MAHARSHI DAYANAND SARASWATI UNIVERSITY

Scheme of Examination of B. Sc. Food Science and Nutrition 2016-17

B. Sc. Part I

SEM	Paper No.	Nomenclature of Paper	Marks		Hrs. of Instruction/wk	
			Theory	**Practical**	**Theory**	**Practical**
I	**1**	Fundamental of Food and Nutrition	50	50	5	4
	2	Human Physiology	50	50	5	4
	3	Socio Economic Analysis of Communities	50	-	5	-
	4	Food Behaviour	50	-	5	-
	C 1	Environmental Studies	*	-	4	-
		Semester I Total	**200**	**100**	**24**	**8**
			300		**32**	
II	**5**	Food Commodity and Preparation	50	50	5	4
	6	Nutritional Management in Health and Disease	50	50	5	4
	7	Human Nutrition	50	-	5	-
	8	Community Resource Management and Extension	50	-	5	-
	C 2	English	*	-	4	-
		Semester II Total	**200**	**100**	**24**	**8**
			300		**32**	

NOTE:

* C1 and C2 are the compulsory papers

* Marks of the compulsory papers will not be included in the aggregate. A candidate is only required to pass in these compulsory papers. (Pass percentage being 36%)

MAHARSHI DAYANAND SARASWATI UNIVERSITY
Scheme of Examination of B. Sc. Food Science and Nutrition 2016-17
B. Sc. Part II

SEM	Paper No.	Nomenclature of Paper	Marks		Hrs. of Instruction/wk	
			Theory	**Practical**	**Theory**	**Practical**
III	9	Food Microbiology, Hygiene & Sanitation	50		5	
	10	Nutritional Biochemistry	50	50	5	5
	11	Nutrition through Life Cycle	50	50	5	5
	12	Problems in Human Nutrition	50		5	
			200	**100**	**20**	**10**
		Total of Semester III	**300**		**30**	
IV	13	Diet Therapy I	50	50	5	5
	14	Community Nutrition	50		5	
	15	Nutritional Assessment & Surveillance	50	50	5	5
	16	Food Science & Chemistry	50		5	
			200	**100**	**20**	**10**
		Total of Semester IV	**300**		**30**	

MAHARSHI DAYANAND SARASWATI UNIVERSITY
Scheme of Examination of B. Sc. Food Science and Nutrition 2017-18
B. Sc. Part III

SEM	Paper No.	Nomenclature of Paper	Marks		Hrs. of Instruction/wk	
			Theory	**Practical**	**Theory**	**Practical**
V	17	Diet Therapy II	50	50	5	5
	18	Institutional Food Service Management	50	50	5	5
	19	Public Health and Epidemiology	50		5	
	20	Food Processing & Technology	50		5	
			200	**100**	**20**	**10**
		Total of Semester V	**300**		**30**	
VI	21	Nutrition & Health Communication	50	50	5	5
	22	Food Quality Control	50	50	5	5
	23	Dietetic Techniques & Patient Counselling	50		5	
	24	Entrepreneurship Management	50		5	
			200	**100**	**20**	**10**
		Total of Semester VI	**300**		**30**	
GRAND TOTAL of B. Sc.			**1800**			

PROGRAMME OF STUDY:- The under graduate programme (B.sc Food Science & Nutrition) will be of 3 years duration with exams conducted according to the University semester scheme. The 3 years course will be divided into 6 semesters of 6 months duration each.

ELIGIBILITY:- 10+2 in all streams with minimum 50% marks for General and 45% marks for SC/ST/OBC/SBC

SCHEME: - The scheme of examination with nomenclature of papers (Theory and Practical) for every semester, with marks and hours of instruction, are clearly mentioned in the syllabus. The minimum passing marks in individual papers for any semester will be 40% and the aggregate pass marks for the semester will be 40%.

INTERNAL ASSESMENT: - For every theory and practical paper 20% of the maximum marks will be awarded on the basis of internal assessment. Internal assessment will be based on:-

a) Written tests (minimum two)- 10%
b) Assignment/class presentation/group discussion/regularity in the class room-10%.

EXAMINATION:-

a) Result: - The minimum passing marks in individual papers for any semester will be 40% and the aggregate pass marks for semester will be 40%.
b) Division: - First division is awarded to candidates securing 60% marks in the aggregate or above; Second division is awarded to candidates securing 48% to 59.9%. Candidates securing less than 48% marks will be awarded Third Division and below 40% marks in the aggregate will be declared as Failed.
c) Due Paper: - candidates securing less than 40% marks in two papers in a single semester can reappear in that paper when the next exam of the Semester Scheme is held.

SEMESTER I

Paper 1

FUNDAMENTALS OF FOOD AND NUTRITION

Hours/Week:5 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Note: Examiner is requested to set the question paper of 40 marks only. Each question paper is divided into three parts, Part- A, Part B and Part C.

Part A: (8 marks) is compulsory and contains 8 questions (20 words each) at least 1 questions from each unit. (Each question is of 1 mark)

Part B: (8 marks) is compulsory and contains 4 questions (50 words each) at least 1 questions from each unit. (Each question is of 2 marks)

Part C: (24 marks) is compulsory and contains 6 questions, 2 from each unit (400 words each) candidate is required to attempt 3 questions, one from each unit. (Each question is of 8marks)

Objectives:

This course will enable the students to-

1. Understand the functions of food and the role of various nutrients, the requirements and the effects of deficiency and excess (in brief).
2. Learn about the structure, composition, nutritional contribution and selection of different food stuff.
3. Be familiar with different method of cooking, their advantages and disadvantages.
4. Develop an ability to improve the nutritional quality of food.

Content:

UNIT I

1. **Concept of Nutrition**
2. **Function of Food.**
3. **Basic Terminology used in Food Preparation.**

4. **Nutrients Macro and Micro Nutrients.**
   - **a)** Classification, sources, functions, RDA, Deficiency and excess. (in brief)
     - i. Energy
     - ii. Carbohydrate
     - iii. Fat
     - iv. Protein
     - v. Water
     - vi. Fibre

b) Vitamins and minerals

I. Water soluble vitamins

II. Fat soluble vitamins- A, D, E, K.

c) Minerals – Iron, Calcium, Zinc, Florien, Magnesium, Iodine, Selenium, Copper, Manganese.

UNIT II

5. Food Production (in brief), Food Composition, Structure, Nutritional Contribution and Selection Factors for the following-

a) Cereals and Millets
b) Pulses
c) Fruits and Vegetables
d) Milk and Milk Products
e) Nuts and Oil Seeds.
f) Meat Fish and Poultry, Egg.
g) Sugars
h) Tea, Coffee, Cocoa, Chocolate and other beverages.
i) Condiments and Spices
j) Processed Foods

UNIT III

6. **Methods of Cooking**
   a) Advantages
   b) Disadvantages
   c) Effect on Nutritive value

7. **Improving Nutritional Quality of Foods**
   a) Germination
   b) Fermentation
   c) Supplementation
   d) Substitution
   e) Fortification and Enrichment

References:

1. Robinson , C.H., Lawler, M.R. Chenoweth W.L. and Garwick A.E. (1986): Novel and Therapeutic Nutrition, 17th Edition, Macmillan Publishing Co.
2. Swaminathan. M.S. (1985): Essentials of Food and Nutrition VI: Fundamentals Aspects, VII Applied Aspects.
3. Hughes, O, Bennion, M. (1970) : Introductory Foods, 5th Edition, Macmillan Company .
4. Williams, S.R. (1989): Nutritional Diet Therapy, 4th Edition, C.B. Mosby C

Paper 1

FUNDAMENTALS OF FOOD AND NUTRITION

PRACTICAL

Hours/Week:4 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Objectives:

This course will enable the students to-

1. To acquire skills in Food Preparation Techniques.
2. To appropriate method of cooking for preparation of specific food products.

Contents:

1. **Use and care of Kitchen Equipment**
2. **Controlling techniques**

a) Weight and Measures Standard and Household Measures for Raw and Cooked Foods.
b) Recipe and Evaluation of a Production.

3. **Food preparation and Classifying Recopies** as Good, Moderate or Poor sources of specific Nutrients. Amount of ingredients to be used in standard recipe in reference to portion size.
   - **a) Beverage**s – Tea, Coffee, Cocoa, Fruit juice, Milk , Milk shakes
   - **b) Cereal and flour mixtures – Basic preparations.**
     - I. Boiled rice and Rice Pulao
     - II. Chapati, Poori and Paratha
     - III. Sandwiches
     - IV. Pastas
     - V. Pancakes
     - VI. Biscuits
     - VII. Cookies
     - VIII. Cakes
4. **Vegetables**
   - a) Simple Salads
   - b) Dry Vegetables
   - **c)** Curries
5. **Fruits**
   - a) Fruit Salad
   - b) Fruit Preparations using Fresh and Dried Stewed Fruits.
6. **Milk**
   - a) Curds, Paneer and their commonly made preparations.
   - **b)** Milk based simple desserts and Puddings – Custards, Kheer, Ice-cream**.**
7. **Soups –** Basic Clear and Cream Soup.
8. **Snacks.**
9. **Peanut Chikki, Til Laddoo.**

Paper 2

HUMAN PHYSIOLOGY

Hours/Week:5 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Note: Examiner is requested to set the question paper of 40 marks only. Each question paper is divided into three parts, Part- A, Part B and Part C.

Part A: (8 marks) is compulsory and contains 8 questions (20 words each) at least 1 questions from each unit. (Each question is of 1 mark)

Part B: (8 marks) is compulsory and contains 4 questions (50 words each) at least 1 questions from each unit. (Each question is of 2 marks)

Part C: (24 marks) is compulsory and contains 6 questions, 2 from each unit (400 words each) candidate is required to attempt 3 questions, one from each unit. (Each question is of 8marks)

Objectives:

This course will enable the students to- understand the physiology of human body.

Contents:

UNIT I

1. **General principles of Physiology**
2. **Elementary anatomy of various systems.**
3. **Cardiovascular system**
    a) Blood and its composition
    b) Blood groups
    c) Coagulation of blood
    d) Structure and functions of heart
    e) Heart rate, Cardiac output, blood pressure and its regulation

4. **Musculoskeletal System**
    a) Type of muscles, functions
    b) Skeletal system- formation of bone and teeth.

UNIT II

5. **Reproductive system**
    a) Structure and functions of sex glands and organs including hormones.
    b) Menstrual cycle
    c) Physiology of pregnancy, Parturition, Lactation and Menopause.
6. **Excretory System**
    a) Structure and function of kidney, bladder, formation of urine, role of kidney in homeostasis.
    b) Structure and function of skin.

c) Regulation of temperature of body.

7. Respiratory system

a) Structure of lungs
b) Mechanism of respiration and its regulations
c) O_2 and CO_2 transport in blood
d) Vital capacity and other volumes
e) Muscular exercise

UNIT III

8. Gastrointestinal System

a) Structure and function of various organ of GI Tract
b) Digestion and absorption of food and the role of enzymes and hormones.

9. Nervous System

a) Elementary anatomy of nervous system.
b) Functions of different parts of brain in brief.
c) Automatic, Sympathetic and Parasympathetic nervous system.
d) Special senses.

10. Human Genetics

a) Human chromosomes, the inheritance and variation in man
b) Abnormalities of autosomal chromosomes and chromosomes structure.
c) The genetics basis of human disease- Sickle cell anaemia, Haemophilia, Colour Blindness and Diabetes
d) Genetic counselling.

References:

1) Guyton, A.C., Hall, J.E. (1996): Textbook of Medical Physiology, 9th Ed. Prism Books (Pvt.) Ltd., Bangalore.
2) Winwood (1998): Anatomy and Physiology for Nurses, London, Edward, Arnold.
3) Wilson(1989): Anatomy and Physiology in health and illness, Edinburgh, Churchill Living Stone.
4) Chatterjee, C.C., (1988): A Textbook of Medical Physiology, London W.B. Sounder's Co.

Paper 2

HUMAN PHYSIOLOGY
PRACTICAL

Hours/Week:4 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Contents:

1) First aid box layout.
2) Measurement of height and weight
3) Measurement of Blood Pressure

4) Total Blood Count (Demonstration only)
5) Urine analysis (Demonstration only)
6) Other Haematological Parameters: Bleeding Time, Clotting Time and Blood Group estimation (Demonstration only)

Paper 3
SOCIO-ECONOMIC ANALYSIS OF COMMUNITIES

Hours/Week:5 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Note: Examiner is requested to set the question paper of 40 marks only. Each question paper is divided into three parts, Part- A, Part B and Part C.

