PERIYAR UNIVERSITY
PERIYAR PALKALAI NAGAR
SALEM – 636 011

DEGREE OF BACHELOR OF SCIENCE
CHOICE BASED CREDIT SYSTEM

SYLLABUS FOR - B.Sc. NUTRITION & DIETETICS

FOR THE STUDENTS ADMITTED FROM THE

ACADEMIC YEAR 2012 – 2013 ONWARDS

Semester	Part	Subject Code	Subjects	Hrs/ Week	Credit	Marks			Examination Hours
						CIA	EA	Total	
I	I		Tamil I	6	3	25	75	100	3
	II		English I	6	3	25	75	100	3
	III		Core Paper I	5	5	25	75	100	3
	III		Core Practical I	3	-	-	-	-	-
	III		Allied paper I	4	4	25	75	100	3
	III		Allied Practical I	3	-	-	-	-	-
	IV		Environmental studies	1	-	-	-	-	-
	IV		Value Education	2	2	25	75	100	3
II	I		Tamil II	6	3	25	75	100	3
	II		English II	6	3	25	75	100	3
	III		Core paper II	5	5	25	75	100	3
	III		Core practical I	2	4	40	60	100	3
	III		Core practical II	3	3	40	60	100	3
	III		Allied paper II	4	4	25	75	100	3
	III		Allied practical I	3	2	40	60	100	3
	IV		Environmental Studies	1	2	25	75	100	3
III	I		Tamil III	6	3	25	75	100	3
	II		English III	6	3	25	75	100	3
	III		Core paper III	5	5	25	75	100	3
	III		Core practical III	2	-	-	-	-	-
	III		Allied Paper III	4	3	25	75	100	3
	III		Allied Practical II	3	-	-	-	-	-
	IV		SBEC 1	2	2	25	75	100	3
	IV		NMEC1	2	2	25	75	100	3
IV	I		Tamil IV	6	3	25	75	100	3
	II		English	6	3	25	75	100	3
	III		Core Paper IV	5	5	25	75	100	3
	III		Core Practical III	2	3	40	60	100	3
	III		Allied Paper IV	4	4	25	75	100	3
	III		Allied Practical II	3	2	40	60	100	3
	IV		SBEC II	2	2	25	75	100	3
	IV		NMEC II	2	2	25	75	100	3
V	III		Core Paper V	5	5	25	75	100	3
	III		Core Paper VI	6	5	25	75	100	3
	III		Core Paper VII	6	5	25	75	100	3
	III		Core Practical IV	3	-	-	-	-	-
	III		Core Practical V	3	-	-	-	-	-
	III		Elective I	5	5	25	75	100	3
	IV		SBEC III	2	2	25	75	100	3
VI	III		Core paper VIII	6	5	25	75	100	3
	III		Core Practical IV	3	5	40	60	100	3
	III		Core Practical V	3	5	40	60	100	3
	III		Elective Paper II	6	5	25	75	100	3
	III		Elective paper III	5	5	40	60	100	3
	IV		SBEC IV	2	2	25	75	100	3
	IV		SBEC V	2	2	25	75	100	3
	IV		SBECP1	3	2	40	60	100	3
			Extension activities	-	1	-	-	-	-
				-		-	-	-	-
				-		-	-	-	-
					140	**1135**	**2865**	**4000**	

LIST OF CORE PAPERS

I Physiology and Microbiology

II Food Science

III Nutritional Biochemistry

IV Principles of Nutrition

V Nutrition for Life Span

VI Basic Dietetics

VII Food Service Management

VIII Diet Therapy and Counseling

LIST OF CORE PRACTICALS

I Physiology & Microbiology

II Food Science

III Clinical Nutrition and Food Analysis

IV Nutrition for Life Span and Diet Therapy

V Food Service Management

LIST OF SKILL BASED ELECTIVE COURSES (SBEC)

I Food Preservation

II Food Biotechnology

III Bakery

IV Nutrition for Health and Fitness

V Food Sanitation and Hygiene

VI Food Preservation, Bakery and Adulteration (Practical)

LIST OF ELECTIVE PAPERS

I Food Product Development and Quality Control

II Community Nutrition

III Institutional Project

LIST OF NON MAJOR ELECTIVE COURSES (NMEC)

I Basic Food Science

II Basic Nutrition

Eligibility: Pass in higher secondary examination with Nutrition or Dietetics or Home Science or Chemistry or Biology as one of the subjects.

MODEL PATTERN

THEORY

External Assessment (EA)	Internal Assessment
75 Marks	25 Marks

Question paper pattern for core papers and elective papers

Maximum Marks – 75 Marks

Section A [10 x 2 = 20]

Answer all questions

Section B [5 x 5 = 25]

Internal Choice

Section C [3 x 10 = 30]

Answer any three out of five

Question paper pattern for skill based elective courses

Maximum Marks – 75

Answer all the questions (One question from each unit)

Internal choice [5x 15=75]

Classification of Internal Assessment Structure:

		Marks
Test	-	15
Assignment	-	5
Attendance	-	5
		25 marks

Passing minimum (IA) 40% - 10 marks

Passing minimum (EA) 40% - 30 marks

40 marks

PRACTICAL

External Assessment (EA)	Internal Assessment
60 Marks	40 Marks

Classification of Internal Assessment Structure:

		Marks
Practical	-	25
Record	-	10
Attendance	-	5
		40 marks

Passing minimum (IA) 40% - 16 marks

Passing minimum (EA) 40% - 24 marks

40 marks

SEMESTER – I

CORE PAPER – I **PHYSIOLOGY AND MICROBIOLOGY**

Theory : 5 Hours

OBJECTIVES

To enable the students to

1. Obtain a better understanding of nutrition and dietetics through the study of physiology.
2. Gain knowledge about the role of microorganism in health and disease.

UNIT – I

TISSUES- Classification of tissues, structure and functions of epithelial, muscular, connective and nervous tissue.

DIGESTIVE SYSTEM- Structure of digestive system, digestion and absorption of carbohydrates, proteins and fats.

MUSCULO SKELETAL SYSTEM- Bone and Muscle: Structure and functions.

UNIT – II

BLOOD- Composition, functions and Coagulation of blood- definition, process and factors regulating.

HEART- Structure of heart and blood vessels; Blood pressure- definition and factors affecting; Definitions: Heart rate and cardiac output.

RENAL SYSTEM- Structure and functions of kidneys; Urine: composition and formation.

UNIT – III

REPRODUCTIVE SYSTEM- Structure of male and female reproductive organs, puberty, menstrual cycle, meaning of menopause and structure of mammary glands.

ENDOCRINE SYSTEM- Pituitary, thyroid, parathyroid and adrenal glands: Structure, functions of hormones secreted and their abnormality.

UNIT – IV

BACTERIA- Structure, types, reproduction and nutrition.

VIRUS- Structure and lifecycle of bacteriophage.

YEAST- Structure, reproduction and economic importance.

PROTOZOA- Structure and life cycle of Entamoeba histolytica.

MOULDS- Type, structure and reproduction.

UNIT – V

INFECTIOUS DISEASES- Causes and symptoms of the following:

FOOD BORNE DISEASES- Salmonellosis Botulism, Cholera and Typhoid.

WATER BORNE DISEASES- Gastro enteritis, Diarrhea: Campylobacter and Gardia lamblia.

AIR BORNE DISEASES- Tuberculosis and Pneumonia.

PARASITIC INFECTIONS- Amoebiasis and Malaria.

REFERENCES

1. **Gary.A Thibodeau and Kelvin. T.Patlon, Anthony's** Text Book of Anatomy And Physiology, Seventeeth edition, Mosby Publications, Indiana Print, 2004.
2. **Anne Waugh and Allison Grant Ross and Wilson** Anatomy And Physiology In Health and Illness Elsevier Publication, Ninth Edition, 2005.
3. **Guyton, A.C,** Text Book of Medical Physiology, 4th Edition, W.B. Saunders Co. Philadelphia, 1996.
4. **Frazier, W.C,** Food Microbiology, McGraw Hill Publications, New York, 4th Edition, 1998.
5. **Pelczar, H.J. And Rober. D**, Microbiology, McGraw Hill Publication, New York, 10th Edition, 1998.

SEMESTER –I & II

CORE PRACTICAL – I PHYSIOLOGY AND MICROBIOLOGY

Practical hours

I Semester- 3 hours

II Semester- 2 hours

PHYSIOLOGY

1. Microscopic Study of Different Tissues –Epithelial, Connective and Muscular.
2. Estimation of Haemoglobin.
3. Blood Grouping and Measurement of Blood Pressure.
4. Determination of Coagulation Time of Blood.
5. Microscopic Structure of Heart, Digestive System, Kidney and Reproductive Organs: Ovary, Uterus, Mammary Glands and Testis.
6. Microscopic Structure of Various Endocrine Glands – Thyroid, Pituitary and Adrenal.

MICROBIOLOGY

1. Examination of Yeast, Mould, Protozoa and Pathogenic Bacteria.
2. Examination of Unstained organism – Hanging Drop Preparation.
3. Examination of Stained Organisms- Simple Staining and Gram's Method of Staining.
4. Testing milk for purification- Reductase test for milk and standard plate count.
5. Common Culture Media and Uses
6. Study of Sterilizing Equipment
7. Cultivation of Organism in the Laboratory- Methods and Equipments.

MODEL QUESTION PAPER

PHYSIOLOGY AND MICROBIOLOGY

Time : 3 Hours **Maximum: 75 marks**

PART A (10 x 2 = 20 marks)

Answer all Questions

1. List different types of connective tissues.
2. Where are salivary glands located?
3. What is normal heart rate?
4. Mention any one factor that hastens coagulation of blood?
5. What is hormone?
6. Define Ovulation.
7. Classify Moulds.
8. Name any two viral diseases.
9. Name the causative organism of typhoid.
10. What is food poisoning?

