5**

Hours: 75

Marks: 50

#### **Group A**

1. Historical introduction of Microbiology. General introduction of Micro-organism Bacteria, Yeast and Fungus: Morphology and composition of cell wall.
2. Bacterial Growth: Different types of culture media, its composition and function of individual ingredients. Kinetics of growth. Batch culture, continuous culture, synchronous culture (definition & brief description). Factors affecting growth.
3. Stains and staining Techniques.: Definition of dyes and stains. Classification of dyes. Principle, theory & different method of staining - Gram Staining, acid-fast staining, spore staining, capsule staining & flagella staining.
4. Control of microbial growth.: Sterilisation and disinfection, by physical & chemical agents. Application of dry heat, moist heat, sound wave, radiation, gases & filtration - physical methods .Application of acids, alkali, alcoholic salts, phenols, soaps & detergents - chemical methods.

#### **Group B**

5. Bacteriology of water .Portability of water. Number & kinds of micro-organisms present in water sample. Coliform bacteria - detection & configuration and its classification. Differentiation of feacal & non-feacal coliform bacteria by chemical test. Purification of water.
6. Microbiology of Milk and Milk product.: Different micro flora present in milk, determination of gradation of Milk, curdling of Milk. Pasteurization of milk & Phoshatase test.Microbial involvement in making cheese & butter, development of typical aroma, ripening of cheese.
7. Microbial food Product: Production of wine & other alcoholic beverages (whisky, rum etc.). Activities of lactic acid & acetic acid bacteria. Production of vinegar, sorbic acid, dihydroxy acetone. Microbial production of organic acids. Microbial production of vitamin B<sub>2</sub> and B<sub>12</sub>. . Methanogenic bacteria and biogas production.

## **Group C**

8. Food Spoilage. Role of microorganisms in spoilage of different kinds of food - cereal & cereal products, sugar and its product, vegetables & fruits, milk & milk products, fish, eggs & meat products, canned food. Sources of contamination, factors responsible & chemical changes due to spoilage. Common techniques applied to prevent spoilage of food.
9. Food Hazards. Food Borne infections and intoxication - their symptoms, mode of action & methods of prevention.
10. Food sanitation, control & inspection.:Microbiology of food plant sanitation. Personal hygiene of food handlers. Water & milk testing, food testing - final product.

## **PAPER 3.2:CLINICAL NUTRITION & DIETETICS Credit 4 Hours 60**

### **Group A (10 marks)**

1. Introduction to diet therapy, therapeutic nutrition & dietetics. Adaptation of normal diet into therapeutic diet giving special reference on modification in feeding technique and constituent. Special feeding methods.
2. Factors influencing patient care, assessment of patient need proper method of feeding the patient.
3. Energy modification including obesity and under weight.
4. Fever and febrile condition.

### **Group B (10 marks)**

5. Incidence, aetiology, pathology, clinical manifestations, complications & nutritional management of the following:
  - a) Lower GI tract disorder (Peptic ulcer, Dumping syndrome, flatulence, constipation, diarrhea & dysentery, Malabsorption syndrome, Tropical sprue, Irritable Bowel Syndrome, Inflammatory bowel disease, Gluten sensitive enteropathy, ulcerative colitis).

b) Liver, pancreas & gall bladder disease.

**Group C (10 marks)**

6. Incidence, aetiology, pathology, clinical manifestations, complications & nutritional management of the following:
- a) Metabolic disorder (Gout, Diabetes, Dyslipidemia).
  - b) Cardiovascular diseases (Hypertension, MI, angina, IHD, hyperlipidemia).

**PAPER 3.3 Research Methodology, Computer Application and Statistics**

**Credit 4**

**Hours 60**

**Group A (10 marks)**

Introducing Research

1. Concept, Objectives and Types of Research
2. Stages of Research
3. Structuring of Research: The Research Design
4. Concepts of variable and attribute
5. Levels of measurement: Nominal, Ordinal, Interval and Ratio
6. Writing a Research Proposal

**Group B (10 marks)**

Collection and Analysis of Data, Report Writing

1. Primary and secondary data. Sources of different types of data
2. Sampling: basic types, their merits and demerits
3. Methods and techniques of data collection: Observation, Interview, Questionnaire and Schedule