Part A: (8 marks) is compulsory and contains 8 questions (20 words each) at least 1 questions from each unit. (Each question is of 1 mark)

Part B: (8 marks) is compulsory and contains 4 questions (50 words each) at least 1 questions from each unit. (Each question is of 2 marks)

Part C: (24 marks) is compulsory and contains 6 questions, 2 from each unit (400 words each) candidate is required to attempt 3 questions, one from each unit. (Each question is of 8marks)

Objectives:

This course will enable the students to-

1) Understand the socio economic structures and systems that make up rural and urban communities.

2) Understand the meaning of Social Change through development plans and programmes in the context of the existing socio economic structures and systems.

3) Recognise one's own role in the development process.

Contents:

UNIT I

1. **Introduction To Social Structures And Systems- Framework For Analysis**
   a) Meaning and System of Organisation
   b) Relationship between Social Systems
   c) Types of Society- Harmonic, Disharmonic.

2. **Analysis of Family as a Social Unit**
   a) Types, average size(Micro/macro), marriage patterns, distinct social roles and nature of relationships between members of the family.
   b) Internal distinction in authority based on age and sex roles, gender differences with reference to activities and access to resources.

c) Emerging patterns of familial organisation influenced by broader economic and political forces-female headed households.

UNIT II

3. Analysis of Social Relations of Groups Social Stratification- Caste System (Micro/Macro)

Differential ranking of groups as superior and inferior caste groups; changes that have taken place/ expected; abolition of un-touchability , inter caste collaboration , fusion of sub castes , impact of reservations, social inequalities , extent of acceptance or opposition.

4. Gender Analysis

a) The concept of Gender as distinct from sex
b) The division of labour.
c) Access and control of resource
d) Changes in the means of gaining access to resources

UNIT III

5. Approaches And Methods of Socio Economic Analysis

a) Rapid Rural Appraisal
b) Participatory Rural Appraisal
c) Surveys , Case studies, Observation
d) Participant Observations.

References:

1. Desrochers, John (1984) ; Indias search for development and social justice, analysis of indian society. The development debate, Bangalore, India, centre for social action.
2. Singh,k.(1980) ; Principle of Sociology, lucknow, Prakashan Kendra
3. Thingalaya, N.K.(1986) : Rural India-Real India, Bombay, Himalya Publishing House.
4. Subramaniya, K.N.(1988) :Economic Development and Planning in India, New Delhi, Deep Deep Publication.
5. Agarwal, A.N.(1994): Indian Economy , Problems of Development and Planning, Madras, Wiley Eastern Ltd.

Journals:

1)Social Welfare , central social welfare board , Samaj Kalyan Bhawan,B-12 Tana Crescent, Institutional Area , South of IIT, New Delhi

2) Yojna, Director, Publication Divisions, Patiala House, New Delhi.

Paper 4

FOOD BEHAVIOUR

Hours/Week:5 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Note: Examiner is requested to set the question paper of 40 marks only. Each question paper is divided into three parts, Part- A, Part B and Part C.

Part A: (8 marks) is compulsory and contains 8 questions (20 words each) at least 1 questions from each unit. (Each question is of 1 mark)

Part B: (8 marks) is compulsory and contains 4 questions (50 words each) at least 1 questions from each unit. (Each question is of 2 marks)

Part C: (24 marks) is compulsory and contains 6 questions, 2 from each unit (400 words each) candidate is required to attempt 3 questions, one from each unit. (Each question is of 8marks)

Objectives:

This course will enable the students to-

1. Understand formation of food habits.
2. Know how various factors influence dietary practices of Individuals.
3. Understand Food fads and Fallacies and their impact on food habits.
4. Understand forces operating in modifying food behaviour.

Contents:

UNIT I

1. **Food Behaviour Concept:**
   a) Factor affecting food behaviour- Agriculture, Economic, Environmental, Socio-cultural, Psychological, Religious, Role of Industrialization, Urbanization, Work Patterns and Mass Media.
   b) Food behaviour and linkages with health.
2. **Food habits:**
   a) Knowledge, Attitudes, Practice.
   b) Food habits and dietary patterns in different region and communities in India.
   c) Factors affecting food habits- Family size, composition, structure, economic status, working status of mother, education.
3. **Relation of knowledge, attitudes, beliefs and practices in food behaviour.**

UNIT II

4. **Studying Food Behaviour**
   a) Identifying opportunities and points of resistance

b) Planning and conducting food behaviour studies-evaluating food behaviour.

5. **Food**
   Facts, Fallacies and belief- identifying positive, neutral, negative implications.

6. **Dietary Pattern**
   Factors affecting food intake, Food waste, Prejudices and aversions, KAP of individuals and families- regional variations and nutritional implications.

7. **Modifying Food Behaviour**
   Changing attitude, Changing Knowledge, Changing Behaviour.

UNIT III

8. **Modifying Food Behaviour in Different Age Groups**
   Intervention strategies and implementation- case studies.

9. **Role of different members of family and community in changing Food Behaviour**
   Parents, Siblings, Role Models

10. **Indigenous systems of Medicine**
    Home remedies

11. **Legislation, Health and nutrition education**
    Role of media in changing food behaviour.

References :

1. Sanjur, D. (1982): Social and Cultural Perspectives in nutrition, Prentice Hall, Inc.
2. Long, P.J., Shann, B. (1983): Nutrition and Inquiry into the Issues, Prentice Hall, Inc.
3. Blix, G. (1978): Food Cultism and Nutrition quackery, Almquist and Wiksells Uppsala.
4. Gillespie, S., Mc Neil, G. (1992) : Food and Health and Survival in Developing Countries, Oxford University Press.
5. Yadav R.J.; Singh P. and Pandey A. (2009): acceptability of Indigenous System of Medicine in State of Bihar; Indian J. Prev. Soc. Med. Vol 40, No. 3 and 4
6. Usage and acceptability of Indian system of Medicine and Homeopathy in India, 2002 for Ministry of health and Family Welfare, Government of India; Institute for Research in Medical Statistics, ICMR, New Delhi.
7. Macias;Y.F. and Glasauer, P; 2014. Guidelines for Assessing Nutrition related knowledge, attitude and Practices. Food and Agriculture Organisation of United States Rome.
8. Brown Millwerd 2010: Food behaviour: the International Evidence

COMPULSORY PAPER- I

ENVIRONMENTAL SCIENCE

Hours/Week:4 **Max. Marks: 50**
Duration of Examination: 3 hrs Internal Assessment :10

Note: Examiner is requested to set the question paper of 40 marks only. Each question paper is divided into three parts, Part- A, Part B and Part C.
Candidates are required to secure minimum passing mark in this paper. The marks obtained in this paper will not be included in the grand total of the paper.

Part A: (8 marks) is compulsory and contains 8 questions (20 words each) at least 1 questions from each unit. (Each question is of 1 mark)

Part B: (8 marks) is compulsory and contains 4 questions (50 words each) at least 1 questions from each unit. (Each question is of 2 marks)

Part C: (24 marks) is compulsory and contains 6 questions, 2 from each unit (400 words each) candidate is required to attempt 3 questions, one from each unit. (Each question is of 8marks)

Objectives:

1. To create awareness about important environmental issues.
2. To study Conservation of resources.

Contents:

UNIT I

1. Natural Resources:
Renewable and Non Renewable Resources
Natural Resources and associated problems

a) Forest Resources: Use and over exploitation, deforestation, Timber extraction mining, dam sand their effects on forests and tribal people.
b) Water Resources: Use and over-utilization of sources and ground water, floods, drought, conflicts over water, dams benefits and problems.
c) Mineral resources: Use and exploitation, environmental effects of extracting and using minerals resources
d) Food resources: World food problems, changes causes by agriculture and overgrazing, effects of modern agriculture, fertilizer- pesticide problems, water logging, salinity, case studies.
e) Energy resources: Growing energy needs, renewal and non-renewable energy sources, use of alternative energy sources. Case Studies.
f) Land Resources: lands as a resource, land degradation man induces landslides, soil erosion and desertification.

UNIT II

2. Biodiversity and its conservation

Introduction-definition: genetic, species and ecosystem diversity

a) Bio geographical classification of India
b) Value of Biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.
c) Biodiversity at Global, national and local levels.
d) India as a mega university nation.
e) Hot spots of biodiversity.
f) Threats to Biodiversity: Habitat loss, poaching of wild life, man- wild life conflicts.
g) Endangered and endemic Species of India.
h) Conservation of Biodiversity: in situ and ex situ conservation.
i) Environmental Pollution: definition, causes, effects, and control measures of
    i. Air Pollution
    ii. water Pollution
    iii. Soil Pollution
    iv. Marine Pollution
    v. Noise Pollution
    vi. Thermal Pollution
    vii. Nuclear Hazards.

UNIT III

3. Social Issues and Environment

a) From unsustainable to sustainable development
b) Urban problems related to energy
c) Water conservation, Rain water harvesting, and water shed management.
d) Resettlement and Rehabilitation of people: its problems and concerns.
e) Environmental Ethics- issues and possible solution
f) Climate change, global warming, acid rain, ozone layer deep waste land reclamation.
g) Consumerism and waste product.
h) Environmental protection act.
i) Prevention and control of pollution act.
j) Pre life protection act.
k) Past Conservation act.

Reference:

1. Bharucha Erach, Textbook of Environmental Studies, University Press, Hyderabad.
2. Uberoi, N.K., Environmental Management, Excel books, New Delhi.
3. Pandey,G.N ., Environmental Management, Vikas Publishing, New Delhi

SEMESTER II

Paper 5

FOOD COMMODITIES AND PREPARATION

Hours/Week:5 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Note: Examiner is requested to set the question paper of 40 marks only. Each question paper is divided into three parts, Part- A, Part B and Part C.

Part A: (8 marks) is compulsory and contains 8 questions (20 words each) at least 1 questions from each unit. (Each question is of 1 mark)

Part B: (8 marks) is compulsory and contains 4 questions (50 words each) at least 1 questions from each unit. (Each question is of 2 marks)

Part C: (24 marks) is compulsory and contains 6 questions, 2 from each unit (400 words each) candidate is required to attempt 3 questions, one from each unit. (Each question is of 8marks)

Objectives

This course will enable the student to -

1. Understand factors to be considered during selection of basic commodities, raw and processed, and various aspects of their production and distribution.
2. Know the qualities and standards of available commodities and their suitability for different purposes.
3. Understand use of different commodities in various food preparations.

Contents:

UNIT I

1. **Cereals and Millets,** cereal products, breakfast cereals, fast foods
   a) structure, processing, storage, use in various preparations, variety, selection and cost.

2. **Pulses and Legumes -** Production (in brief), structures, selection and variety.
   a) Storage, processing and use in different preparations.
   b) Nutritional aspects and cost.

3. **Milk and Milk Products -** Composition, classification, selection quality and cost: Processing, storage and uses in different preparations. Nutritional aspects. Shelf life and spoilage.

4. **Eggs -** production, grade, quality, selection, storage and spoilage.
   a) Cost, nutritional aspects and use in different preparations.

5. **Meat, Fish and Poultry -** Types, selection, purchase, storage, uses, cost. Spoilage of fish, poultry and meat, uses and preparations.

UNIT II

6. **Vegetables and Fruits -** Variety, selection, purchase, storage, availability. Cost, use and nutritional aspects of raw and processed products and use in different preparations.

7. **Sugar and Sugar Products** - Types of natural sweeteners, manufacture, selection, storage and use as preserves. Stages in sugar cookery.

8. **Fats and Oils** - Types and sources (animal and vegetable), processing, uses in different preparations, storage, cost and nutritional aspects.

9. **Raising and Leavening agents** - Types, constituents, uses in cookery and bakery, storage.
10. **Food Adjuncts** -Spices, Condiments, Herbs, Extracts, Concentrates, Essences, Food colours. Origin, classification, description, uses, specifications, procurement and storage.

UNIT III

11. **Convenience Foods -** Role, types, advantages, uses, cost and contribution to diet.

12. **Salt** – Types and uses.

13. **Beverages -** Tea, Coffee, Chocolate and Cocoa powder - Production (including cultivation), processing, cost and nutritional aspects. Other beverages - Aerated beverages, Juices.