PART B (5 x 5 = 25 marks)

Answer all Questions

11.(a) Give the structure of muscular tissues.

(or)

(b) Explain the digestion of carbohydrates.

12.(a) List the function of blood.

(or)

(b) Draw the structure of heart.

13.(a) Explain the function of placenta.

(or)

(b) Explain fertilization.

14.(a) Describe the structure of a bacterial cell.

(or)

(b) Explain reproduction of molds.

15.(a) Explain Clostridium botulinum food poisoning.

(or)

(b) Explain the causes and symptoms of pneumonia

PART C (3 x 10 = 30 marks)

Answer any three questions out of five

16. Explain the structure of digestive system.
17. Explain the composition and formation of urine.
18. Explain the structure of female reproductive system and menstrual cycle.
19. Describe the structure and lifecycle of bacteriophage.
20. Elaborate any three water borne diseases.

SEMESTER – II

CORE PAPER II **FOOD SCIENCE**

Theory: 5 Hours

OBJECTIVES

To enable the students to

1. Understand the scientific principles underlying food preparation.
2. Develop skill and techniques in food preparation with conservation of nutrients and palatability using desirable cooking methods.

UNIT – I

Food- Definition, classification based on functions and Food pyramid.

Basic food groups – Basic 4, 5, 7 and 11.

Cooking methods – Boiling, steaming, stewing, frying, baking, roasting, broiling, pressure cooking and microwave cooking. Loss of nutrients during cooking.

Sugar cookery – Stages of sugar cookery.

UNIT – II

Cereals – Composition and nutritive value of Rice, Wheat, Ragi, and Oats **Parboiling of rice-** Methods and advantages.

Pulses – Composition, nutritive value, toxic substances, germination process and its advantages.

UNIT – III

Vegetables– Composition, nutritive value, classification, pigments and changes in pigments during cooking.

Fruits- Classification, composition, nutritive value, changes during ripening and browning- enzymatic and non enzymatic.

UNIT – IV

Milk and milk products – Composition and nutritive value, kinds of milk and uses of milk in cookery.

Meat – Nutritive value, factors affecting tenderness of meat and Rigor mortis.

Fish – Classification, nutritive value and selection.

Egg – structure, nutritive value, selection and functions of egg in cookery.

UNIT – V

Fats and oils – Sources, uses, rancidity, smoking point and factors affecting absorption of fats.

Spices and condiments – Role in cookery and their medicinal value.

Beverages – Classification, nutritive value, coffee, tea, cocoa and malted beverages.

REFERENCES

1. Paul and Paulmer, Food Theory and Application – John Wiley and sons, New York, 1972.
2. Swaminathan M., Food Science and Experimental foods, Ganesh and Co., Mafras, Reprint 1979.
3. Manay Shakunthala, N and Shadaksharaswamy M. Foods facts and Principles, New Age International (P) Ltd Publishers, Reprint 2005.
4. Swaminathan M. Essentials of Food and Nutrition, Vol I & II Bappo Publications, 1996.
5. Srilakshmi B. Food Science, New Age International (P) Ltd Publishers, third edition, 2005.
6. Norman N. Potter and Joseph H. Hotchkiss, Food Science, CBS publishers and distributors,, Fifth edition, 1997.
7. Swaminathan M., Food Science, Chemistry and Experimental foods, Bappo Publishers company Ltd, 1997.
8. Usha Chandrasekar, Food Science in Indian Cookery, Phoenix publishers House Private Limited, 2002.

SEMESTER – II

CORE PRACTICAL II **FOOD SCIENCE**

Practical: 3 Hours

I a) Grouping of foods – Basic 4,5,7 and 11

b) Measuring of food – Solids, liquids and butter.

II Sugar and Jaggery – Experimental cookery.

a) Different stages of crystallization of sugar and jaggery, preparation of candy, fondant, mysore – pak.

III Cereals and cereal products:

a) Experimental cookery of cereal: steaming, boiling and pressure cooking.

Separation of gluten content of wheat.

b). Preparations – Idli, Ragi Adai, Tomato rice

IV Pulses:

b) Experimental cookery of dhal – soaked, unsoaked, sprouted; effect of cooking dhal in hard water, soft water and with baking soda.

c) Preparations:-

i) Sambar, kootu, black gram dhal vadai

V Vegetables and Fruits

a). Experimental cookery

i). Vegetables – study on the effect of acid, alkali, heat and time on the colour,

texture and flavor.

ii). Fruits – Enzymatic and non – enzymatic browning and its prevention.

b) Preparations:

i). Vegetable- Avial and vegetable briyani.

ii). Fruits – Fruit salad and apple milk shake.

VI Milk and Milk products:

a). Experimental cookery – coagulation of milk proteins

b). Preparation – Payasam, Mour Kozhambu and Paneer.

VII Egg:

a). Experimental cookery – Factors affecting coagulation of egg protein and foaming.

b). Preparation – Poached egg and omelet.

VIII Fats and oils:

a) Experimental cookery – Determination of smoking point of common fats and oils.

b) Preparation – Puri, potato chips, masal vadai and dough nuts.

IX Beverages:

Preparation of coffee, tea and fruit juices – orange, apple juice

MODEL QUESTION PAPER

FOOD SCIENCE

Time: Three hours **Maximum: 75 marks**

PART A (10 x 2 = 20 marks)

Answer All Questions

1. Define Food Science.
2. List out any four cooking methods.
3. What is meant by body building foods?
4. Mention any four millets frequently used in our diet.
5. What is known as enzymatic browning?
6. Point out any four types of milk.
7. What is meant by Rigor Mortis?
8. Mention any two abuses of spices and condiments.
9. What is smoking point?
10. Write the active principles of tea and coffee.

PART B (5 x 5 = 25 marks)

Answer All Questions

10. a) Classify the food based on nutrients with example.

(or)

b) Explain the importance of parboiling in Rice.

12. a) Enumerate the changes during boiling with vinegar and cooking soda in green leafy vegetable cookery.

(or)

b) Write short notes on skimmed milk and whole milk.

13. a) Explain briefly about the factors affecting tenderness of meat.

(or)

b) How will you select a good egg using house hold method?

14. a) Write short notes on rancidity

(or)

b) Enumerate the uses of spices and condiments in Indian cookery.

15. a) List any four common food items and their adulterants.

(or)

b) Write any two procedures to identify the common adulterant in food items.

PART C (3 x 10 = 30 marks)

Answer any Three out Five

16. Describe in detail about “Basic Seven Food Groups” and justify the seven food groups suitability to our Indian condition.

17. Pulses are referred to “Poor man’s meat.” Comment on this statement with example.

18. What are the preliminary treatments given to vegetables and root crops prior to cooking?

19. Discuss in detail about the changes in meat during any four methods of cooking.

20. List out any eight spices and condiments usually utilized by Indians and explain the reason for the same.

SEMESTER – III

CORE PAPER III **NUTRITIONAL BIOCHEMISTRY**

Theory: 5 hours

OBJECTIVES

This course will enable the students to

- Develop an understanding of the principles of biochemistry.
- Apply the knowledge acquired to human nutrition

UNIT – I

Carbohydrates- Definition, classification.Structure (linear) of Monosaccharides- Glucose, fructose and galactose;

Disaccharides- Maltose, lactose and sucrose;

Polysaccharides- Starch and glycogen.

Metabolism- Glycolytic pathway, electron transport chain and oxidative phosphorylation.

Definition of glycogenesis, glycogenolysis and gluconeogenesis.

UNIT – II

Protein- Definition, classification, structure, physical properties, chemical properties and utilization.

Aminoacids- Types, definition of deamination, transamination and decarboxylation.

Enzymes and co-enzymes- Definition, types, classification and factors affecting velocity of enzyme catalyzed reactions.

UNIT – III

Lipids- Definition, classification and properties.

Metabolism- Oxidation and biosynthesis of fatty acids.

Definitions- Ketone bodies, ketogenesis and ketosis.

UNIT – IV

Introduction to genetic control of metabolism- Nucleic acids-Types, composition, structure, functions, replication and transcription.

Elementary knowledge of biosynthesis of protein.

UNIT – V

Acid – base balance- Acid-base balance in normal health, definition of buffers, principles of buffers, major sources of acid produced in the body, physiological buffer system and role of different buffer systems.

Fluid and electrolyte balance- Maintenance in normal health.

REFERENCES

1. **Pattabiraman. T.N.** Concise text Book of Bio- chemistry, 2nd edition, all India publishers and distributors Regd., 1998.
2. **Deb. A.C.,** Fundamental of Biochemistry, New centrul book agency (p)Ltd, reprint 2004.
3. **Ambika shanmugam,** Fundamentals of biochemistry for Medical students, Karthik printers, 7th edition, 1992.

SEMESTER – III & IV

CORE PRACTICAL III

CLINICAL NUTRITION AND FOOD ANALYSIS

Practical: 2 Hours

1. Qualitative analysis of sugars and amino acids.
2. Determination of urinary phosphorus and urea.
3. Estimation of blood cholesterol and glucose.
4. Determination of moisture, ash and fiber in food.
5. Estimation of calcium, phosphorous, iron and ascorbic acid in food.
6. Estimation of total nitrogen in food.

MODEL QUESTION PAPER

BIOCHEMISTRY

Time: 3 Hours **Maximum:75 marks**

PART A (10 x 2 = 20 marks)

Answer all Questions

1. What is a polysaccharide?
2. Draw the structure of glucose.
3. Define glucolysis.
4. What is meant by ketone bodies?
5. Draw the structure of DNA.
6. Write any two functions of RNA.
7. What is buffers?
8. What is meant by acid base balance?

9. List the types of diabetes mellitus?

10. Write a symptom of galatosemia.

PART B (5 x 5 = 25 marks)

Answer all questions

11.a) Draw the structure of triglyceride and lactose.

(or)

b) Write the classification of amino acids.

12. a) Write a notes on lipolysis.

(or)

b) Describe gluconegenesis.