4. Hypothesis and testing of hypothesis: Null and alternate hypothesis, types of errors (Type – I and II), Normal Probability Curve (Basic idea), Confidence interval and levels of significance
5. Report writing: guiding principles

### **Group C (10 marks)**

#### Basic Statistics and Computer Application

1. Frequency Distribution: Tally marks, Class Limit, Class Boundary and Frequency Density, Cumulative Frequency Distribution
2. Graphical Representation of Data: (a) Line Diagram, (b) Bar Diagram, (c) Histogram and Frequency Polygon, (d) Pie Chart
3. Measures of Central Tendency: Mean (Only Arithmetic Mean), Median and Mode (Grouped and Ungrouped Data), Relative advantages and disadvantages of different measures of Central Tendency, Relation among the different measures of Central Tendency
4. Measures of Dispersion: Importance of the concept of Dispersion in Research, Absolute and Relative measures of Dispersion. Absolute measures: Range, Mean Deviation , Quartile Deviation and Standard Deviation. Relative measures: Coefficient of Mean Deviation, Coefficient of Quartile deviation and Coefficient of Variation, Students t-test, Analysis of Variance (ANOVA).
5. Application of Computers in Research

**PAPER 3.4 : COMMUNITY NUTRITION****Credit 5****Hours 75****Group A (10 marks)**

1. Concept of community nutrition & community health –Characteristics. Meaning of extension education- scope, importance and characteristics. Formal & Non-formal education.
2. Assessment of Nutritional Status of the Community: -Anthropometric measurement, clinical signs and symptoms, diet survey.
3. Agricultural Production, storage, distribution. Role of science & technology in increasing food production. Nutritional Crisis & Food security.

**Group B (10 marks)**

4. Nutrition Monitoring & surveillance: - Nutrition surveillance, food surveillance, surveillance technique & methods, tools for surveillance, objectives of surveillance, uses of surveillance.
5. Nutritional problems: - different prophylaxis programmes, National Nutritional Policy 2010-main features.

**Group C (10 marks)**

6. Malnutrition: -Economics of malnutrition, causes, vicious cycle of Malnutrition & poverty, Malnutrition & infection. Strategies to combat malnutrition.(National Agencies- ICDS,ANP,SNP,MDM)
7. Nutrition Education: Objectives, imparting nutrition education through Audio-visual Aids. Different types of audio ( lectures, radio) visual(poster, charts, exhibitions, pamphlets, bulletins) & audio-visual aids(Workshop, Television, films, puppet show, drama) –Importance and drawbacks

**Paper 3.5 Food Microbiology Practical****Credit 4****Hours 60**

1. Preparation of culture media for bacteria, yeast and fungus.
  - a) Bacteria - nutrient agar medium
  - b) Yeast – YEPDA medium

- c) Fungus – Czapekdox agar medium & PDA medium.
- 2. Inoculation of bacteria, yeast (*S.cerevisie*) & fungus.
- 3. Staining of bacteria – simple & gram staining.
- 4. Staining of yeast using methylene blue & cotton blue lactophenol.
- 5. Staining of fungus using cotton blue lactophenol.
- 6. Isolation of pure culture of bacteria from foods by
  - a) Streak Plate Method
  - b) Spread Plate Method
  - c) Pour Plate Method
- 7. Microbiological examination of water
  - a) Total colony count
  - b) Test for coliform bacteria
  - c) Tests for foecal and non Foecal colioform bacteria.
- 8. Microbiological examination of air tablewares, & equipments in food plant organization.
- 9. Methylene Blue Reduction Test of milk.

### **PAPER 3.6 COMMUNITY NUTRITION & DIETETICS (Practical)**

**(50 Marks) Credit 4**

**Hours 60**

#### **Group A (25 marks)**

#### **COMMUNITY NUTRITION**

1. Introduction to community nutrition.
2. BMI, Ponderal Index, Broka's Index
3. Assessment of Nutritional Status
4. School Children-Health Assessment
5. Conicity Index
6. Calculation of body frame size

#### **Group B (25 marks)**

#### **DIETETICS**

1. Planning of menus by using exchange list
2. Calculation of ACU for the family- Importance & drawbacks
3. Calculation of REE during different disease conditions-
  - a) Peptic ulcer
  - b) Febrile condition
  - c) Diabetes
4. Calculation of TPN
5. Framingham checklist for determining CHD risk in men & women
6. Diet for weight management