14. **Preserved Products:** Jams, Jellies, Pickles, Squashes, Syrups.
    a) Types, Composition and Manufacture, selection, cost, storage, uses and nutritional aspects.

15. **Food Standards** -ISI, Agmark, FPO, MPO, PFA.

Paper 5

FOOD COMMODITIES AND PREPARATION

PRACTICAL

Hours/Week:4 **Max. Marks: 50**

Duration of Examination: 3 hrs Main Exam:40

Internal Assessment :10

Objectives

This course will enable the students to –

1. Develop skills in preparing various food items.
2. Understand the principles underlying changes in food characteristics during cooking.
3. Learn proper handling, preparation and service of foods.
4. Be familiar with evaluation of food products for their quality characteristics.
5. Understand and use various methods of preservation of food.

Content:

1. **Introduction to practical -** Weights and measures- their equivalents.
   a) Use and care of kitchen equipment. Table setting and service.

2. **Preparing, Serving and evaluating food items**

   a) Beverages - Fruit and milk based, punches, juices etc.

   b) Cereals - Variations in Parathas, Purees, Rice pulao, Biryani, Lemon rice, Tamarind Rice, Dosa, Idli, preparations using Noodles, Macaroni, Spaghetti.

   c) Pulses - Khatta Channa, Rajmah, Sambhar etc. Vadas, Dhokla, Khandvi, Kadis.

   d) Vegetables - Vegetable Koftas, Cutlets, Baked Vegetable dishes and Fancy preparations.

   e) Soups - Variations in soups.

   f) Stews - Vegetable and Mutton.

   g) Salads & Salad dressings - Vegetable salads, whole meal salads, Frozen salads.

   h) Milk, Paneer, Cheese and Khoa preparations - Indian sweets: Barfis, Gulab Jamun, Ghana murgi, Sandesh, Rasgulla.

   i) Meat, fish and poultry - roasted, baked, fried, curries, kababs and Tandoori preparations.

j) Desserts - Halwas, variations in ice cream, soufflé, baked and steamed desserts, other hot and cold desserts.

k) Cakes - Variations: Creamed, Sponge-pastries, Swiss rolls etc.

l) Biscuits/Cookies and their variations, short crust pastry, Choux pastry, flaky pastry and their preparations.

m) Sandwiches - Open and Toasted.

n) Snacks - Savoury: Mathri, Kachoris, Samosa. Sweets: Ladoos, Gujias, Malpuras.

3. **Food Preservation** - Preparations of pickles and jams.
Demonstration of various methods like drying, Murabbas, Sauces, Squashes, Freezing, Canning etc.

References

1. Lavies, S. (1988): Food Commodities, Heinemann Ltd. London.
2. Hughes, 0. and Bennion, M. (1970): Introductory Foods, MacMillan & Co. New York. Pyke, M. (1974): Catering Service and Technology, John Murrey Pube, London.
3. Dowell, P., Bailey, A. (1980): The Book of Ingredients, Dorling Kinderley Ltd., London.
4. Phillip, T.E. (1988): Modern Cookery for Teaching and the Trade, 4th Ed., Orient Longman, Bombay. Pruthi, J.S. (1979): Spices and Condiments, National Book Trust, New Delhi.
5. Prevention of Food Adulteration Act (1994): Govt. of India.

Paper 6

NUTRITIONAL MANAGEMENT IN HEALTH AND DISEASE

Hours/Week:5 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Note: Examiner is requested to set the question paper of 40 marks only. Each question paper is divided into three parts, Part- A, Part B and Part C.

Part A: (8 marks) is compulsory and contains 8 questions (20 words each) at least 1 questions from each unit. (Each question is of 1 mark)

Part B: (8 marks) is compulsory and contains 4 questions (50 words each) at least 1 questions from each unit. (Each question is of 2 marks)

Part C: (24 marks) is compulsory and contains 6 questions, 2 from each unit (400 words each) candidate is required to attempt 3 questions, one from each unit. (Each question is of 8marks)

Objectives

This course will enable the student to

1. Understand the concept of an adequate diet and the importance of meal planning
2. Know the factors affecting the nutrient needs during the life cycle and the RDA for various age groups
3. Gain knowledge about dietary management in common ailments.

Contents:

UNIT I

1. Definition of health and nutrition

Dimensions of health (physical, psychological, emotional, spiritual)

2. Energy Requirements - Factors affecting energy requirements

BMR, Activity, age, climate, diet - induced thermogenesis (SDA), physiological conditions

UNIT II

3. Concept of nutritionally adequate diet and meal planning

a. Importance of meal planning
b. Factors affecting meal planning.
   - Nutritional, Socio-cultural, Religious, Geographic, Economic, Availability of time and material resources
   - Religious, Geographic, Economic, Availability of time and material resources.

4. Nutrition through the Life Cycle

(at different activity and Socio-economic levels) requirements, nutritional problems, food selection.

a. Adulthood
b. Pregnancy
c. Lactation
d. Infancy
e. Preschool
f. Adolescence
g. Old age

UNIT III

5. Principles of diet therapy

Modification of normal diet for therapeutic purposes, Full diet, Soft diet, Fluid diet, Bland diet.

6. Nutritional management in common ailments.

Requirements and diet planning

a. Diarrhoea
b. Constipation
c. Fevers - Weight Management

Paper 6

NUTRITIONAL MANAGEMENT IN HEALTH AND DISEASE

PRACTICAL

Hours/Week:4 **Max. Marks: 50**

Duration of Examination: 3 hrs Main Exam:40

Internal Assessment :10

Objectives:

This course will enable the students to –

1. Plan and prepare nutritionally adequate diets in relation to age, activity levels, physiological state and socio-economic status.
2. Make the therapeutic modifications of normal diet for common disease conditions.

Content:

1. **Planning and preparation of diets for different age groups at different socio-economic and activity levels in relation to special nutrient requirements.**
   a. Adult
   b. Pregnancy
   c. Lactation
   d. Infancy
   e. Pre-school Child
   f. School Child
   g. Adolescence
   h. Old age

2. **Planning and preparation of therapeutic and modified diets.**
   a. Soft diet
   b. Fluid diet
   C. Bland diet
   d. High protein diet
   e. High fibre
   f. Low fibre diet
   g. Calorie - restricted

References

1. Krause, M.V. and Mahan, L.K. (1986): Food, Nutrition and Diet Therapy, Alan A. Liss, Saunders co., London.
2. Passmore, R. and Davidson, S. (1986): Human Nutrition and Dietetics, Livingstone Publishers.
3. Robinson, C.H., Laer, M.R., Chenoweth, W.L., Garwick, A.E. (1986): Normal and Therapeutic Nutrition, MacMillan Publishing'Company, New York.
4. Williams, S. R. (1989): Nutrition and Diet Therapy, 4th Ed., C.V. Mosby Co.

5. Shils, M.E., Olson, J.A., Shike, M.Eds. (1994): Modern Nutritiop in Health and Disease, 8th Edn., Lea and Febiger - A Waverly Company

Paper 7

HUMAN NUTRITION

Hours/Week:5 **Max. Marks: 50**

Duration of Examination: 3 hrs Main Exam:40

Internal Assessment :10

Note: Examiner is requested to set the question paper of 40 marks only. Each question paper is divided into three parts, Part- A, Part B and Part C.

Part A: (8 marks) is compulsory and contains 8 questions (20 words each) at least 1 questions from each unit. (Each question is of 1 mark)

Part B: (8 marks) is compulsory and contains 4 questions (50 words each) at least 1 questions from each unit. (Each question is of 2 marks)

Part C: (24 marks) is compulsory and contains 6 questions, 2 from each unit (400 words each) candidate is required to attempt 3 questions, one from each unit. (Each question is of 8marks)

Objectives

This course will enable the student to -

1. Understand the functions and sources of nutrients.
2. Apply the knowledge in maintenance of good health for the individual and the community.
3. Be familiar with factors affecting availability and requirements

Content

UNIT I

Concept and definition of terms Nutrition, Malnutrition and Health

1. Brief History of Nutritional Science. Scope of Nutrition.

2. Minimal Nutritional Requirements and RDA — Formulation of RDA and Dietary Guidelines - Reference Man and Reference woman.

3. Body Composition and changes through the life cycle.

UNIT II

4. **Energy in Human Nutrition** - Energy Balance, Assessment of Energy Requirements, Deficiency and Excess.

5. **Proteins -** Assessment of Protein quaky (BV, PER, NPU), Digestion and Absorption, factors affecting protein bio-availability including anti-nutritional factors, Requirements, Deficiency.

6. **Lipids -** Digestion and Absorption, Intestinal re-synthesis of triglycerides. Types of fatty acids, role and nutritional significance (SFA, MUFA, PUFA, w-3).

7. **Carbohydrates -** Digestion and Absorption, Blood glucose and effect of different carbohydrates on blood glucose, Glycaemic Index.

UNIT III

8. **Dietary Fibre** - Classification, composition, properties and nutritional significance.

9. **Minerals and Trace Elements -** Physiological role, bio-availability and requirements, sources, Deficiency and Excess (Calcium, Phosphorus, Magnesium, Iron, Fluoride, Zinc, Selenium, Iodine, Chromium).

10. **Vitamins -** Physiological role, bio availability and requirements, sources, deficiency and excess (Fat Soluble and Water soluble)
11. **Water -** Functions, requirements.

References

1. Guthrie, A.H. (1986): Introductory Nutrition, 6th Ed., The C.V. Mosby Company.

2. Robinson, C.H., Lawler, M.R., Chenoweth, W.L. and Garwick, A.E. (1986): Normal and Therapeutic Nutrition, 17th Ed. MacMillan Publishing Co.

3. Swaminathan, M. (1985): Essentials of Food and Nutrition, Vols. I and II. Ganesh and Co. Madras.

4. Gopalan, C. et al., (1991): Nutritive value of Indian Foods, Indian Council of Medical Research.

5. Indian Council of Medical Research (1989): Nutrient Requirements and Recommended Dietary Allowances for Indians, New Delhi.

6. FAO/VVHO/UNU: Technical Report Series, 724(1985) Energy and Protein Requirements, Geneva.

7. WHO Technical Reports Series for different Nutrients

Paper 8

COMMUNITY RESOURCE MANAGEMENT AND EXTENSION

Hours/Week:5 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Note: Examiner is requested to set the question paper of 40 marks only. Each question paper is divided into three parts, Part- A, Part B and Part C.

Part A: (8 marks) is compulsory and contains 8 questions (20 words each) at least 1 questions from each unit. (Each question is of 1 mark)

Part B: (8 marks) is compulsory and contains 4 questions (50 words each) at least 1 questions from each unit. (Each question is of 2 marks)

Part C: (24 marks) is compulsory and contains 6 questions, 2 from each unit (400 words each) candidate is required to attempt 3 questions, one from each unit. (Each question is of 8marks)

Objectives

To enable the students to -

1. Understand the socio-economic structures and *terns that make up the rural and urban communities;
2. Understand the meaning of social change through development plans and programs in the context of the existing .socio-economic structures and systems;
3. Recognise one's own role in the development process.

Content

UNIT I

1. Analysis of Social Relations of Economic Life (Micro/Macro)

a. Resources available (land, water, climatic conditions, seeds etc.), type of technology in use (bullocks, ploughs - tractors, pump sets, means of transport), division of labour among the groups (unemployment, under employment).
b. Ownership pattern - land, livestock, ploughs, tractors, pump sets, transport etc., according to classes and gender.
c. Access to facilities of credit, irrigation, fertilizers, seeds, storage in relation to class groups and gender.
d. Land cultivation pattern - family labour / herd labour / tenancy or share cropping and consequent relation of different class groups to land; rent or wages paid-profit and loss in relation to the owner, tenant, labourer and gender.
e. Income distribution pattern, income disparities (growing or reducing) among class groups and within each class
f. The type of economy - subsistence or market surplus according to classes.

g. Market malpractices, access to market at different levels, to transport, to storage facilities.
h. Organisational strengths of producers traders and consumers dominant organisations that make market mechanisms work
i. Consumption pattern of classes and in relation to gender - Quantity and quality of primary, secondary and tertiary goods -Relationship of consumption pattern to distribution pattern, production and market structures
j. Class (es) that influence and control decisions.