13. a) Describe the structure of DNA

(or)

b) Write the functions of messenger RNA.

14. a) Write the functions of enzymes.

(or)

b) Write the classification of co enzymes.

15. a)What are the factors that contribute acidity to the body? (or)

b) Write a note on ECF.

PART C (3 x 10 = 30 marks)

Answer any three questions out of five

16. Describe the different types of protein and hierarchies of protein structure.
17. Explain citric acid cycle.
18. Explain the action of enzymes in catalyzing biochemical reactions.
19. Describe the role of different buffer system.
20. Describe the role of hormones in the maintenance of electrolyte balance.

SEMESTER – III

SBEC I **FOOD PRESERVATION**

Theory: 2Hours

OBJECTIVES

To enable the students to

- Understand the principles of preservation.
- Learn about the methods of preservation.

UNIT – I

Food preservation- Importance, principles and methods.

Food spoilage- Types, role of micro organism in causing food spoilage and prevention of food spoilage.

Preservation by using chemicals:- Classification and mode of action.

UNIT – II

Preservation by removal of water- Drying and dehydration**:** Principles, methods (in brief), factors influencing, advantages and disadvantages.

UNIT – III

Preservation by use of high temperature- Canning: Steps, advantages, disadvantages and spoilage of canned food.

Pasteurization and sterilization- Principle and types.

UNIT – IV

Preservation by use of low temperature- Refrigeration: Principle, methods and application.

Freezing: Principle, methods and application; preparation of food for freezing; shelf life of frozen food.

UNIT – V

Preservation by addition of sugar- Jams, jellies and fruit preserves: Procedure, common defects and their causes.

Preservation by addition of salt- Pickling; Curing of meat.

REFERENCES

1. **Sivasankar B.** Food processing and preservation prentice-Hall of India (p)Ltd, 2005.
2. **Frazier W.C, Westhoff D.C,** Food microbiology Tata M.C Graw –Hill publishing company Ltd, 2005.
3. **Vijaya khander,** Text book of food science and technology, Indian council of agricultural research, New Delhi, 2001.
4. **Shirley J.Vangrade, Margy Woodburn,** Food preservation and safety, principles and practice, surabhi publications, reprint 2005.
5. **Manoranjan kalia, Sangita sood,** Food preservation and processing, kalyani publishers reprint 2000.

MODEL QUESTION PAPER

FOOD PRESERVATION

Time: 3 hrs **Maximum: 75 marks**

Answer all Questions

(5x15=75)

1. (a) Importance of and principle involved in food preservation-explain. (or)
   (b) Bring out the role of micro organisms in causing food spoilage.

2. (a) What are the advantages and disadvantages of dehydration?

   (or)

   (b) Explain the role of chemical preservatives in food preservation.

3. (a) Elucidate the steps in canning. (or)

   (b) Explain pasteurization.

4. (a) Bring out the methods and principles of refrigeration. (or)

   (b) Bring out the methods and principles of freezing.

5. (a) Explain the process of preparation of murabba. (or)

   (b) Explain the steps involved in curing of meat.

SEMESTER – IV

CORE PAPER IV **PRINCIPLES OF NUTRITION**

Theory: 5 Hours

OBJECTIVES

To enable the students

- Gain basic knowledge of the different nutrients and their role in maintaining health of the community.
- Develop skills in qualitative analysis and quantitative estimation of nutrients.

UNIT – I

Concept of Nutrition- Definition of nutrition, health, nutritional status and malnutrition.

RDA- Definition, factors affecting RDA and methods used for deriving RDA; Reference man and reference woman- Definition.

Carbohydrates- Functions, maintenance of blood sugar levels, requirement and sources. Dietary fiber- Definition, classification, physiological effects, role of fiber in preventing diseases and sources.

UNIT – II

Proteins- Definition, composition, nutritional classification of proteins and amino acids, functions of proteins, sources, and requirements. Evaluation of protein quality – PER, BV, NPU and Chemical score.

Lipids- Definition, composition, functions, sources and requirements; Essential fatty acids – Definition, functions, sources and effects of deficiency.

UNIT – III

Energy- Definition, units of measurement, determination of energy value of foods by direct and indirect calorimetry and physiological fuel value.

Total energy requirement- BMR: Definition, measurement (direct and indirect calorimetry) , factors influencing basal metabolism; Energy requirement for physical activity: factorial method and indirect calorimetry; Thermic effect of food and factors affecting thermic effects of foods; Factorial method; energy requirement and sources.

UNIT – IV

Macro Minerals- Calcium and Phosphorous- Functions, requirements, sources and effects of deficiency.

Micro minerals- Iron, Iodine, Copper, Fluorine and Zinc- Functions, sources, requirements and effects of deficiency. Sodium and Potassium **–** Functions, sources, requirements and effects of imbalances.

Unit-V

Fat soluble Vitamins – Vitamin A, D, E and K: Functions, requirements, sources and effects of deficiency.

Water Soluble Vitamins – Thiamin, riboflavin**,** niacin, ascorbic acid, folic acid, vitamin B6 and vitamin B12: Functions, requirements, sources and effects of deficiency.

REFERENCES

1. **Sumathi R. Mudambi, Rajagopal, M.V.,** Fundametals of Foods and Nutrition, New Age International (P) Ltd, Publishers, Third edition, 1997.
2. **Srilakshmi B.,** Nutrition Science, New Age International (P) Ltd, Publishers, 2004.
3. **Mangala Kango,** Normal Nutrition, Curing diseases through diet, CBS Publications, First edition, 2005.

4. **Paul.S.,** Text Book of Bio-Nutrition, Fundamental and Management, RBSA Publishers, 2003.
5. **Sue Rodwell Williams,** Nutrition and Diet Therapy, C.V. Melskey Co., 6th edition, 2000.
6. **Swaminathan M.,** Essential of Food and Nutrition, Vol I and II, Bappco publications, Madras, 1996.

MODEL QUESTION PAPER

PRINCIPLES OF NUTRITION

Time : 3 Hours **Maximum: 75 marks**

PART A (10 x 2 = 20 marks)

Answer all Questions

1. Define Nutritional status.
2. Classify fibers.
3. What is EAA?
4. What is NPU?
5. Define Iodine value.
6. List the components of ECF.
7. Define kilo calorie.
8. Define R.Q.
9. What is koilonychia?
10. List the symptoms of thiamine deficiency.

PART B (5 x 5 = 25 marks)

Answer all Questions

11.(a) Define and classify carbohydrate.

(or)

(b) Give the effect of fibre on upper GI tract.

12.(a) Briefly explain functions of protein.

(or)

(b) Give any two biological methods used to assess quality of protein.

13.(a) Explain direct calorimetry for food energy.

(or)

(b) BMR determination by direct calorimetry.

14.(a) Explain hydrolysis of fat.

(or)

(b) Explain function of water.

15.(a) List the functions of vitamin A.

(or)

(b) List the functions of calcium.

PART C (3 x 10 = 30 marks)

Answer any three questions out of five

16. Explain the functions and sources of carbohydrates.

17. Give Chemical & Biological classification of protein.

18. Explain the mechanism involved in maintenance of water balance in body effect of failure in maintenance of water balance.

19. How do you compute energy requirement by factorial method.

20. Illustrate the functions of vitamin C & deficiency.

SEMESTER – IV

SBEC II **FOOD BIOTECHNOLOGY**

Theory: 2 Hours

OBJECTIVES

To enable the students to

- understand the basic principles of biotechnology
- apply the knowledge of biotechnology for the development of new food products

UNIT-I

Introduction to biotechnology.

Genetically modified foods- Definition, examples of GM foods, advantages, disadvantages and safety aspects of foods produced by genetic engineering.

UNIT- II

Food fermentation- Concept of microbial fermentation; fermentation process: Dual and multiple fermentation, continuous fermentation and batch fermentation; factors controlling fermentation.

UNIT- III

Fermented food products- Beer, wine, vinegar, sauerkraut, temph, soya sauce, cheese and bread : Preparation.

UNIT-IV

Enzymes in food processing industries- Principles of enzyme immobilization: Types of immobilization techniques and their importance; Immobilized enzymes in food processing.

UNIT-V

Functional foods and Nutraceuticals- Introduction and concept definition; Classification and therapeutic role of Nutraceuticals.

REFERENCES

1.Mary, k. Schmidl and Theodre, P. Labuza, Essentials of functional foods, Culinary and Hospitality Industry Publication Services, 2000.

2. **Israel Goldberg**, Functional foods, Pharma foods and Nutraceuticals, Culinary and hospitality Industry Publication Services, 2001.

3. **Robert Easy Wildman**, Handbook of Nutraceuticals and functional foods, Culinary and Hospitality Industry Publication Services, 2001.

4. **Owen Pward**, Fermentation Biotechnology Principles, Processes and Products, Prentice H New Jersey, 1989.

5. **Dubey, R.C**. Text book of Biotechnology, S.Chand and Co. Ltd, New Delhi, 2001.

6. **Frazier and West Hoff**, Food Microbiology, Tata Mc Graw Hill Publishing Company Ltd, New Delhi, 1995.

MODEL QUESTION PAPER

FOOD BIOTECHNOLOGY

Time: 3 Hours **Maximum: 75 Marks**

Answer all questions (5x15=75)

1. (a) Explain any 2 methods of fermentation. (or)

   (b) Explain the factors controlling fermentation.

2. (a) What is biotechnology? How is it useful in food industry? (or)

   (b) What are GM foods? Write about the safety aspects of GM foods.

3. (a) Write a note on manufacturing of beer and wine. (or)

   (b) Role of biotechnology in the production of cheese and bread.

4. (a) Explain enzyme immobilization and its importance. (or)

   (b) Bring out the role of enzymes in food processing.

5. (a) Write the importance of functional foods. (or)

   (b) Explain the therapeutic role of Nutraceuticals.