2. Poverty Analysis (Micro/Macro)

The number and proportion of poor (in general and with reference to gender in particular) prevalence of hunger and malnutrition, availability and accessibility to drinking water and sanitation facilities, health facilities, clothing and housing facilities, education facilities. Unemployment pattern and indebtedness; causes of poverty and inequalities; programs for poverty alleviation. Poverty line.

UNIT II

3. Analysis of Social Relations in Political System (Micro/Macro)

a. Dominant caste(s)/class(es) that influence and control the decision making process including the role of women.
b. Panchayat or the local government including gender differentials, electoral system — influence and control of electoral process. Distribution of power mode of decision-making - democratic or dictatorial, decentralised or bureaucratic.
c. Democratic decentralisation efforts and their impact.

4. Social Relations in Religion and Culture (Micro / Macro)

a. Religions represented — the role of religion in the lives of people.
b. Popular expressions of beliefs and attitudes that promote fatalism or confidence in themselves.
c. Religious and cultural customs and organisational patterns that oppose the values of social justice, equality, liberty and solidarity.

5. Analysis of Social Relation to Environment (Micro / Macro)

a. Customs, mores, rules, regulations that are eco-friendly and that are not eco-friendly.
b. Changing patterns of production and consumption — organic farming, soil and water conservation measures, recycling of wastes, use of bio-degradable articles etc., impact of these in the communities.

UNIT III

6. Concept of organization in development.

a) Collective action as distinct from individual action.
b) Need for collective action - Improving production and productivity, improving accessibility to resources, gaining strength.

7 Leadership patterns

a) Traditional leadership - roles and functions - advantages, disadvantages
b) Emerging leadership - Shared [leadership
c) Leadership and community organisation for development.

8. Ideology of community organisation

a) School dynamics in the village community / urban slums.
b) Social structure as basis for social dynamics in operation.
c) Social justice and equality of opportunities - empowering the weaker section

References

1. Desrochers, John (1977): Methods of Societal Analysis, Bangalore, India, Centre for Social Action.
2. Desrochers, John (1980): Caste in India Today, Bangalore, India, Centre for Social Action.
3. Desrochers, John (1984): Classes in India Today, Bangalore, India, Centre for Social Action.
4. Dietrich, Gabriela (1978): Culture, Religion and Development, Bangalore, India, Centre for Social Action, India.
5. Desrochers, John (1984): India's Search for Development and Social Justice, Analysis of Indian Society. The Development Debate, Bangalore, India, Centre for Social Action.
6. Dhurato, Barreto (1984); India's Search for Development and Social Justice, Analysis of Indian Society. The Indian Situation, Bangalore, India, Centre for Social Action.
7. Chamber, Robert (1992): Rural Appraisal, Rapid, Relaxed and Participatory, Discussion paper, 311, IDS, Sussex University, Brighton, BNI 9E, England.
8. Mukherjee, Neel (1992): Villagers' Perception of Rural Poverty through the Mapping Methods of Participatory Rural appraisal or participatory Learning Methods: PRA / PALM Series, No.2, Service Road, Domlur Layout, Bangalore — 560 071. MYRADA.
9. Engberg, Lila E. (1990): Rural Households and Resource Allocation for Development — An Ecosystem Perspective, Guidelines for Teaching and Learning, Rome, FAO.
10. Singh, K. (1980): Principles of Sociology, Lucknow, Prakashan Kendra.
11. Thingalaya, N.K. (1986): Rural India — Real India, Bombay, Himalaya Publishing House. Alvinyso (1990): Social Change and Development, Madras, Sage Publications Pvt. Ltd.
12. Subramaniya, K.N. (1988): Economic Development and Planning in India, New Delhi, Deep and Deep Publication. Desai, Vasant (1990): A Study of Rural Economics — Systems Approach, New Delhi, Himalaya Publishing House. Agarwal, A.N. (1994): Indian Economy, Problems of Development and Planning, Madras, Wiley Eastern Ltd. Mann, Peter H. (1985): Methods of Social Investigation, Basil Blackwell.
13. Oakley, Peter and David, Marsden (1984): Approaches to Participation in Rural Development — Published on behalf of the ACC Task Force on Rural Development, Geneva, International Labour Office.

Journals

1. Changing Villages, PPS Gussain for Consortium on Rural Technology, D-320, Laxmi Nagar, New Delhi — 110 092.
2. Journal of Rural Development, The National institute of Rural Development, Rajendranagar, Hyderabad —500 029.
3. Social Welfare, Central Social Welfare Board, Samaj Kalyan Bhavan, B-12, Tana Crescent, Institutional Area, South of IIT, New Delhi — 110 016.
4. Kurukshetra, Director, Publications Division Ministry of I & B, Government of India, Patiala House, New Delhi — 110 001.
5. Yojana, Director, Publications Division, Patiala House, New Delhi-110 001.

COMPULSORY PAPER- II

GENERAL ENGLISH

Hours/Week:4 **Max. Marks: 50**
Duration of Examination: 3 hrs Internal Assessment :10

Note: Examiner is requested to set the question paper of 40 marks only. Each question paper is divided into three parts, Part- A, Part B and Part C.
Candidates are required to secure minimum passing mark in this paper. The marks obtained in this paper will not be included in the grand total of the paper.

Part A: (8 marks) is compulsory and contains 8 questions (20 words each) at least 1 questions from each unit. (Each question is of 1 mark)

Part B: (8 marks) is compulsory and contains 4 questions (50 words each) at least 1 questions from each unit. (Each question is of 2 marks)

Part C: (24 marks) is compulsory and contains 6 questions, 2 from each unit (400 words each) candidate is required to attempt 3 questions, one from each unit. (Each question is of 8marks)

Objectives: To develop English language skills (both written and spoken) in students

Contents:

UNIT I

1. **Grammar and Usage:** Basic Sentence Pattern, simple, complex and compound sentences, writing titles, slogans, notices, announcements, circulars, report writing, summaries for business purposes, vocabulary building, phrasal verbs, parts of sentences.

UNIT II

2. Situational writing, Dialogue, making announcements, Resume Writing, Comprehension, Composition, Business letters.

UNIT III

3. Modals, Determiners, Tenses and their sequence, Passive Voice, Punctuation.

References:

1) Sharma I. K. and Singh V.D. A A Practical Course in English, Jaipur Publishing House, Jaipur.

2) Hornby, A.S. Advanced learners dictionary of current usage, Oxford University Press

SEMESTER III

Paper 9

FOOD MICROBIOLOGY, HYGINE AND SANITATION

Hours/Week:5 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Note: Each theory paper is divided into three parts, Part- A, Part B and Part C.

Part A: (10 marks) is compulsory and contains 10 questions (20 words each) at least 3 questions from each unit. (Each question is of 1 mark)

Part B: (10 marks) is compulsory and contains 5 questions (50 words each) at least 3 questions from each unit. (Each question is of 2 marks)

Part C: (30 marks) is compulsory and contains 6 questions (400 words each) candidate is required to attempt 3 question one from each unit. (Each question is of 10 marks)

Objectives-

This course will enable the students to-

1. Understand the nature of microorganisms involved in food- spoilage, food-infections and intoxications.
2. Understand the importance of microorganisms in food biotechnology.
3. Understand the principles of various methods used in the prevention and control of the microorganisms in foods.
4. Understand the criteria for microbiological safety in various food operations to avoid public health hazards due to contaminated foods.

Contents-

UNIT I

1. Brief history of food microbiology and introduction to important microorganisms in foods.
2. Primary sources of microorganisms in foods, methods of detection and isolation.
3. **Fundamentals of control of microorganisms in food-**
   Extrinsic and intrinsic parameters affecting growth and survival of microbes- use of high and low temp., dehydration, freezing, freeze-drying, irradiation and preservatives in food preservation.

UNIT II

4. **General principles underlying spoilage-**
   - Contamination and microorganisms in the spoilage of different kinds of foods and their prevention.

- Cereals and cereal products, vegetable and fruits, fish and other sea foods, meat and meat products, eggs and poultry, milk and milk products, canned foods.

5. **Food borne infections and intoxications-** symptoms, mode and source of transmission and methods of prevention. Investigation and detection of food borne disease outbreak.

UNIT III

6. **Microbes used in food biotechnology.** Fermented foods and their benefits- Bread, Vinegar, Cheese and Sauerkraut.
7. Microbiology in food sanitation.
8. Food control and enforcement agencies.

References-

1. Frazier,W.C. and Westholf, D.C. (1988): Fourth Edition, Food Microbiology, McGraw Hill Inc.
2. Jay James, M. (1986): Third Edition, Modern Food Microbiology, Van Nostarnd Reinhold Company Inc.
3. Pelezar, M.I. and Reid, R.D. (1978): Microbiology, McGraw Hill book Company, New York.
4. Benson Herold, J. (1990): Microbiological applications, Wn. C. Brown Publishers, U.S.A.
5. Collins, C.H. and Lyne, P.M. (1976): Microbiological methods, Buttersworth, London.

Paper 10

NUTRITIONAL BIOCHEMISTRY

Hours/Week:5 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Note: Each theory paper is divided into three parts, Part- A, Part B and Part C.

Part A: (10 marks) is compulsory and contains 10 questions (20 words each) at least 3 questions from each unit. (Each question is of 1 mark)

Part B: (10 marks) is compulsory and contains 5 questions (50 words each) at least 3 questions from each unit. (Each question is of 2 marks)

Part C: (30 marks) is compulsory and contains 6 questions (400 words each) candidate is required to attempt 3 question one from each unit. (Each question is of 10 marks).

Objectives-

This course will enable the students to-

1. Develop an understanding of the principles of biochemistry (as applicable to human nutrition).
2. Obtain an insight into the chemistry of major nutrients and physiologically important compounds.
3. Understand the biological processes and systems as applicable to human nutrition.
4. Apply the knowledge acquired to human nutrition and dietetics.

Contents:

UNIT I

1. **Introduction to biochemistry** – Definition, objectives, scope and inter- relationship between biochemistry and other biological sciences.

2. **Carbohydrates**- Definition, classification, structure and properties of

- Monosaccharides- glucose, fructose, galactose
- Disaccharides- maltose, lactose, sucrose
- Polysaccharides- dextrin, starch, glycogen.

3. **Lipids**- Definition and classification of lipids, types and properties of

- Fatty acids, composition and properties of fats, significance of Acid value, Iodine value and saponification value,
- Classification and structure of phospholipids, structure of glycolipids, types and structure of sterols.
- Lipoproteins- definition and types

4. **Proteins**- definition, classification, structure and properties of

- Amino acids, essential and non- essential amino acids
- Definition, classification, structure, properties and functions of proteins.

UNIT II

5. **Enzymes**- definition, types and classification of enzymes

- Definition and types of coenzymes
- Factors affecting velocity of enzymes catalysed reactions
- Enzyme inhibition

6. **Molecular aspects of transport**- passive diffusion, facilitated diffusion, active transport

7. **Intermediary metabolism**- general consideration.

- Carbohydrates- glycolysis, gluconeogenesis, glycogenesis, glycogenolysis, blood sugar regulation.
- Lipids- oxidation and biosynthesis of fatty acids. Synthesis and utilization of ketone bodies, ketosis, fatty livers.
- Proteins- deamination, transamination

8. **Biological oxidation**- Citric acid cycle, Electron transport chain,

- Oxidative phosphorylation, energy conservation, high energy phosphate bond.

UNIT III

9. Fluid, electrolyte and acid- base balance. Water.

10. **Vitamins**- chemistry and biochemical role of fat soluble vitamins- A, D, K & E. Water soluble vitamins- B Complex & C.

11. **Minerals**- Biochemical role of Inorganic elements.

12. **Hormones**- Biological role of hormones of- Pituitary, Adrenal, Thyroid, Parathyroid, Pancreas.

References-

1. West, E.S., Todd, W.R., Mason, H.S. and Van Bruggen, J.T. (1974): 4th Ed. Text book of biochemistry, Amerind Publishing Co. Pvt. Ltd.
2. White, A., Handlar, P., Smith E.L., Stelten, D.W. (1959): 2nd Ed. Principles of biochemistry, McGraw Hill Book Co.
3. Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. (1993): 23rd Ed. Harper's Biochemistry. Lange medical book.
4. Lehinger, A.L., Nelson, D.L. and Cox, M.M. (1993): 2nd Ed. Principles of Biochemistry, CBS Publishers and distributors.
5. Devlin, T.M. (1986): 2nd Ed. Text book of Biochemistry with Clinical Correlations, John Wiley and sons.
6. Stryer, L. (1995): Biochemistry, Freeman WH and Co.

Paper 10
NUTRITIONAL BIOCHEMISTRY
PRACTICAL

Hours/Week:5 **Max. Marks: 50**

Duration of Examination: 3 hrs Main Exam:40

Internal Assessment :10

Objectives-

This course will enable the students to-

1. Be familiar with qualitative tests and quantitative determinations.

1. **Carbohydrates**

- Reactions of mono, di and polysaccharides and their identification in unknown mixtures.
- Estimation of reducing and total sugars in foods.
- Estimation of lactose in milk.

2. **Fats**

- Reactions of fats and oils.
- Determination of Acid value, Saponification and Iodine number of natural fats & oils.
- Estimation of crude fat content of foods by Soxhlet's method.

3. **Proteins**

- Reactions of proteins in foods.
- Electrophoresis
- Estimation of total N of foods by Kjeldahl method.

4. **Vitamins**

- Estimation of ascorbic acid content of foods by titrimetric method/ colorimetric method.

5. **Minerals**

- Fluorimetry- general principle
- Estimation of calcium
- Estimation of chloride
- Estimation of phosphorus

References-

1. Oser, B.L. (1965): 14th Ed. Hawk's physiological chemistry, McGraw Hill book Co.
2. William, S.: 16th Ed. JAOAC, Official methods of analysis of the association of Official Analytical Chemists.
3. Indian Standards Institution, (1985): ISI Hand book of food analysis, Part I to XI. Manak Bhawan, New Delhi.
4. Varley, H., Gowenlock, A.H. and Bell, M. (1980): 5h Ed. Practical and clinical chemistry, Vol-I, William Heinemann medical books Ltd.
5. Sundararaj, P. and Siddhu, A., (1995): Qualitative tests and quantitative procedures in biochemistry – a practical manual, Wheeler Publishing.

Paper 11

NUTRITION THROUGH LIFE CYCLE

Hours/Week:5 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Note: Examiner is required to set the question paper of 40 marks only. Each question paper is divided into into three parts Part- A, Part B and Part C.

Part A: (8 marks) is compulsory and contains 8 questions (20 words each) at least 1 question from each unit. (Each question is of 1 mark).

Part B: (8 marks) is compulsory and contains 4 questions (50 words each) at least 1 question from each unit. (Each question is of 2 marks).

Part C: (24 marks) is compulsory and contains 6 questions (400 words each) candidate is required to attempt 3 questions one from each unit. (Each question is of 8 marks).

Objective:

This course should enable the students to-

1. Understand the physiology of pregnancy and lactation and how these influence nutritional requirements.
2. Learn the benefits of the breast feeding.
3. Be aware of the problems encountered in pregnancy and during breast feeding and how to cope with these problems.
4. Understand the process of growth and development from birth until adulthood.
5. Get familiar with the nutritional needs of different stages of growth.
6. Understand the concept of growth promotion.

Contents:

UNIT I

1. **Nutrition During Pregnancy-** Physiology of pregnancy, factors (non-nutritional) affecting pregnancy outcome, impertinence of adequate weight gain during pregnancy, antenatal care and its schedule, Nutritional requirements during pregnancy and modification of existing diet and supplementation, nutritional factors affecting breast- feeding. Deficiency of nutrients and impact- energy, protein iron, folic acid, calcium, iodine. Common problems of pregnancy and their management- nausea, vomiting, pica, food aversions, pregnancy induced hypertension, obesity, diabetes. Adolescent pregnancy.

2. **Nutrition during Lactation and Physiology of Lactation-** Nutritional requirements during lactation and dietary management, food supplements, Galactogogues, preparation for lactation. Care and preparation of nipples during breast hygiene.

3. **Nutrition during Infancy-** Infant physiology relevant to feeding and care. Breast feeding- Colostrum, its composition and importance in feeding. Initiation of breast feeding. Nutritional and other advantages of breastfeeding. Introduction of complementary foods, initiation and management of weaning, breast feeding etc. Bottle feeding- circumstances under which bottle feeding is to be given. Care and sterilization of bottles. Preparation of formula. Mixed feeding- breast feeding and artificial feeding. Teething and management of problems. Immunization.

UNIT II

4. **Management of preterm and low birth weight children.**
5. **Growth and development from infancy to adulthood-** Somatic, physical, brain and mental development, puberty, menarche, prepubertal and pubertal changes. Importance of nutrition for ensuring adequate growth and development.
6. **Nutritional needs of Toddlers, Preschool, School going children and Adolescents- Dietary management.**

UNIT III

7. **Dietary management of Children with Inborn Errors of Metabolism**
   (PKU, Glycogen Storage Disease, Wilsons disease), Malabsorption (Lactose Intolerance, Celiac disease), Food Allergies.

8. **Nutrition and Health care programmes for mother and child**
   ICDS and role of primary health centres

References

1. Gosh, S. (1992): The Feeding and Care of Infants and Young Children VHAI, 6th Ed., New Delhi
2. Swaminathan , M. (1985): Esssentials of Food and Nutrition, Vol. I and II. Ganesh & Co. Madaras.
3. King, M.H., King, F.M.A., Morley, D., Burgess, A.P. (1972): Nutrition for Developing Countries, ELBS Oxford University Press.
4. Indian National Code for Protection and Promotion of breast feeding, Govt. of India. Ministry of Social Welfare, New Delhi, 1983.
5. Indian Council of Medical Research (1989): Recommended Dietary Intakes for Indians.
6. Waterlow, J.C.(1992): Protein Energy Malnutrition, Edward Arnoid.
7. WHO, (1978): A Growth Chart for International Use in maternal and Child Health Care,Geneva.

Paper 11

NUTRITION THROUGH LIFE CYCLE

PRACTICAL

Hours/Week:5 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Objectives

This course should enable the students to-

1. Apply the knowledge regarding the nutritional requirements of mothers and children in various circumstances.
2. Plan appropriate diets to fulfil nutritional needs in pregnancy, lactation and for children of different ages.
3. Monitor growth of children.
4. Counsel mothers to take appropriate action to prevent growth faltering and ro rehabilitate malnourished children.
5. Train health workers for growth monitoring and promotion.

Contents

1. Preparation of nutritional recipes for Pregnant and Lactating women (home level).
2. Visit to antenatal clinic and counselling mothers at ANC.
3. Preparation of bottle feeding- Sterilization and Preparation of formula milks.
4. Preparation of supplementary / weaning food for infants.
5. Growth monitoring and Promotion- use of Growth charts and Standard Prevention of Growth faltering.

6. Preparation of nutritious snacks for children, rich in energy, protein and important micro-nutrients.
7. Preparation of packed lunch for primary school age, school age children and adolescents.

Paper 12

PROBLEMS IN HUMAN NUTRITION

Hours/Week:5 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Note:- Each theory paper is divided into three parts, part A, Part B, Part C.

Part A (10 marks) is compulsory and contains 10 questions (20 words each) at least 3 questions from each unit. (Each question is of 1 mark)

Part B (10 marks) is compulsory and contains 5 questions (50 words each) at least 3 questions from each unit. (Each question is of 2 marks)

Part C (30 marks) is compulsory and contains 6 questions (400 words each). Candidate is required to attempt 3 questions one from each Unit. (Each question is of 10 marks).

Content-

UNIT I

1) **Pathogenesis of Nutritional Deficiency diseases development-** Primary and secondary nutritional inadequacies. Concept of acute and chronic deficiency disease.

2) **Prevalence, aetiology, biochemical, clinical manifestations, preventive and therapeutic measures for**

1. Protein Energy Malnutrition
2. Vitamin A deficiency
3. Fluorosis
4. Dental Caries

3) **Prevalence, aetiology, pathology, biochemical, clinical manifestations, preventive and therapeutic measures for**

1. Rickets
2. Beri- Beri
3. Scurvy
4. Anaemia
5. Iodine Deficiency disorders.

UNIT II

4) **Nutritional problems of affluence**- aetiology, biochemical and clinical manifestations, preventive and therapeutic measures for

1. Obesity
2. Diabetes
3. Cardio vascular diseases

5) **Naturally occurring toxins and anti nutritional factors in food.**

UNIT III

6) **Incidence, aetiology, Clinical changes, treatment of-** Haemoglobinopathies- Sickle cell Anaemia, Thalassemia.

7) **Idiosyncrasies-** food intolerance, food allergies- definition, symptoms, mechanism of food allergy, diagnosis, history, food record, elimination diets, food selection.

8) **Malabsorption Syndrome-** Celiac Sprue, intestinal brush border deficiency, acquired disaccharide intolerance, dietary care in these conditions.

References:-

1. Mc Collum E.V. (1957): History of nutrition, Houghton Mifflin Co.
2. Waterlow J.C. (1992): Protein Energy Malnutrition, Edward Arnold, A division of Hodde and Stoughton.
3. Gopalan, C(1993): Recent trends in nutrition, oxford university press.
4. De Maeyer, E.M.(1989): Preventing and controlling iron deficiency anaemia through primary health care, WHO.
5. Sachdeva, H.P.S., Chaudhary, P(1994) Nutrition in children developing country concerns, dept of paediatrics, Maulana Azad Medical College, New Delhi.
6. Shills, M.E. Olson, J.A. Shike, N and Ross, A.C.(1999): Modern nutrition in health and disease 9 th edition Williams and Willikins.
7. Mahan L.K. and Escott- Stump (2000): Krause's food, nutrition and diet therapy 10 th edition W.B. saunders Ltd.
8. Bamji M.S., Roa P.N., and Reddy, V.(2003): Textbook of human nutrition 2 nd Edition Oxford and IBH Publishing Co Pvt Ltd.
9. Passmore, R and Eastwood, M.A. (1986): Human Nutrition and Dietetics EIBS/ Churchill Livingstone.
10. Swaminathan, M.S.(1995): Essentials of Food and Nutrition Vol I Fundamental Aspects Vol II Applied Aspects, The Banglore Printing and Publishing Co Banglore.
11. Shukla, P.K., (1990): Nutritional Problems of India.
12. Robinson C.H., Lawler, M.R. Chenoweth, W.L. and Garwick, A.W(1986): Normal and Therapeutic Nutrition16 th edition Macmillan Publishing Co. New Delhi.
13. Brigg's G.M. nad Calloway, D.H. (1984): Nutrition and Physical fitness 1st edition Rinichart and Winston, New York, Chicago, san Fransisco.

SEMESTER IV

Paper 13

DIET THERAPY I

Hours/Week:5 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Note: Examiner is required to set the question paper of 40 marks only. Each question paper is divided into into three parts Part- A, Part B and Part C.

Part A: (8 marks) is compulsory and contains 8 questions (20 words each) at least 1 question from each unit. (Each question is of 1 mark).

Part B: (8 marks) is compulsory and contains 4 questions (50 words each) at least 1 question from each unit. (Each question is of 2 marks).

Part C: (24 marks) is compulsory and contains 6 questions (400 words each) candidate is required to attempt 3 questions one from each unit. (Each question is of 8 marks).

Objectives-

This course will enable the student to –

1. Know the principles of diet therapy.
2. Understand the modifications of normal diets for therapeutic purposes.
3. Understand the role of the dietician

Contents:

UNIT I

1. **Basic concepts of diet therapy-**
   Therapeutic adaptations of normal diet, principles and classification of therapeutic diets. Routine hospital diets- Regular, light, soft, fluid , Parenteral and enteral feeding.
2. **Energy modifications and nutritional care for weight management-**
   Identifying the overweight and obese, etiological factors contributing to obesity, prevention and treatment, low energy diets, balanced energy reduction and behavioural modification. Underweight – aetiology and assessment, high energy diets for weight gain, anorexia nervosa and bulimia.

UNIT II

3. **Etiological factors, symptoms, diagnostic tests and management of-**
   Upper GI tract disease- Diseases of oesophagus and dietary management, Diseases of stomach and dietary management. Gastric and duodenal ulcers and dietary management.
4. **Aetiology, symptoms, diagnostic tests and management of-**

Intestinal diseases- Diarrhoea, Steatorrhoea, Diverticular disease, inflammatory Bowel disease, Ulcerative Colitis. Constipation, Irritable bowel Syndrome, haemorrhoids.