SEMESTER – V

CORE PAPER V **NUTRITION FOR LIFE SPAN**

Theory: 5 Hours

OBJECTIVES

This course will enable the students to

- Understand the physiology of pregnancy and lactation and how these influence on nutritional requirements.
- Understand the process of growth and development form birth until old age.
- Get familiar with the nutritional needs at different stages of growth.

UNIT – I

Principles to be followed in meal planning- Objectives and steps.

Nutrition in pregnancy- Food and nutrient requirements, physiological changes during pregnancy, developmental stages of the embryo, physiological cost of pregnancy and complications in pregnancy.

Nutrition in lactation- Food and nutrient requirements, physiology of lactation, composition of breast milk, influence of mother's diet on the quality and quantity of milk production and breastfeeding practices.

UNIT – II

Nutrition during infancy- Food and nutrient requirements, weaning, types of weaning foods and supplementary foods, changes in growth pattern - height and weight.

UNIT – III

Nutrition in childhood:

Nutrition during preschool age – Food and nutrient requirements, eating habits and behavior, growth, factors inhibiting growth and increment in height and weight.

Nutrition during school-going age- Food and nutrient requirements, factors affecting eating habits, school lunch and mid-day meal program.

UNIT – IV

Nutrition in adolescence- Food and nutrient requirements, changes in growth pattern, puberty, menarche, changes in food habits, nutritional disorders, psychological and peer group pressure on eating habits.

UNIT –V

Nutrition in adulthood- Food and nutrient requirements, changes in consumption pattern: physical, mental and social changes influencing meal pattern.

Nutrition in oldage- Food and nutrient requirements, physical, physiological, biological and psychological changes influencing meal pattern.

REFERENCES

1. **Swaminathan, M.** Advances text book on book on food and nutrition Vol 1 and 2 Bangalore printing publishing Co., Ltd., Bangalore, II ed., 1988.
2. **Fox, B.A., and Cameron, A.G.,** Food science, nutrition and health, Edward Asnold, London, 1995, VI Edition.,
3. **Nato, A.B and Heslin, J.A.,** Nutritional Care of the adult, Macmillan Publication Co., Newyork 1986.
4. **Antia F.P** Clinical Dietetics' and Nutrition, III Edition, Oxford University Press, Bombay 1989.
5. **Srilakshmi. B.,** dietetics, willey Eastem Ltd., NewDelhi, 2003.

6. **Robinson C.H., Lawer M.R., Chenowelth. WIC., and Garwich A.E.,** Normal and therapeutic nutrition, McMillan Publishers Co., Newyork, XVII Edition, 1986.
7. **Suitor, C.J.W and Growely, M.F.,** Nutrition – Principles and application in Health promation, J.B, Lippincott Co., Philadelphia pb, II Edition, 1984.
8. **Gopalan, C. and Ramasasthri, B.V.,** Nutritive Value of Indian foods. NIN (ICMR) 1996.

MODEL QUESTION PAPER

NUTRITION FOR LIFE SPAN

Time: 3Hours **Maximum: 75 marks**

PART A (10 x 2 = 20 marks)

Answer all Questions

1. What is a balanced diet?
2. What is colostrum?
3. Mention two objective of school lunch program.
4. State the clinical signs of Vitamin-A deficiency.
5. List four advantages of breast feeding.
6. Mention the discomforts that arise during pregnancy.
7. What is Anorexia Nervosa?
8. Name the nutritional disorders that occur during old age.
9. Give the RDA for a Pre-School Child.
10. What is RDA?

PART B (5 x 5 = 25 marks)

Answer all Questions

11. (a) Enumerate the points to be considered in introducing weaning food to the infant.

(or)

(b) Write a short notes on vicious circle.

12. (a) Give a short note on Protein Energy Malnutrition.

(or)

(b) Discuss the factors that influence the supplementary feeding programs for pre school children.

13. (a) Comment on the daily nutritional requirements of an adult man.

(or)

(b) Write a short note on eating disorder during adolescence.

14. (a) Discuss the role of hormone in the secretion of human milk.

(or)

(b) Write a short note on complication during pregnancy.

15. (a) Write short note on uses of RDA.

(or)

(b) Give the RDA for lactating women (Secondary worker) and comment on

its significance.

PART C (3 x 10 = 30 marks)

Answer any three questions out of five

16. Write in detail the nutritional requirements during infancy and comment on its significance.

17. Explain the dietary guidelines needed to feed the pre-school children.

18. Discuss the nutritional problems during old age.

19. Discuss in detail the advantages of breast feeding.

20. Explain in detail the dietary guidelines for old people.

SEMESTER – V & VI

CORE PRACTIVAL IV

NUTRITION FOR LIFE SPAN AND DIET THERAPY

Practical hours: 3

NUTRITION FOR LIFE SPAN

1. Planning, preparing and serving a meal for low income family, middle income family and high income family.
2. Planning, preparing and serving a meal for a pregnant woman.
3. Planning, preparing and serving a meal for a lactating woman.
4. (a). Planning, preparing and serving a meal for an infant.
   (b). Planning and preparing an indigenous weaning mix.

5. Planning, preparing and serving a meal for a preschooler.

6. Planning, preparing and serving a meal for a school going child (boy and a girl).

7.(a). Planning, preparing and serving a meal for an adolescent.

(b). Planning and preparation of any five packed lunches.

8. Planning, preparing and serving a meal for an adult (sedentary, moderate

and heavy worker).

9. Planning, preparing and serving a meal for an old age person.

DIET THERAPY

1. Preparation of therapeutic hospital diets- clear liquid, full liquid, soft, light and regular diets.

2. Preparation of diet planned for

a. Obesity and under weight

b. Gastro intestinal disorders – Peptic ulcer, diarrhoea and constipation

c. Febrile condition- Malaria, typhoid and TB

d. Diseases of liver and gall bladder-Hepatitis and cirrhosis.

e. Deficiency disorders- PEM, Iron deficiency anemia and osteoporosis.

3. Planning and preparation of diets for

a. Diabetes mellitus

b. Diseases of cardio vascular system – Atherosclerosis and Hypertension

c. Diseases of kidney and urinary tract –Nephritis and nephrotic syndrome.

d. Cancer and AIDS.

SEMESTER – V

CORE PAPER VI **BASIC DIETETICS**

Theory: 6 Hours

OBJECTIVES

This paper will enable the students to

- Know the principles of diet therapy.
- Understand the modification of normal diet for therapeutic purpose.
- Understand the role of dietitian.

UNIT – I

Diet therapy - Definition, purposes of a therapeutic diet, principles and types of hospital diet : clear fluid, full fluid, soft, light, bland and regular diet.

Dietitian – Types, qualities, qualification and role of dietitian in managing hospital dietary.

UNIT – II

Nutritional care for weight management- Obesity and overweight: Identification, etiology, dietary management and behavioral modifications.

Under weight: Etiology, assessment and dietary management.

Nutritional care for febrile condition – Acute, chronic and recurrent: Malaria, Typhoid and TB – Etiology, symptoms and dietary management.

UNIT – III

Nutritional care for diseases of the Gastro Intestinal tract- Gastric and duodenal ulcer, diarrhoea, constipation, malabsorption syndrome, hemorrhoids, ulcerative colitis, flatulence and steatorrhea – Etiology, symptoms and dietary management.

UNIT – IV

Nutritional care for diseases of liver and biliary system- Viral hepatitis, cirrhosis of liver, cholelithiasis and cholecystitis: Etiology, symptoms and dietary management.

UNIT – V

Nutritional care for deficiency disorders- PEM, Nutritional anemia, vitamin-A deficiency, Iodine deficiency, osteoporosis and osteomalacia- Etiology, symptoms and dietary management.

REFERENCES

1. **Mahan, L.K., Arlin, M.T.,** Krause's Food, Nutrition and Diet Theraphy, W.B. Saunders Company, London Publications, 8th edition, 1992.
2. **Robinson, C.H., Chenoweth, W.L. and Garwivk, A.E.** Normal and Therapeutic Nutrition, MacMillan Publishing Co., 17th edition, 1986.
3. **Raheena, Begum,** A textbook of Foods, Nutrition and Dietetics, Sterling Publishers, New Delhi, 1989.
4. **Joshi, S.A., Nutriton and Dietetics,** Tata McGraw Hill Publications, New Delhi, 2004.
5. **Srilakshmi B.,** Dietetics, New Age International (P) limited Publications, 2004.
6. **Paul. S.,** Textbook of Bio-Nutrition, Curing diseases through diet, CBS publications, first edition, 2005.

MODEL QUESTION PAPER

BASIC DIETETICS

Time: 3 Hours **Maximum: 75 marks**

PART A (10 x 2 = 20 marks)

Answer all Questions

1. What is meant by therapeutic client?
2. List the different types of feedings used in hospitals?
3. Define mal absorption syndrome?
4. What are the foods to be avoided and included for diabetes?
5. What is Lactose intolerance?
6. Explain the metabolic error in Gout?
7. List out the role of dietitian in hospitals?
8. Define obesity?
9. What is meant by regular diet?
10. Give the different types of dietitian?

PART B (5 x 5 = 25 marks)

Answer all Questions

11. (a) List out the factors to be considered in planning a diet for tuberculosis

(or)

(b) Explain the different types of hospital diet?

12.(a) Give the dietary management of constipation?

(or)

(b) Give the causes and symptoms of Gastric Ulcer?

13.(a) Give the dietary management for obesity?

(or)

(b) Give the causes and dietary management of Typhoid.

14.(a) Classify diabetes mellitus?

(or)

(b) Give the etiology and symptoms of cirrhosis of liver?

15.(a) Give in detail about Iodine deficiency.

(or)

(b) Explain the causes of nutritional anemia.

PART C (3 x 10 = 30 marks)

Answer any three questions out of five

16.What are the important points to be considered in planning a therapeutic diet?

17.Give the dietary management for diabetes mellitus?

18.List out three in born errors of metabolism. Give its causes, symptoms and dietary management?