5. **Aetiology, symptoms, diagnostic tests and management of-**
   Malabsorption Syndrome, Celiac sprue, Tropical sprue. Intestinal brush border deficiencies (Acquired Disaccharide Intolerance).

UNIT III

6. **Anemia-**
   Pathogenesis and dietary management- Nutritional Deficiency Anemia- Pernicious, megaloblastic and Iron deficiency anemia.
7. **Diseases of the Liver, Exocrine Pancreas and Biliary System-**
   i. Liver function tests and Nutritional care in liver disease in the context of results. Dietary care and management in- Viral Hepatitis, Cirrhosis of liver, Hepatic Encephalopathy, Wilson's disease.
   ii. Dietary care and management in diseases of Gall Bladder and
   iii. Pancreas- Cholelithiasis, cholecystitis, pancreatitis etc.

References-

1. Anderson, L., Dibble, M.V., Turkki, P.R., Mitchall, H.S., and Rynbergin, H.J. (1982): Nutrition in Health and disease, 17th Ed., J.B. Lippincott & Co. Philadelphia.
2. Antia, F.P. (1973): Clinical Dietetics and Nutrition, Second Edition, Oxford University Press, Delhi.
3. Mahan, L.K., Arlin, M.T., (1992): Krause's Food Nutrition and Diet Therapy, 8th Ed. W.B. Saunders Company, London.
4. Robinson, C.H., Lawler, M.R., Chenoweth, W.L., and Garwick, A.E. (1986): Normal and Therapeutic Nutrition, 17TH Ed., MacMillan Publishing Co.
5. Williams, S.R. (1989): Nutrition and Diet Therapy, 6th Ed. Times Mirror/ Mosby College Publishing, St. Louis.
6. Raheena, Begum (1989): A Textbook of foods, nutrition and dietetics. Sterling Publishers, New Delhi.
7. Joshi, S.A. (1992): Nutrition and Dietetics, Tata McGraw Hill Publications, New Delhi.

Paper 13

DIET THERAPY I

PRACTICAL

Hours/Week:5 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Objectives-

To enable students to-

1. Know the normal routine diet served in hospitals and for whom these would be served.

2. To be able to plan diets for therapeutic purposes.

Content-

1. Planning and preparation of fluid food preparations- clear fluid preparations, full fluid preparations. Planning and preparation of fluid diet- clear and full fluid.
2. Planning and preparation of recipes for soft/ semisolid diet- mechanical, pureed. Planning and preparation of soft diet.
3. Planning and preparation of low fat and low calorie recipes.
4. Planning and preparation of High fibre recipes.
5. Planning and preparation of Low fibre and low residue recipes.
6. Planning and preparation of Bland diet recipes.
7. Planning and preparation of Diets for the following conditions-
   Overweight and obesity, ulcers, diarrhoea, constipation, viral hepatitis, liver cirrhosis, nutritional anemia.

Paper 14

COMMUNITY NUTRITION

Hours/Week:5 **Max. Marks: 50**

Duration of Examination: 3 hrs Main Exam:40

Internal Assessment :10

Note: Examiner is required to set the question paper of 40 marks only. Each question paper is divided into into three parts Part- A, Part B and Part C.

Part A: (8 marks) is compulsory and contains 8 questions (20 words each) at least 1 question from each unit. (Each question is of 1 mark).

Part B: (8 marks) is compulsory and contains 4 questions (50 words each) at least 1 question from each unit. (Each question is of 2 marks).

Part C: (24 marks) is compulsory and contains 6 questions (400 words each) candidate is required to attempt 3 questions one from each unit. (Each question is of 8 marks).

Objectives:

This course will enable the students to-

1. Understand the factors that determine the availability and consumption of food.
2. Be familiar with the common nutritional problems of the community, their causes, symptoms, treatment and prevention.
3. Get exposed to the schemes, programmes and policies of Government of India to combat Malnutrition.

4. Be aware of the health hazards related to food and water.

Content-

UNIT I

1. **Concept and scope of Community Nutrition**

2. **Food availability and factors affecting food availability and its consumption.**

    a. Agricultural Production

    b. Post –harvest handling, marketing and distribution

    c. Population

    d. Economic

    e. Regional

    f. Socio- cultural

    g. Industrialization

UNIT II

3. **Nutritional problems of the community and implications for public health**

    a. Common problems in India

    b. Causes (Nutritional and non-nutritional)

    c. Incidence of nutritional problems. Signs and symptoms, treatment

        i. PEM

        ii. Micro- nutrient deficiencies (Vit. A, Iron, Iodine)

        iii. Flourosis

4. **Schemes and programmes to combat nutritional problems in India**

    a. Prophylaxis programmes

    b. Midday meal programmes

    c. ICDS

UNIT III

5. **Hazards to Community Health and Nutritional Status**

    a) Adulteration in food

b) Pollution of water

c) Industrial Offence sewage

d) Pesticides residues in Food

6. Nutritional Policy in India and Plan of Action

Refernces

1. Agarwal, A.N. (1981) : Indian economy problems of development and planning. Jelliffe, D.B. (1968): Child Health in the tropics.
2. Ghosh, S.K. and Puri, V.K. (1992): Indian Economy. Shukla, P.K. (1982): Nutritional Problems of India. Thankkamma Jacob (1976): Food adulteration.
3. Park, J.E. and Park, K. (1994): Text book of preventive and social medicine. Prevention of Food Adulteration Act (1994): Govt. of India

Paper 15
NUTRITIONAL ASSESSMENT AND SURVEILLANCE

Hours/Week:5 **Max. Marks: 50**

Duration of Examination: 3 hrs Main Exam:40

Internal Assessment :10

Note: Examiner is required to set the question paper of 40 marks only. Each question paper is divided into three parts Part- A, Part B and Part C.

Part A: (8 marks) is compulsory and contains 8 questions (20 words each) at least 1 question from each unit. (Each question is of 1 mark).

Part B: (8 marks) is compulsory and contains 4 questions (50 words each) at least 1 question from each unit. (Each question is of 2 marks).

Part C: (24 marks) is compulsory and contains 6 questions (400 words each) candidate is required to attempt 3 questions one from each unit. (Each question is of 8 marks).

Objectives

This course should enable students to-

1. Understand the concept of nutritional status and its relationship to health.
2. Know the aims and objectives for assessing the nutritional status of an individual and the community.
3. Know the methods used for assessment of nutritional status.
4. Know the extent and types of malnutrition prevalent in the country and region.
5. Identify the factors responsible for the malnutrition.

UNIT I

Nutritional status assessment and surveillance.

Meaning, need, objectives and importance.

1) **Direct nutritional assessment of human groups**
   Clinical signs, nutritional anthropometry, biochemical tests, biophysical methods.

2) **Diet Surveys**
   Need and importance, methods of dietary survey. Interpretation- concept of consumption unit, intra and inter individual distribution in family. Adequacy of diet with respect to RDA, concept of family food security.

3) **Clinical signs**
   Need and importance, identifying signs of PEM, Vitamin A deficiency and iodine deficiency. Interpretation of descriptive list of clinical signs.

4) **Nutritional anthropometry**
   Need and importance, standards for reference, techniques of measuring height, weight, head, chest and arm circumference, interpretation of these measurements and use of growth charts.

UNIT II

5) **Rapid Assessment Procedures**- need and importance, technique, interpretation

6) **Secondary sources of community health data**
   Sources of relevant vital statistics, importance of infant, child and maternal mortality rates. Epidemiology of nutritionally related diseases.

UNIT III

7) **Sociological Factors in the aetiology and prevention of Malnutrition**

   Food Production and availability, socioeconomic factors, food consumption, medical and educational services, emergency/ disaster conditions, famine, floods and war.

8) **Surveillance Systems**
   International, National, Regional, and Community.

References

1. Jelliffe, D.B. (1966): Assessment of the Nutritional Status of the Community, World Health Organisation.
2. Sain, D.R., Lockwood, R., Scrimshaw, N.S. (1981): Methods for the evaluation of the impact of Food and Nutrition Programmes, United Nations University.
3. Ritchie, J.A.S.(1967): Learning Better Nutrition, FAO, Rome.
4. Gopalan, C: Nutrition and Health Care, Nutrition Foundation of India. Special Publication Series.

5. Beghin, I, Cap, M., Dujardan, B.(1988): A guide to Nutritional Status Assessment, W. H.O., Geneva.
6. Gopaldas, T. and Seshadri, S. (1987): Nutrition Monitoring and assessment, Oxford University Press.
7. Mason, J.B., Habicht, J.P., Tabatabai, H., Valverde, V. (1984): Nutritional Surveillance, W.H.O.

Paper 15

NUTRITIONAL ASSESSMENT AND SURVEILLANCE PRACTICAL

Hours/Week:5 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Objectives

This course should enable students to-

1. Take various anthropometric measurements for individuals of different ages.
2. Assess the nutritional status of individuals and the communities.
3. Know the merits and limitations of various parameters used to assess nutritional status.
4. Collect data on food and nutrient intake.
5. Know the significance and importance of various biochemical parameters.
6. Train grassroots level workers in anthropometry and its interpretation.

Note: Each student should be given the opportunity to do the measurements individually such that they develop necessary skills.

Content

1. Measurements of infant length, height, weight, circumference measurements, head, chest, mid upper arm , waist, hip , precautions to be taken.
2. Body Composition analysis through Body Composition Analyser.
3. Growth Charts- plotting growth charts. Growth monitoring and promotion
4. Clinical Assessment and signs of nutrient deficiency for-
    i. PEM, Vitamin A deficiency, Anaemia, Rickets, Iodine deficiency, B complex deficiencies.
5. Biochemical parameters commonly used for assessing nutritional status.
    ii. Proteins- Total protein, albumin,
    iii. Iron- Haemoglobin, Transferrin, Ferritin
    iv. Lipids- Lipid profile.
6. Estimating food and nutrient intake- household food consumption data, per consumption unit, 24 hour recall. Food Record, Food Diary. Merits and limitations of each.
7. Field visits for surveillance systems used in nutrition and health programmes.

Paper 16

FOOD SCIENCE AND CHEMISTRY

Hours/Week:5 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Note: Examiner is required to set the question paper of 40 marks only. Each question paper is divided into into three parts Part- A, Part B and Part C.

Part A: (8 marks) is compulsory and contains 8 questions (20 words each) at least 1 question from each unit. (Each question is of 1 mark).

Part B: (8 marks) is compulsory and contains 4 questions (50 words each) at least 1 question from each unit. (Each question is of 2 marks).

Part C: (24 marks) is compulsory and contains 6 questions (400 words each) candidate is required to attempt 3 questions one from each unit. (Each question is of 8 marks).

Objectives:

This course will enable students to

1. Get acquainted with the composition of different food stuffs.
2. Understand the chemistry of foods and food systems.
3. Apply the theoretical aspects in ensuring food quality.

Content:

UNIT I

1. **Introduction o Food Science and Chemistry-** Approach to the study of Food Science and Chemistry- quality and safety attributes, chemical and biochemical reactions, effect of reactions on quality and safety of food.
2. **Physical Foundation of Food Science-** Solids and amorphous foods, liquids and role in food products, gases and role in food products, true solutions, dispersions and suspensions, sols, gels, foams and emulsions.
3. **Carbohydrates-** Classes, types, structure and food sources. Chemical reaction in foods- hydrolysis, thermal degradation, dehydration, caramelization. Maillard Reaction structure function and relations of Carbohydrates. Applications in food industry**.**
4. **Cereals and Cereal Products-** Types of Cereals, composition and structure of cereal grains. Starch- types and structure (Modified and Unmodified). Functional properties of starch. Gelatinization- factors affecting gelatinization. Gelation- factors affecting gelation. Retro gradation. Dextrinization. Criteria for selecting a starch.

UNIT II

5. **Lipids (Fats and Oils) -** Classification and sources. Chemistry of lipids- physical and chemical reactions in foods. Steps in manufacture of food fats, Role of fat and

applications in food preparation. Shortenings- shortening value and factors affecting it. Selection of fats and oils, Fat substitutes. Deterioration of fats and oils- rancidity, reversion and polymerization.

6. **Proteins-** Composition, types and physiochemical properties of amino acids and proteins. Hydrolysis. Denaturation of proteins. Functional properties of proteins- hydration, solubility, viscosity, gelation, texturization, emulsification, binding, foaming, Maillard reaction and Browning.