19.Give the role of dietitian in a hospital.

20.Give the causes and symptoms of ulcerative colitis.

SEMESTER – V

CORE PAPER VII **FOOD SERVICE MANAGEMENT**

Theory: 6 Hours

OBJECTIVES

To enable the students

- With the knowledge of various facets of functioning of food service institutions
- With the necessary knowledge to become an efficient manager.

UNIT - I

Catering industry- Definition of catering. Classification of food service institutions according to

a. Function: Profit oriented, service oriented and public health facility oriented.

b. Processing method: Conventional system, commissary system and fast food service systems.

c. Service of food: Self service, tray service and waiter-waitress service.

UNIT – II

Floor planning and layout- Characteristics of typical food service facilities.

Plan of work areas - Receiving, storing, food preparation, cooking, serving, dining, dishwashing, pot and pan washing and garbage disposal : flow space relationship. Working heights and dimensions of work centers.

Equipment – Classification, factors involved in selection, use and care of major equipment.

UNIT – III

Quantity food preparation- Selection, purchasing methods and storage of foods.

Menu planning – Definition, principles involved in planning and types of menus.

Standardization of recipe – Definition, standard recipe format and uses.

Standard portion sizes - Definition, portioning equipments and portion control.

Use of left over foods.

UNIT – IV

Management- Definition, principles and techniques of effective management.

Tools of management- Organization chart, work study and work improvement.

Use of computers in food service establishments.

UNIT – V

Financial management- Principles and methods of food cost control, factors affecting food cost, labor cost, operating cost and overhead cost.

Personnel management- Methods of selection, orientation, training, supervision and motivation of employees.

REFERENCES

1. Sethi, m. and Matha, S. Catering Management – An Integrated approach, wiley Eastern Ltd., New Delhi, II Edition 1993.
2. Branson, J.C. and Lennon, M.Hotel, Hostel and Hospital Housekeeping, EiLBS (Publication) V Edition 1992.
3. Palacio, J.P. Harger, V., Shugart, G. and Theis, M. West's Introduction to food service, MacMillan Publication Co., New York, XVII Edition, 1944.
4. Kotschevar, L.H. and Teerell, M.E., Food service planning, Layout and Equipment, MacMillan Publication co., New York, III Edition, 1985.
5. Splaver, B.R. Successful Catering, Van Norstrand Reinhold, New York, III Edition, 1985.
6. Kinton, R and Cesarani, V., The Theory of Catering ELBS, VII Edition, 1992.
7. Lillicap, D.R and Cousins, J.A. Food and Beverage Service, ELBS, IV Edition, 1994.
8. Maris, M, McCreery, C and Brighton, R. Introduction to catering, Blackwill Scientific Publications, London, 1993.
9. Delfakis, H. Scanion, W.C. and Van Burch, J.B. Food service Management, South Wertern Publication Co., cincinattti, ohio, 1992.
10. Cracknell, H.C. and Nobis, G. Mastering Restaurant Service, Macmillan Master Service, Macmillsn Education Ltd, (pub) London, 1989.

MODEL QUESTION PAPER

FOOD SERVICE MANAGEMENT

Time: 3 Hours **Maximum: 75 marks**

PART A (10 x 2 = 20 marks)

Answer all Questions

1. What is management? List the management functions.

2. What do you mean by grapevine communication?
3. How will you store semi-perishable and perishable foods?
4. What is USDA and FDA? When are they started?
5. What are AP and EP? How will you calculate EP?
6. What is menu planning?
7. What are the two classes of Indian cuisine?
8. Enumerate various aspects for assessing the hygiene and sanitation.
9. What is entrepreneurship?
10. What are CPU, Hardware and Software?

PART B (5 x 5 = 25 marks)

Answer all Questions

11. (a) How hotels are classified? Explain with examples.

(or)

(b) What is HM-HDPE containers? Discuss the advantages of polyethylene containers.

12. (a) Discuss some of the common methods of informal buying.

(or)

(b) List an four advantages of double entry system.

13. (a) What is standard recipe? Highlight its objective.

(or)

(b) What are the different types of portion control equipment? Give some examples for standard serving portions of some dishes.

14. (a) What are the safeguard measures will you suggest to maintain personal hygiene?

(or)

(b) Why are fast food service operations referred to as “fast”? List one recent development that you have observed in fast food service.

15. (a) What are the functions of entrepreneur?

(or)

(b) What are items should be computerized?

PART C (3 x 10 = 30 marks)

Answer any three questions out of five

16. How equipments are classified? Give examples for each and list schedule for care of equipment.
17. Discuss the types of storages to be adopted for different food groups.
18. Why is receiving as a function given utmost important and how raw materials are received
19. What is table service? Explain any five types of table service.
20. In what way entrepreneur precedes manager?

SEMESTER – V & VI

CORE PRACTICAL V **FOOD SERVICE MANAGEMENT**

Practical : 3 Hours

I Standardization of at least 2 recipes in each of the following category

1. Cereal and cereal products
2. Vegetables.
3. Fruits.
4. Meat, chicken and other fleshy foods.
5. Sugar and jaggery
6. Milk and its products.
7. Pulses.
8. Nuts and Oil seeds.

II Planning and preparation of menu for various occasions.

III Preparation of quantity recipes for 20 persons with a main dish, 2side accompaniments and a dessert/soup.

IV Visit to catering establishments (1 in each category) welfare, commercial and transport catering.

NOTE: For practical examinations students have to

1. Calculate the food cost and profit for 5/10/15 portions.
2. Prepare and display single portion.

SEMESTER – V

SBEC III **BAKERY**

Theory: 2 Hours

OBJECTIVES

To enable the students to

- Understand the principles of baking
- Acquire basic knowledge on bakery techniques.

UNIT - I

Baking: Introduction, raw materials: essential and optional ingredients.

Types of wheat flour, characteristics of good quality, function of flour, dough and batters.

Sugar- Types and functions in bakery products.

UNIT - II

Fats, Eggs and Moisturizing agents -Role in baking

Milk and Milk products- Role and nutritional contribution in baking

Flavorings and spices- Role in baking

Leavening agents- Definition, physical, chemical and biological leavening agents, role of these in baking; Yeast- Types and functions.

UNIT – III

Bread- Ingredients, procedures for bread making, types of bread, common defects in bread making and bread improvers

Cakes- Ingredients, types of cakes, preparation of cakes and causes of variation in cake quality

UNIT – IV

Biscuits- Ingredients, essentials to get good biscuits, preparation of biscuits and nutritive value.

Pastries- Ingredients, types, nutritive value, essentials in making a good pastry and preparation of pastry.

Cookies- Ingredients, types, preparation of cookies and nutritive value.

UNIT - V

Icings and Fillings- Ingredients and types.

Sandwiches- Ingredients, types, preparation of sandwiches and nutritive value.

Baking ovens- Side-flue and similar ovens, steam-pipe ovens, hot air ovens, advantages and disadvantages.

REFERENCES

1. **Vijaya khader,** Text book of Food science and Technology, Indian council of Agricultural Research, New Delhi, 2001.
2. **Kumud khanna etal,** The art and science of cooking, A students manual, 3rd edition. Published by pr. Ouseph for phoenix, publishing House Pvt Ltd, 1998.
3. **Earl R. palan, Judith A. Studler,** preparing for the service industry, An introductory approach, AVI publishing co., Inc 1986.
4. **Swaminathan . M,** Food science, chemistry and experimental foods, The Bangalore printing and the publishing co Ltd, 2000.
5. **William C** practical in baking, 2000.
6. **Lillian Hoagland Meyer,** Food chemistry CBS publishers and Distributors, 2004.

MODEL QUESTION PAPER

BAKERY

Time: 3 hrs **Maximum: 75 marks**

Answer all questions

(5x15=75)

1. (a) List the essential ingredients in bakery and brief their role. (or)

(b) List the type of wheat flours and bring out the characteristics of good quality flour.

2. (a) Elucidate the role of liquids in baking. (or)

(b) What are leavening agents? Explain biological leavening agent.

3. (a) Explain types of bread and common defects encountered in bread making. (or) (b) Explain the process of preparation of pastry

4. (a) What are ingredients used in biscuits? Explain their role. (or)

(b) Explain the preparation of any 2 types of cakes.

5. (a) What is the meaning for 'icing'? Explain its types. (or)

(b) Explain the types of ovens used in bakery.

SEMESTER – V

ELECTIVE PAPER I

FOOD PRODUCT DEVELOPMENT AND QUALITY CONTROL

Theory: 5 Hours

OBJECTIVES

To enable students

- To study about quality control and common food standards.
- To understand the process of development of new food products

UNIT I

New food product- Definition, classification, factors shaping new product development: social concern, health concern, impact of market place influence and technology.

UNIT II

Product development- Steps, standardization methods. Portion size and portion control; Calculation of nutritive value and cost of production. Shelf life and storage stability evaluation procedure.

UNIT III

Product evaluation- Development of score card and analysis of data. Selection and training of judges.

Packaging- Suitability, development of packages and Labeling.

UNIT IV

Quality control – Objectives, importance, functions of quality control, stages of quality control in food industry.

Food quality assurance – Design of company quality assurance program and microbiological concerns.

Managing quality in supply chain and marketing of food products.

UNIT V

Government regulations in quality control – FAO/WHO codex Alimentarious commission, PFA, AGMARK, BIS, FPO, fair average quality (FAQ) specification for food grains, ISO 9000 series.

HACCP – Background, principles, benefits and limitation.

Consumer Protection Act (CPA)

Food adulteration – **C**ommon adulterants and tests to detect common adulterants.

REFERENCES

1. **A.Y.Sathe,** A first course in food analysis –New Age Publications, 1999.
2. **Norman. N. Potter & Joseph. H. Hotchkiss,** Food Science –CBS Publishers, 1996.
3. **M. Swaminathan,** Food science, Chemistry & Experimental Foods – Bappco Publishers.
4. BIS standards.
5. **Desrosier And Desrosier,** Technology of food preservation –CBS Publishers, Fourth edition, 1999.