7. **Milk and Milk Products-** Composition of milk, milk products and process used for production (in brief). Uses in cookery, effect of heat, enzymes, acid and salts on milk and milk products.

8. **Eggs-** Structure, composition and quality of eggs. Functional properties and uses in cooking. Foam- (Yolk, White) and uses/ applications.

UNIT III

9. **Meat, Fish, Poultry and Gelatin-** Classification, structure and composition. Identification of meat cuts, factor affecting quality. Changes effected by processing and cooking, including heat curing, pH, salt. Meat tenderizers, Gelatin- composition, properties and uses.
10. **Sugar and Sugar Cookery-** Physical and functional properties. Applications in food preparation. Selection of sweetening agents and artificial sweeteners.

11. **Food Additives**- Anti-spoilage agents, antioxidants, nutrients, surface active agents, leavening agents, colorants, gums, starches and enzymes, polyhydric alcohols, sequestrants, acidulants and alkaline compounds. Permitted substances, types and uses in food industry.

12. **Fruits and Vegetables**- Structure and composition, changes, occurring during maturation and ripening, post-harvest changes and storage. Pigments- types and effect of heat, pH and cooking. Browning and its prevention. Pectin, gums and application in food industry.

References:

1. Baianu,I.C.(Editor): Physical Chemistry of Food Processes, Vol. 1. Fundamental Aspects, AVI Books, New York.
2. Fennema, O.R.(Editor)(1885): Food Chemistry, 2nd Edition, Marcel Dekker Inc., New York.
3. Wong, D.W.S. (1898): Mechanism and Theory in Food Chemistry, AVI Books, van Nostrand Reinhold,New York.
4. Ronsivalli, L.J. and Vieira, E.R. (1992): Elementary Food Science, 3rd Ed. Chapman & Hall, New York

SEMESTER V

Paper 17

DIET THERAPY II

Hours/Week:5 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Note: Examiner is required to set the question paper of 40 marks only. Each question paper is divided into into three parts Part- A, Part B and Part C.

Part A: (8 marks) is compulsory and contains 8 questions (20 words each) at least 1 question from each unit. (Each question is of 1 mark).

Part B: (8 marks) is compulsory and contains 4 questions (50 words each) at least 1 question from each unit. (Each question is of 2 marks).

Part C: (24 marks) is compulsory and contains 6 questions (400 words each) candidate is required to attempt 3 questions one from each unit. (Each question is of 8 marks).

Objectives-

This course will enable the students to -
1.Understand the role of the dietician in preventive, promotive and curative health care.
2. Be able to make appropriate dietary modification s for various disease conditions based on the pathophysiology.

Content-

UNIT I

1. **Diet in disease of the endocrine pancreas-Diabetes Mellitus-**
   - Classification, symptoms, diagnosis, management of diabetes mellitus-clinical Vs chemical control. Insulin therapy, oral hypoglycemic agents, glucose monitoring at home. Dietary care and nutritional therapy, meal plan (with and without insulin). Special Dietetic foods, Sweeteners and sugar substitutes. Diabetes in pregnancy, elderly, surgery, illness, Diabetic coma, insulin reaction. Juvenile Diabetes. Patient education. Hypoglycemia
   - Classification, symptoms, postprandial or reactive hypoglycemia, early alimentary and late reactive hypoglycemia, idiopathic hypoglycemia, dietary treatment.

UNIT II

2. **Diseases of the cardiovascular System-**
   - Atherosclerosis: Etiology and risk factors.
   - Hyperlipidemias-Brief review of lipoprotein and their metabolism, classification of hyperlipidemias. Clinical and nutritional aspects of hyperlipidemias. Dietary care. Ischemic Heart Disease-nutritional management. Congestive heart disease and nutritional management.

- Hypertension-etiology, prevalence, nutrition al management and prevention. Cerebrovascular disease and Diet.

3. **Renal diseases-review of physiology and function of normal kidney**
   - Diseases of kidney-classification, etiology, characteristic symptoms and dietary management in :glomerulonephritis-acute and chronic, Nephritis syndrome, renal failure and Uramia, acute and chronic renal failure. Dietary management in renal dialysis and renal transplant. Chronic renal failure in patients with diabetes millions and children. Nephrolithiasis. Use of sodium and potassium exchange lists.

UNIT III

4. **Allergies**
   Definition, symptoms, diagnosis and dietary management. Food selection. Food allergy in infancy.
5. **Cancer-nutritional and non nutritional etiological factors**
   Management of cancer patients in relation to the clinical treatment and cachexia.

6.Surgery, trauma and burns-

Physiological changes in relation to trauma. Assessment of the nutritional status in surgical and burn patients. Pre-operative and post -operative nutritional care. Nutritional care in trauma. Nutritional management of burn patients.
Interactions between drugs, nutrients and nutritional status (brief).

References-

Anderson,L.,Dibble,M.V., Turkki, P.R.,Mitchell. H.S. and Rynbergin, H.J.(1982): Nutrition in Health and Disease,17th Ed J.B.Lippincott & Co.Philadelphia.
Antia,F.P.(1973):Clinical Dietetics and Nutrition, Second Edition,Oxford University Press, Delhi.
Mahan,L.k.,Arlin,M.T.(1992):Krause's Food, Nutrition and Diet Therapy, 8th Ed,W.B.Saunders Company, London.
Robinson,C.H.,Lawler,M.R.,Chenoweth, W.L., and Garwick, A.E.(1986):Normal and Therapeutic Nutrition, 17th Ed.MacMillan Publishing Co.
Williams,S.R.(1989):Nutrition and Diet Therapy,6th Ed.,Times Mirror/Mosby College Publishing, St.Louis.

Paper 17

DIET THERAPY II

PRACTICAL

Hours/Week:5 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Objectives-

To enable students to apply the principles of planning therapeutic diets for various disease conditions.

Content-

1. **High Risk Management (hospital based) Nutrition Assessment**
   Review of existing practices in hospital oral supplements indigenous/home based and commercial for stressed patients- Burns, surgery, cancer, debilitated patients. Management of patients with feeding problems. Tube feeds- all forms, elemental and Parenteral.
2. **Diabetes Mellitus**
   Planning and preparation of diets. Without insulin, with insulin, adult and Juvenile, Diabetes in Pregnancy, Diabetes and illness.
3. **Managing, patients with hypoglycemic conditions.**
4. **Diseases of Cardiovascular system**
   Formulation of low cholesterol and low sodium recipes, planning and preparation of diets for hypertension, CHD, Congestive heart failure during acute, Chronic and convalescent conditions. Progressive dietary management for Cardiac transplantation and cardiac surgery.
5. **Protein and mineral modifications for patients with renal disease**
   Planning and preparation of diet for Glomerulonephritis- acute and chronic, Nephrotic syndrome, nephrolithiasis, renal failure- acute and chronic, dialysis.
6. **Diet for patients with Neoplasia**
7. **Elimination diets for allergy**
8. **Low purine diet**

Paper 18
INSTITUTIONAL FOOD SERVICE MANAGEMENT

Hours/Week:5 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Note: Examiner is required to set the question paper of 40 marks only. Each question paper is divided into into three parts Part- A, Part B and Part C.

Part A: (8 marks) is compulsory and contains 8 questions (20 words each) at least 1 question from each unit. (Each question is of 1 mark).

Part B: (8 marks) is compulsory and contains 4 questions (50 words each) at least 1 question from each unit. (Each question is of 2 marks).

Part C: (24 marks) is compulsory and contains 6 questions (400 words each) candidate is required to attempt 3 questions one from each unit. (Each question is of 8 marks).

Objectives:

This course will enable the students to-

1. Gain knowledge of the types of food services in India and the Factors which have led to their development.

2. Understand the special characteristics of food service establishments.
3. Know the types of resources required for managing food outlets.
4. Maximize resource use.
5. Learn manpower management techniques.
6. Understand human relations and behavior at work.
7. Know the types of costs involved and how to control them.
8. Maintain and analyze accounting information for decision making.
9. Think of starting a food service.

UNIT I

1. Introduction to Food Service Institutions

Development of Food Service Institutions in India. Characteristics of Food Service Establishments. Effects of environmental changes on different types of Establishments.

2. Food Service Management – Definitions , principles and functions, Tools of Management, Resources.

UNIT II

3. Approaches to Management

Traditional Management, Systems approach, management by objectives, Total Quality Management.

4. Management of Resources

Finance, spaces, Equipment and furniture, materials, staff, time and energy, procedures.

UNIT III

5. Personnel Management – Definition, Development and policies.

Recruitment, selection and induction, Employee benefits, training and development, human relations, Trade Union Negotiation and settlement.

6. Cost and Management accounting

Definition and scope, costs and their control, management accounting, profit planning.

References

1. Boella, M.J. (1983): Personnel Management in Hotel and Catering Industry, 3rd Ed., Hutchinson, London.
2. Drucker, P.F. (1975): Management, Allied Publishers, New Delhi.
3. Fearn, D. (1969): Management Systems for the Hotel Catering and Allied Industries. Hitchcock, M.J. (1980): Food Service Systems Administration, MacMillan, New York. Koontz, H., O. Donnel, C., Weihrich, H. (1983) : Essentials of Management, Indian ed.
4. Kotas, R. (1972) : Accounting in the Hotel and Catering industry, Intertext Books, 3rd ed.

Butler and Tanner, London.
5. Moore, C.L. and Jaedicke, R.K. : Managerial Accounting, South Western Publishing Co.
6. Sethi, M. Malhan, S. (1993) : Catering Management : An integrated approach, Wiley Eastern, New Delhi.
7. Terry, G.R. (1972) : Principles of Management , 6th Ed. Irwin Dorsey Inter-national: London.
8. West, B.B., Wood, L., Revised by Hargar, V.F., Shugart, G.S., Payne – Palacio, J. (1989) : Food Service in Institutions, 6th Ed., MacMillan Publishing Co., New York.
9. Doswell, R., Gamble, P.R. (1979) : Marketing and planning hotels and tourism projects, Barrie and Jenkins, London.
10. Kahri, W.L.(1977): Advances Modern Food and Beverage service. Prentice Hall, New Jersey. Kinder, F., Green, N.R., Harris, N. (1984): Meal Management, 6 th Ed., MacMillan, New York.
11. Kotschevar, L.H. (1975): Quantity food production, Cahners publishing, Massachusets.
12. Sethi, M., Malhan, S. (1993): Catering Management: an integrated approach, Wiley, Eatern. New Delhi.
13. Walley, B.H.(1980): Production Management Handbook, Gower Publishing, U.K.
14. Watson, O.B. (1968): School and Institutional Lunchroom management, Parker, NewYork

Paper 18

INSTITUTIONAL FOOD SERVICE MANAGEMENT PRACTICAL

Hours/Week:5 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Content-

1. **Kitchen Production and Service- Quantity food production project.**
   Planning, Organization, Presentation and service of Meals for different occasions and age groups. Table setting and Service Techniques for different types of establishments.

2. **Visit to study Food Preparation and Service**
   Hotel, Restaurant, Canteen, Nursery School, Hostel, Hospital, Orphanage or other social institution.

Paper 19
PUBLIC HEALTH AND EPIDEMIOLOGY

Hours/Week:5 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Note: Examiner is required to set the question paper of 40 marks only. Each question paper is divided into into three parts Part- A, Part B and Part C.

Part A: (8 marks) is compulsory and contains 8 questions (20 words each) at least 1 question from each unit. (Each question is of 1 mark).

Part B: (8 marks) is compulsory and contains 4 questions (50 words each) at least 1 question from each unit. (Each question is of 2 marks).

Part C: (24 marks) is compulsory and contains 6 questions (400 words each) candidate is required to attempt 3 questions one from each unit. (Each question is of 8 marks).

Objectives

This course should enable the students to –

1. Understand the concept of health from the individual and community perspective.
2. Know the importance of epidemiology and demography in health.
3. Assess the health and nutritional status, and analyse the situation.
4. Know the factors affecting health and nutritional status of individuals and community.

Content-

UNIT I

1. **Health and Dimensions of Health**
   Positive health versus absence of disease.
2. **Community and its Organization**
   Concept of community, types of community, factors affecting health of the community – environmental, social, cultural, dietary, organizational, economic, political. Vulnerable groups/ needs of special populations.
3. **Public Health, Demography and Epidemiology**
   Demography and its applications. Epidemiology – study of the epidemiologic approach – time distribution, place, person, determinants of disease, preventive and social means. Community health through the lifespan. Vital Statistics and their significance.
4. **Epidemiological Methods**
   Descriptive, analytical, experimental, serological, clinical.