MODEL QUESTION PAPER

FOOD PRODUCT DEVELOPMENT AND QUALITY CONTROL

Time: 3 Hours **Maximum: 75 marks**

PART - A (10 x 2 = 20 marks)

Answer all Questions

1. Write any two objective of quality control.
2. What is meant by quality assurance?
3. Expand the PFA.
4. What is the use of consumer protection act?
5. Give the standards for tea.
6. Give the standards for squash.
7. What is meant by food safety?
8. Give any two examples of chemical hazards.
9. Define adulteration.

10.What are the common adulterants added in cereals?

PART – B (5 x 5 = 25 marks)

Answer All Questions

11.a) Write the functions of quality control.

(or)

b) Give the importance of food quality assurance

12. a) Write a short notes on FPO.

(or)

b) Discuss the role of HACCP.

13. a) What are factors to be considered while selecting good tea?

(or)

b) How will you assess the quality of oils?

14. a) Write a note on food safety

(or)

b) What are the advantages of patent?

15. a) Brief out any two tests to detect the food adulterants

(or)

b) Write a short note on toxic chemicals.

PART – C (3 x 10 = 30 marks)

Answer any three questions out of five

16. Discuss on managing quality in marketing of food products.

17. Discuss the role of AGMARK and BIS.

18. Describe the standards for fruit products.

19. Explain in detail on Food Hazards.

20. Give the common food adulterants in different foods and a test to identify them.

SEMESTER – VI

CORE PAPER VIII **DIET THERAPY AND COUNSELING**

Theory: 6 Hours

OBJECTIVES

To enable the student to

- Understand the role of dietitian in preventive, promotive and curative health care.
- Make appropriate dietary modifications for various disease conditions and counsel the patient based on the patho physiology.

UNIT – I

Nutritional care for metabolic disorders- Diabetes mellitus: Types, etiology, symptoms, metabolic changes and dietary management.

Gout, phenyl ketonuria, lactose intolerance, hypo and hyper thyroidism- Causes, symptoms and dietary management.

UNIT – II

Nutritional care for diseases of Cardiovascular systems- Hypertension, hyperlipidaemia, atherosclerosis, coronary heart disease, congestive heart failure: Etiology, symptoms and dietary management. Relationship between dietary fat and development of cardiovascular diseases.

UNIT – III

Nutritional care for diseases of Kidney and urinary tract- Nephritis, nephrotic syndrome, nephrolithiasis, renal failure: Etiology, symptoms, dietary management and renal dialysis.

Nutritional care for Cancer and AIDS.

UNIT – IV

Food Allergy – Diagnosis and treatment.

Surgery, trauma and burns- Physiological changes, nutritional care and management.

Use of food exchange list in diet planning.

UNIT – V

Patient education and counseling- Assessment of patient needs, establishing rapport, counseling relationship, resources and aids to counseling.

REFERENCES

1. **Antia, F.P.,** Clinical Dietetics and Nutrition, Oxford University Press, Delhi, 2001.
2. **Mahan, L.K.,** Arlin, M.T., Krause's Food, Nutrition and Diet Therapy, W.B. Saunders Company, London, 8th edition, 1992.
3. **Williams, S.R.** Nutrition and Diet therapy, Times Mirror/Mosby College Publishing, St. Louis, seventh edition, 2000.
4. **Raheena, Begum,** A textbook of Foods, Nutrition and Dietetics, Sterling Publishers, New Delhi, 1989.
5. **Joshi, S.A.** Nutrition and Dietetics, Tata McGraw Hill Publications, New Delhi, 1992.
6. **Srilakshmi.B.,** Dietetics, New Age Private Limited Publisher, 2002.
7. **Dave,Indu,** The basic essentials of counseling, Sterling publishers pvt. Ltd. New Delhi, 1984.

8. **Barki,B.C., Mukhopadhyay, B.,** Guidance and counseling, A manual, Sterling Publishers pvt. Ltd. New Delhi, 1989.

MODEL QUESTION PAPER

DIET THERAPY AND COUNSELING

Time : 3 Hours **Maximum :75 marks**

PART – A (10 x 2 = 20 marks)

Answer All Questions

1. What are the symptoms of Jaundice?
2. What is fatty liver?
3. Mention the food to be avoided white planning hypertension?
4. What are the symptoms of Atherosclerosis?
5. What are the causes of nephrotic syndrome
6. List out the foods to be avoided for the patients suffering from nephritis.
7. Define food allergy.
8. Expand AIDS
9. What should a person with burns included in his diet?
10. What is meant by post operative care?

PART – B (5 x 5 = 25 marks)

Answer All Questions

11 a). Give the dietary management of cholelithiasis.

(or)

b). Mention the causes of viral hepatitis.

12 a). What should be the dietary adjustment in heart failure?

(or)

b). Suggest dietary modification for a person suffering from hyperlipidemia.

13 a). What is the sequence of events which lead to nephritic syndrome?

(or)

b). Write on the diets to be avoided and included in nephrolithiasis

14 a). Give an account of nutrition support in cancer.

(or)

b). Explain the diagnosis of allergy?

15 a). Explain the physiological changes of surgery.

(or)

b). Explain the physiological changes of burns.

PART – C (3 x 10 = 30 marks)

Answer Any Three Questions out of Five

16. Give the definition, etiology and dietary management of cirrhosis

17. What is atherosclerosis? Explain the dietary modification for this disease.

18. Give the dietary management of dialysis

19. List the major considerations in dietary management of AIDS. Give a sample diet for the condition.

20. Describe the nutritional management for burns.

SEMESTER – VI

ELECTIVE PAPER II **COMMUNITY NUTRITION**

Theory: 5 Hours

OBJECTIVES

To enable the students to

- Understand the nutritional problems prevailing in our country and their causes.
- Develop knowledge on implementation of various Government policies and programs to prevent various deficiency disorders.

UNIT – I

Community nutrition- Definition, ecology of malnutrition: Dietary factors, economic factors, socio cultural factors and environmental factors; vicisious and virtuous cycle of malnutrition; Definition: IMR, NMR and MMR.

UNIT – II

Assessment of nutritional status- Assessment of nutritional status in a community – direct and indirect methods, their merits and demerits.

UNIT – III

Nutrition education- Meaning, objectives, types and methods; Principles of planning, execution and evaluation of nutrition education program; Merits and limitations.

UNIT –IV

Role of National and International organizations to improve the nutritional status of people – ICAR, ICMR, NIN, CFTRI, FAO, WHO, UNICEF and NNMB.

UNIT – V

Nutrition intervention programs- Schemes and programs for various nutritional problems in India: Prophylaxis programs, Mid day meal program, SNP and ICDS- Objectives and services.

PRACTICALS:

One week nutrition survey at a nearer rural/suburban/urban/slum areas.

REFERENCES

1. **Agarwal A.N,** Indian Economy, Problems of development and planning, Publications, 1981.
2. **Park J.E. and park K.** Text book of preventive and social medicine, Publications, 1994.
3. **B. Srilakshmi,** Nutrition Science New Age International (CP) Ltd, New Delhi, 2002.
4. **Mahtab, S. Bamji, N. Pralhad rao, Vinodini Reddy,** Text book of Human Nutrition, Oxford and IBIT Publishing co Pvt. Ltd, New Delhi, reprint 1999.
5. **Shukla,P.K.,** Nutritional problems of India,1982.

MODEL QUESTION PAPER

COMMUNITY NUTRITION

Time: 3 Hours **Maximum: 75 marks**

PART – A (10 x 2 = 20)

Answer all questions

1. Define community Nutrition.
2. Define malnutrition.
3. How will you assess the nutritional status of pre school children?

4. What are the advantages of diet survey?
5. What is skeletal fluorosis?
6. Bring out the importance of Iodine.
7. What does CARE Provide?
8. Write the objectives of ICMR.
9. Write the objectives of prophylaxis program.
10. Write the objectives of ICDS.

PART – B (5 x 5 = 25)

Answer all questions

11. a) Write the concept of community nutrition?

(or)

b) Write the causes of malnutrition.

12. a) Bring out the importance of assessment of nutritional status.

(or)

b) What are the advantages of clinical assessment?

13. a) Give a brief account of fluorosis

(or)

b) What dietary modification you would suggest to control anemia?

14. a) Give a brief account of FAO

(or)

b) Analyze the success of the UNICEF in Tamilnadu.

15. a) Write an account of Vitamin A Prophylaxis program.

(or)

b) Write a note on Mid day meal program for school children.

PART – C (3 x 10 = 30)

Answer any three questions out of five.

16. Comment on the concept that "the community has a direct responsibility for the health of individual".
17. Describe the anthropometric indices used in nutritional survey and their importance.
18. With reference to preschool age children explain the prevalence of protein energy malnutrition and explain the preventive processes available.
19. Discuss the role of international agencies in promoting nutrition education.
20. Elaborate on the contribution of the ICDS program for the improvement of the nutritional status.

SEMESTER – VI

SBEC IV **NUTRITION FOR HEALTH AND FITNESS**

Theory: 2 Hours

OBJECTIVES

To enable the students to

- Learn about the terms related to health and fitness
- Comprehend the interaction between fitness and nutrition

UNIT – I

Health- Concept of Health, changing concepts, definitions of health, dimensions of health, concept of well being, spectrum of health, determinants of health, ecology of health, right to health, responsibility for health and indicators of health.

UNIT – II

Exercise and Health related fitness- Health related fitness, health promotion and physical activity for health benefits,

Sports related fitness- Role of nutrition in sports and nutrition to athletic performance.

UNIT – III

Body weight and composition for Health and Sports- Ideal body weight, values and limitations of the BMI, composition of the body; Diet during training, prior to competition, during and after competition; dietary supplements for athletes.

UNIT – IV

Exercise performance- Energy expenditure during physical activity, carbohydrate metabolism and performance, fat metabolism and performance, effect of exercise on protein requirements, physique and sports performance.

UNIT – V

Exercise programs- Resistance exercise training, aerobic exercise, types of exercise, effective weight control - dieting or exercise; weight reduction program for young athletes.

REFERENCES

1. **K. Park** Test book of preventive and social medicine, 15th edition, MIS Banarsidas Bhano Publishers, Jabalpur, 1997.

2. **Melvin H. Williams,** Nutrition for Health, fitness and Sports, 7th edition, MC Graw Hill international Edition, 2005.
3. **Michael J.GIbney, lan A Macdonald and Helen M.Roche,** Nutrition and Metabolism, Blackwell Publishing company, Bangalore, Reprint 2004.

4MODEL QUESTION PAPER

SBEC IV NUTRITION FOR HEALTH AND FITNESS

Time : 3 Hours **Maximum :75 marks**

Answer All Questions

(5X15=75 marks)

1. (a) Explain the concept of health and dimensions of health. (or)

   (b) What are the indicators of health?

2. (a) Explain the role of physical activity in health. (or)

   (b) Bring out the role of nutrition in improving sports performance.

3. (a) Explain BMI and body composition. (or)

   (b) Explain the type of diet recommended during training and prior to competition.

4. (a) Elaborate on the energy expenditure and carbohydrate metabolism during physical activity (or)

   (b) Elaborate on the effect of exercise on protein requirement and sports performance.

5. (a) Enumerate the types of exercise. (or)

(b) Explain the weight reduction programs for young athletes.

SEMESTER – VI

SBEC V **FOOD SANITATION AND HYGIENE**

Theory: 2 Hours

OBJECTIVES

To enable the students to

- understand the sanitary methods to be followed
- gain knowledge about the creation of hygienic environment

UNIT- I

Sanitation- Definition and meaning. Microbial growth pattern and factors affecting microbial proliferation. Assessment of microbial load- Total plate count technique, press plate technique, indicator or dye reduction test.

UNIT- II

Contamination- Sources of contamination and protection against contamination.

Methods of killing micro organism- Use of heat, chemicals and radiation.

Methods of inhibiting microbial growth- Use of refrigeration, chemicals, dehydration and fermentation.

UNIT-III

Cleaning compounds- Characteristics of good cleaning compound, classification and selection of cleaning compound.

Sanitizers- Thermal sanitizing and chemical sanitizing.

Food service sanitation- Cleaning steps, cleaning of equipments, mechanized cleaning and sanitizing.

UNIT-IV

Waste disposal- Disposal of solid waste; Waste water handling: Pretreatment, primary treatment, secondary treatment, tertiary treatment and disinfection.

UNIT- V

Personnel hygiene- Meaning and importance; Hygienic practices of employees; personal hygiene and contamination of food products; methods of disease transmission

REFERENCES

1. **Marriott, G. Norman,** Principles of food sanitation, Van Nostrand Reinhold company, New York, 1985.
2. **Sethi, M. and Matha, S.**, Catering management- An integrated approach, Wiley Eastern Ltd., New Delhi, 1993.

MODEL QUESTION PAPER

FOOD SANITATION AND HYGIENE

Time: 3 Hours **Maximum: 75 Marks**

Answer all questions

(5x15=75 Marks)

1. (a) Explain microbial growth pattern and factors affecting microbial proliferation. (or)

   (b) Write the methods of assessment of microbial load.

2. (a) List the sources of food contamination. (or)

   (b) Bring out the methods of killing micro organisms.

3. (a) Elucidate the characteristics of good cleaning compound. (or)

   (b) Explain the process of cleaning the equipments in food service units.

4. (a) Explain the effective method of solid waste disposal. (or)

   (b) Explain the effective method of waste water handling.

5. (a) Explain the meaning and importance of personal hygiene.(or)

   (b) Bring out the hygienic practices to be followed by employees in food industries.

SEMESTER – VI

SBEC EP 1

FOOD PRESERVATION, FOOD ADULTERATION AND BAKERY

Practical : 3 Hours

- Preparation of Jam, Jelly and Marmalade.
- Preparation of Fruit Juices and Squash.
- Preparation of Pickles.
- Preparation of Fruit Preserves – Tuity Fruity (Papaya), Petha (White Pumpkin) and Ginger Murabha (Ginger)
- Preparation of Vathal and Vadagam.
- Tests for identification of adulterants present in commonly used foods.
- Preparation of bread, cakes, cookies and pastry.
- Preparation of sandwiches and desserts.

SEMESTER - VI

ELECTIVE PAPER- III

INSTITUTIONAL PROJECT

Hours: 5

It is compulsory for all the students to complete any 2 of the given 3 institutional training programs in a reputed institution for a period of 15 days each. At the end of the final year, each student has to submit a report of the training and undergo a viva voce examination. Marking system is as follows:

Internal marks for report writing = 40

External marks = 60

Total marks = 100

External marks consist of the following components

20 marks- Performance appraisal report given by training institution

20 marks- Report

20 marks- Viva voce

Internal marks will be awarded by the faculty of the department with whose guidance the report is prepared.

Aspects to be covered in the institutional training programs

(A) Dietary internship training:

1. Assessing the nutritional status and diet history of patients.
2. Planning diet sheets, preparing and providing guidance in the production of therapeutic diet.
3. Supervising the preparation of diets.
4. Supervising the delivery of trays to the patient.
5. Getting feed back from patients regarding diets.
6. Understanding the lay out of hospital dietary unit.
7. Acquiring practical knowledge in diet counseling.
8. Under taking 2 case studies at hospital situation.

(B) Food service management training:

1. Reporting the purchasing and storage methods for ingredients.
2. Studying the lay out of work areas.
3. Acquiring knowledge on standardization methods.
4. Observing the equipments used and their maintenance.
5. Practicing the style of service and table setting.
6. Understanding the use of computers in various areas.
7. Studying the method of selection, induction and training given to employees.
8. Developing and standardizing a new recipe and finding selling price.

(C) Food processing training:

1. Studying the type of processing techniques used by the industry.
2. Gaining knowledge on equipments used in processing.
3. Understanding the packaging process.
4. Obtaining experience in quality control operations.
5. Studying the waste disposal methods.
6. Market survey for the demand for the product in the market.

COURSE OFFERED BY THE DEPARTMENT OF NUTRITION

AND DIETETICS

Allied paper I

FOOD SCIENCE I

Theory: 4 hrs

OBJECTIVES

To enable the students to

- Understand the principles of food science
- Learn the composition of various food

UNIT – I

Introduction to Food Science:

Functions of food, food groups, food exchange system, food in relation to health

UNIT – II

Properties of Foods:

Physical properties: Solution, vapour pressure, boiling point, freezing point osmotic pressure, viscosity, surface and interfacial tensions, specific gravity.

Acids, Bases and Buffers:

Acids and bases in foods, concept of acids and bases, buffers.

UNIT – III

Chemical Bond: Octet rule, ionic bond, covalent bond, polar and non polar molecules, hydrogen bond.

Food Colloids:

Sol : Properties, Functions

Gel : Properties, Structure.

Emulsion : Classification, properties, formulation of emulsion, stability of emulsion, stability of emulsions.

Foam : Characteristics, formation of foam, foam stability, factors affecting foam formation.

UNIT- IV

Fats and Other lipids:-

Occurrence in foods and composition, physical and chemical properties of facts and oils, reactions of facts, phospholipids, lipids in foods Fatty acid – Classification, Functions.

UNIT – V

Carbohydrates:

Monosaccharide:- structure, properties, derivatives, functions of sugars in foods.

Starch:- Structure, alpha amylase, beta amylase, modified starch. Cellulose and Pectic Substances, Changes of Carbohydrates on cooking, Food sources.

REFERENCES

1. **N. Shakuntala Manay, M. Shadaksraswamy,** Foods Facts and principles, 2nd edition, New Age international (p)Ltd, 2001.

2. **B. Srilakshmi,** Food Science 3rd Edition, New Age international (p)Ltd, Reprint 2006.
3. **M. Swaminathan,** Food Science, Chemistry and Experimental foods, The Bangalore printing and Publishing co Ltd, Reprint 2001.
4. **L. Llian Hoagland Meger,** Food Chemistry CBS Publishers and Distributes, reprint 2004.
5. **Norman. N. Potter, Joseph. H. Hotchkiss,** Food Science, CBS Publishers 1996.

ALLIED PAPER II

FOOD SCIENCE II

Theory 4 Hours

OBJECTIVES

To enable the students to

- Understand the role of food science
- Develop competence to carryout investigations in food science

UNIT- I

Proteins in foods: Chemical and Physical properties, protein structure, theories of gel formation, gelatin, food protein, nontraditional proteins, Nutritional importance, food sources.

UNIT- II

Water: Water content in foods, role in food preparation.

Composition and nutritive values:- Rice, Wheat, Rice bran, wheat germ, wheat bread, Ragi, Maize, Barley, Varugu.

Pulses and Nuts and Oil Seeds: Nutritive value, germination and toxicity, Nutritive values of fleshy foods and milk and milk products.

UNIT- III

Spices and condiments:- General functions

Medicinal values – Ajwain, aniseed, asafoetida, chillies, cardamom, clove, coriander seed, cumin seed, fegugneek, garlic, ginger, mint, onion mustard, tumeric and pepper.

Fortification of foods:- cereals and cereal products, dairy products, hydrogenated fats, special dietary foods.

UNIT- IV

Enzymes in Food processing:- Baking industries carbohydrates, diary industry, fruit products, wine industry.

UNIT- V

Food technology and future foods:- Biotechnology in food, biofortification, nutraceuticals, organic foods, low cost nutrient supplement, space food, packaging of food, nutrition labeling.

- Pigments in foods – Chlorophyll, carotenoids, Flavanoids, myoglobin
- Effects of cooking on various nutrients –carbohydrates, fats, proteins, vitamins & minerals
- Food Adulteration & hygiene – Definition, common adultrants in different foods contamination and harmful microorganisms.

REFERENCES

1. **N. Shakuntala Manay, M. Shadaksraswamy,** Foods Facts and principles, 2nd edition, New Age international (p)Ltd, 2001.
2. **B. Srilakshmi,** Food Science 3rd Edition, New Age international (p)Ltd, Reprint 2006.
3. **M. Swaminathan,** Food Science, Chemistry and Experimental foods, The Bangalore printing and Publishing co Ltd, Reprint 2001.
4. **L. Llian Hoagland Meger,** Food Chemistry CBS Publishers and Distributes, reprint 2004.

5. **Norman. N. Potter, Joseph. H. Hotchkiss,** Food Science, CBS Publishers 1996.

ALLIED PRACTICAL I

FOOD ANALYSIS PRACTICAL

Practical -3 Hours

1. Determination of fiber, moisture and ash content.
2. Estimation of Iron, phosphorus, calcium and vitamin c.
3. Tests for adulterants.
4. Demonstration experiments.
    i) Iodine value, saponification value and acid number of oil.
    ii) Estimation of total nitrogen in foods.

COURSE OFFERED BY THE DEPARTMENT OF NUTRITION AND DITETICS

ALLIED PAPER – I

HUMAN NUTRITION – I

Theory : 4 Hours

OBJECTIVES

To enable the student to

- Understand the role of macronutrients.
- The basic metabolism of macronutrients.

UNIT - I

Introduction to Human Nutrition: Orientation to human nutrition, an integrated approach, a conceptional framework for the study of nutrition,

relationship between nutrition and health, nutrient: the basics, global malnutrition.

RDA- meaning, RDA of nutrients for different age groups.

UNIT – II

Energy Metabolism: Introduction: Introduction, measurement of food energy, energy intake and expenditure, measurement of energy expenditure, energy requirements, maintenance of body weight, excess energy intake, food sources of energy.

UNIT – III

Proteins and Aminoacids: Introduction composition, classification, functions, food sources of protein, digestion, absorption, essential aminoacid, protein deficiency.

UNIT -IV

Carbohydrates: Introduction, composition, classification, functions, food sources, digestion, absorption, utilisation, regulation of blood sugar, Dietary fiber: Classification, sources, role in health and diseases.

UNIT -V

Fats and other Lipids: Introduction, composition, sources, classification, functions, digestion, absorption, essential fatty acids, Diet and heart ailments: effect of diet on plasma lipids, plasma cholesterol, plasma triglycerides.

REFERENCES

1. Sumati R. Mudambi, M.V. Raja gopal – Fundamentals of Foods and Nutrition 4th edition, New Age International (P) Limited, Publishers, 2001.
2. Mangala Kargo – Normal nutrition Fundamentals and management, RBSA Publishers, 2003.
3. Michael J. Gibney, Hester H. Vorster and Frans J. Kok – Introduction to Human nutrition, Blackwell publishing 2003.
4. B. Srilakshmi Nutrition Science, New Age International (P) Limited, Publishers, 2002.

ALLIED PAPER – II

HUMAN NUTRITION – II

Theory : 4 Hours

OBJECTIVES

To enable the student to

- Understand the role of micronutrients.
- Develop competence to carry out investigations in nutrition.

UNIT –I

Fat Soluble Vitamins: Vitamin A, D, E, K – Functions, food sources, recommended daily allowances, effect of deficiency.

UNIT – II

Water Soluble Vitamins: Vitamin B Complex – Thiamine, Riboflavin, Niacin, Pyridoxine, Folic acid, Vitamin B_{12} and Vitamin C: Functions, food sources, recommended daily allowances, effect of deficiency.

UNIT –III

Minerals: Introduction, nature and composition, general functions of minerals, Absorption of minerals. Calcium, Phosphorus, Iron, Iodine, Zinc, Flouride: Functions, food sources, requirements, effect of deficiency.

UNIT –IV

Water and Electrolytes:

Water - Body composition, functions, water balance, food sources, requirement, problems of dehydration and oedema.

Electrolytes: Sodium, Potassium – Functions, food sources, requirements utilisation, effects of deficiency and excess.

UNIT –V

Food guides for selecting an adequate diet: Introduction development of a food guides basic five groups, Food exchange lists, use of the food guide in meal planning and evaluation. Fortification, enrichments, functional foods, phytochemicals.

REFERENCES

1. Sumati R. Mudambi, M.V. Raja gopal – Fundamentals of Foods and Nutrition 4th edition, New Age International (P) Limited, Publishers, 2001.
2. Mangala Kargo – Normal nutrition Fundamentals and management, RBSA Publishers, 2003.
3. Michael J. Gibney, Hester H. Vorster and Frans J. Kok – Introduction to Human nutrition, Blackwell publishing 2003.
4. B. Srilakshmi Nutrition Science, New Age International (P) Limited, Publishers, 2002.

ALLIED PRACTICAL I

CLINICAL NTRITION PRACTICAL

Practical : 3hours

1. Determination of urinary phosphorus, calcium, urea, ascorbic acid and creatinine.
2. Estimation of cholesterol, Iron, hemoglobin, glucose and phospholipids.

NUTRITION AND DIETETICS

NON MAJOR ELECTIVE COURSES (NMEC)

SEMESTER III

NMEC I BASIC FOOD SCIENCE

THEORY: 2 hours

OBJECTIVES

To enable the students to

- Learn the composition of various foods.
- Study the effects of cooking on nutritive value.

UNIT - I

Introduction to Food Science- Functions of food; food guide based on basic five food groups, cooking – objectives and methods.

UNIT – II

Cereals- Composition and nutritive value of rice and wheat. Best method of cooking, loss of nutrients during cooking; Advantages of par boiling.

UNIT - III

Pulses - Composition, nutritive value, best method of cooking, loss of nutrients during cooking, germination and its advantages.

UNIT – IV

Vegetables – Classification, nutritive value, loss of nutrients during cooking and methods of reducing nutrient loss during cooking**.**

UNIT – V

Fruits- Classification, nutritive value and changes during ripening.

Fleshy foods- Meat, fish, egg and milk: Nutritive value.

REFERENCES

1. Sumathi R. Mudambi, Shalini M. Rao, M.V. Rajagopal Food Science, revised second edition, New Age International (p) Limited, Publishers New Delhi, reprint – 2006.
2. N. Swaminathan, Food Science and Experimental foods, The Bangalore printing and publishing Co. Ltd. Bangalore, 1992.
3. B. Srilakshmi, Food Science, New Age international (P) Ltd, New Delhi, Reprint 2006.
4. N. Shakuntala Manay, M. Shadaksharaswamy, Foods – Facts and Principles. 2nd Edition. New Age International (P) Ltd, New Delhi, Reprint 2005.

MODEL QUESTION PAPER

NMEC 1 BASIC FOOD SCIENCE

Time: 3 Hours **Maximum: 75 marks**

1. (a) Explain basic 5 food grouping.(or)

   (b) Explain any 3 methods of cooking.

2. (a) Write the nutritive value of rice and wheat. (or)

   (b) Elaborate the advantages of parboiling.

3. (a) Give the nutritive value of pulses and their loss during cooking.(or)

   (b) Explain the process of germination and its advantages.

4. (a) Write the classification and nutritive value of vegetables. (or)

   (b) Which nutrients are lost during cooking of vegetables? Give suggestions to reduce nutrient loss during cooking.

5. (a) What are the changes that occur in fruits during ripening? (or)

   (b) Write the nutritive value of milk and egg.

SEMESTER IV

NMEC2 BASIC NUTRITION

THEORY : 2 hours

OBJECTIVES

To enable the students to

- Understand the principles of nutrition

- Learn about the nutrients and deficiency

UNIT – I

Carbohydrate – Classification, functions, blood sugar regulation and sources. Importance and sources of fiber.

Energy: Definition, Units for measuring energy, Energy value of foods and RDA.

UNIT – II

Lipids – Composition, classification, functions and sources. Role of lipids in causing heart diseases.

UNIT – III

Protein - Composition, classification (nutritional and biological), functions, sources and RDA.

UNIT – IV

Minerals

Calcium, Phosphorus, Iron, Zinc and Iodine– Functions, sources, requirement and effect of deficiency.

UNIT – V

Vitamins

Vitamin A, D, E, K, B1, B2 & Vitamin C - Functions, sources, requirement and effect of deficiency.

REFERENCES

1. Mangala Kango Normal Nutrition (Fundamental & Management) RBSA Publishers S.M.S Highway Jaipur – 302003 L, 2003.

2. M. Raheena Begum, Text book of Foods, Nutrition and Dietetics, Second Revised Edition, Sterling Publishers Private Ltd, New Delhi, 2005.
3. B. Srilakshmi, Nutrition Science, New Age International (P) Ltd, New Delhi, 2002.
4. Mahtab S. Bamji, N. Pralhad Rao, Vinodini Reddy, Text Book of Human Nutrition Oxford and IBH Publishing Co. Pvt. Ltd, New Delhi, Reprint 1999.

MODEL QUESTION PAPER

NMEC-2 BASIC NUTRITION

Time: 3 Hours **Maximum: 75 marks**

Answer all the questions

(5x15=75)

1. (a) Explain the functions and sources of carbohydrates. (or)

   (b) Give RDA for energy for all the age groups.

2. (a) Explain the classification and functions of lipids. (or)

   (b) Bring out the role lipids in heart diseases.

3. (a) Enumerate the classification and functions of protein. (or)

   (b) Write the sources and requirements of protein.

4. (a) Explain the functions and effects of deficiency of calcium. (or)

   (b) Bring out the effects of deficiency of iron and iodine.

5. (a) What are the functions and requirement of vitamin-A. (or)

   (b) Explain the functions and effects of deficiency of vitamin- C.