UNIT II

5. **Communicable and Infectious disease Control**
   Nature of communicable and infectious diseases, infection, contamination, disinfections, decontamination, Transmission – direct and indirect, vector borne disease, epidemiology 0f infection, infecting organisms and causative agents – their

microbiology, environmental measures and epidemiologic principles of disease control.

6. **Community Water and Waste Management**
   Importance of water to the community, etiology and effects of toxic agents, water borne infectious agents, sources of water, safe drinking water/potability and tests for solid waste and disposal, liquid waste disposal.
7. **Community Food Protection**
   - Epidemiology of food borne diseases
   - Modes of transmission, control measures and prevention, food
   - Protection and safety – objectives, process and outcome. Vector
   - Control, rodent control.

UNIT III

8. **Food Adulteration**
   Laws governing food standards. Significance – PFA, FPO, ISI, Agmark, Meat product Order, Codex Alimentarius. Common adulterants in food and their effects on health, common household methods to detect adulterants in food.
9. **Life Style and Community Health**
   Preventive and promotive aspects, public education and action, alcohol, cigarette smoking, drugs, AIDS, STD, diet and chronic diseases.
10. **Immunization**
    Importance and schedule for children, Adults and for foreign travel, problems encountered – importance of cold chain, role of individual, family and community in promoting health.

References

1. Smith, G.W. (1957): Preventive Medicine and Public Health, 2nd edition, Macmillan Co., New York.
2. Park, K. (1994): Park's Textbook of Preventive and Social medicine, 9th edition.M/s Banarasidas Bhanot. Jabalpur.
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4. Asten, G. Tiffney, J. (1981):Guide to improvingfood Hygiene. North World, London.
5. Saha, A. ,Shattock, F., Moustafa, T. (1989): Epidemiology in Primary Health Care. Interprint.
6. Mittal,S.K, Kukreja,S.(1983):Immunisation in Practice. Indian Academy of Pediatrics.
7. Beaglehole,R.,Bonita,R.,Kjellstrom,T. (1993): Basic epidemiology. World Health Organisation,Geneva.
8. Clark, J., Henderson, J. (1983): Community Health, Churchill Livingstone.

Paper 20

FOOD PROCESSING AND TECHNOLOGY

Hours/Week:5 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Note: Examiner is required to set the question paper of 40 marks only. Each question paper is divided into into three parts Part- A, Part B and Part C.

Part A: (8 marks) is compulsory and contains 8 questions (20 words each) at least 1 question from each unit. (Each question is of 1 mark).

Part B: (8 marks) is compulsory and contains 4 questions (50 words each) at least 1 question from each unit. (Each question is of 2 marks).

Part C: (24 marks) is compulsory and contains 6 questions (400 words each) candidate is required to attempt 3 questions one from each unit. (Each question is of 8 marks).

Objectives-

This course should enable students to-

1. Know the importance of food processing and the various methods used.
2. Understand the basic principles and other procedures used in food processing and preservation as well as storage of various food stuffs.
3. Be familiar with the technological developments in the field.

Content-

UNIT I

1. **Main food crops grown in the country-**
   Production, trends, economic and nutritional importance – cereals, pulses and legumes, nuts and oil seeds, fruits, vegetables, milk, meat, poultry, fish.
2. **Food and its preservation (home and community level including commercial operations)-**
   Nature of the harvested crops, source of food problems and deterioration, its relation to the composition of foods, needs and benefits of food processing and technology for food preservation.
3. **Fresh food storage -**
   Principles – plant product storage, animal product storage, storage of grains. Effect of storage conditions on quality.

UNIT II

4. **Traditional methods of processing cereals and pulses-**
   Products such as parboiled rice, rice flakes, puffed rice, chana etc.
5. **Use of heat for food processing and preservation-**
   a) **Canning** – principles and methodology, factors influencing heat resistance of spores, heat penetration into containers and contents, influence of canning on food quality, storage of canned foods.

b) **Pasteurization and applications**- effect of food quality, storage of pasteurized food, UHT – methodology and applications.

6. **Drying and dehydration-**
   Types of foods- traditional and new food products, home, community and commercial operations. Methods used and effect on food quality. Solar driers- applications and potential for community. Storage and deterioration of dehydrated food products.
7. **Use of low temperatures-**
   Refrigeration and freezing –methods, principles and applications. Preparation of foods for freezing. Influence on food components and structure. Problems with freezing and thawing of bulk foods. Shelf life of frozen foods.
8. **Food irradiation-** technology and application.
9. **Use of chemical preservatives.**

UNIT III

10. **Food concentrates and semi moist foods-**
    Types, principles and manufacture, use of various substances to preserve foods, applications at community level.
11. **Pickling, curing and fermentations-**
    Pickles, chutneys, ketchups, sauces. Principles and methods used for various products. Fermentation – types, products and methods used. Home and commercial operations.
12. **Processing of oilseeds-**
    Oil extraction methods. Refining and hydrogenation.
13. **Manufacture of fruit juices, squashes, fruit syrups, cordials-**
    High acid and high sugar products- common defects. Preservation of crystallized and glazed fruits.
14. **Nutritional implications of food processing-**
    Causes for loss of vitamins and minerals. Enrichment, restoration and Fortification.

References-

Salunkhe, D.K. (1947): Storage, processing and nutritional quality of fruits and vegetables, CRC Press. Ohio. Encyclopaedia of Food Technology, AVI Publication.

Girdhari Lal (1967): Preservation of Fruits and Vegetables, ICAR, New Delhi.

Desrosier, N.W., and Desrosier, J.N. (1977): The Technology of Food Preservation, AVI Publication Co. Connecticut.

Joslyn, M.A. and Heid, J.L. (1964): Food Processing Operations, their management, machines, materials and methods, AVI Publishing Co. Connecticut.

SEMESTER VI

Paper 21

NUTRITION AND HEALTH COMMUNICATION

Hours/Week:5 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Note: Examiner is required to set the question paper of 40 marks only. Each question paper is divided into into three parts Part- A, Part B and Part C.

Part A: (8 marks) is compulsory and contains 8 questions (20 words each) at least 1 question from each unit. (Each question is of 1 mark).

Part B: (8 marks) is compulsory and contains 4 questions (50 words each) at least 1 question from each unit. (Each question is of 2 marks).

Part C: (24 marks) is compulsory and contains 6 questions (400 words each) candidate is required to attempt 3 questions one from each unit. (Each question is of 8 marks).

Objectives

This course should enable the students to

1 .Understand thought diffusion processes of the individual and the community.

2. Know effective communication techniques/methods.

3 .Be able to plan and develop health/nutrition education ,communication messages and strategies.

4. Be able to communicate on various issues related to health and nutritional status of individuals and the community.

Content

UNIT I

1. Objectives, principles and scope of nutrition and health education and promotion.
2. The diffusion process – limitation and utility.
5. Two step rate of diffusion and exposure. Models at communication .Behaviouristic and cognitive theories.
3. Communication media used/useful in nutrition and Health education-
6. Role and relative importance of spoken word, interpersonal communication ,visual and audio visual aids. Mass media-print media, radio and recording, television, films, video, advertising, social marketing, folk media, satellite, multimedia.

UNIT II

7. Attitudes and opinions

Attitude change and principles of congruity, communication, public opinion and propaganda. Role of opinion leaders.

8. Determinants of communication effectiveness
   Age, sex, power/ status, educational levels of source and receiver, credibility, group norms, referent value, affiliation
9. Teaching methods formal and non formal-
   Individual, group and mass approach. Expository, discovery, participatory, evaluative, simulation Games, Brain storming. Selection, use advantages and limitations..

UNIT III

10. Development in India-rural and Urban

(1) Philosophy, strategies, achievements and problems with reference to 5-year plans and various Governmental and Non-Governmental schemes.
(2) Diversity in India's population. Concept of rural communication-role in rural development, relationship with development and development support communication.
(3) Communication in urban areas.
(4) Acceptability and credibility of communication in rural and urban environment.
(5) Role of opinion builders and opinion leaders. Barriers and accelerators in effective communication with reference to different communication media. selection , use , advantage and limitations.
   Communication and Social Development
   Education, health, Nutrition, Hygiene, Family planning, environment.

References

Willbur Schramm(1953): Process and Effects of Mass Commuy-Urbana,University of Illinois Press.
Lee Richardson (1962):Dimension of Communication-Appleton Century Crofts,NewYork.
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Eapen,K.E.:The media and development.
Rao,Y.V.L:Communication and Development.
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Dunn,S.W.,Barban,A.M.(1978):Advertising, it's Role in Modern Marketing, 4th Ed.
Joshi,P.C.(1992):Culture ,Communication and Social Change.
Shah.A.and Joshi,U.(1992):puppetry and Folk Dances for Non-formal Education, Sterling Publications.
Dahama,O.P. and Bhatnagar,O.P.(1991): Education and Communication for Development, Oxford and I.B.H.Publishing CO.Pvt.Ltd.
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Nutrition Education Series-UNESCO,Paris.
Manoff,R.K.(1985): Social Marketing, New Imperatives for Public Health,Praeger,New York.

Paper 21
NUTRITION AND HEALTH COMMUNICATION PRACTICALS

Hours/Week:5 **Max. Marks: 50**

Duration of Examination: 3 hrs Main Exam:40

Internal Assessment :10

Objectives

This course should enable the students to -

1.Develop insight into planning and organization of Nutrition and health education.

2. Develop ability to give nutrition and health education to specific target groups.

Be able to select appropriate communication media and strategies which are situation specific, need based and target group oriented.

Content

1.Use of visual media

Development of charts and posters for health and nutrition communication, flash cards and flip charts.

2.Demonstration as technique of communication

3.Use of other methods

Street play, role play, puppet show in nutrition and health communication.

4. Use of print media

Development of leaflets/booklets, Newspaper/magazine articles.

5. Use of media in social marketing

Campaign planning ,writing of appropriate message, use of appropriate media, writing and production of jingles.

6.Training of grass root level workers

Identifying issue/area which requires interventions using participatory training. Setting learner objectives, teaching objectives. Developing a training Module, conducting the training, evaluating the training.

Paper 22

FOOD QUALITY CONTROL

Hours/Week:5 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Note: Examiner is required to set the question paper of 40 marks only. Each question paper is divided into into three parts Part- A, Part B and Part C.

Part A: (8 marks) is compulsory and contains 8 questions (20 words each) at least 1 question from each unit. (Each question is of 1 mark).

Part B: (8 marks) is compulsory and contains 4 questions (50 words each) at least 1 question from each unit. (Each question is of 2 marks).

Part C: (24 marks) is compulsory and contains 6 questions (400 words each) candidate is required to attempt 3 questions one from each unit. (Each question is of 8 marks).

Objectives

This course will enable the student to-

- Know the importance of cost control and quality control.
- Be familiar with costing and pricing of recipes.
- Be familiar with cost reporting systems.
- Be aware of the Government regulations and Standards of food quality.
- Be familiar with the testing of various quality parameters.

Content

UNIT I

1: Importance of costing and cost control, methods of costing and costing
Methodology in Catering business, emphasis on batch costing.

2: Cost classification into materials, labour and overheads and their
Percentage analysis on net sales for clear understanding of their relatives Importance.

3: Material costing, use of standardised recipes, material's cost control
Through basic operating activities like purchasing, receiving, storage, issuing, Production, sales and accounting; yield analysis from time to time.

4: Control of labour costs and overheads, periodical
Percentage analysis, calculation of overhead allocation rates.

5: Cost behaviour into variables, fixed and semivariable and its
Impact on Unit cost.

6: Cost reporting system- daily, monthly and for special managerial Decisions.

UNIT II

7: Management accounting Ratio analysis-

- Importance, significance of accounting ratios and its limitations.
- Preparation of ratios, Simple workouts. (Simple workout shall be restricted to finding out ratios mentioned from the given final a/c).
- Profitability ratios GP, NP, OPERATING- material consumed, manufacturing expenses, administrative expenses, selling expenses.
- Performance or activity ratio INVENTORY TURNOVER, WORKING CAPITAL TURNOVER.
- Financial position judgement ratio CURRENT, LIQUIDITY, FIXED ASSETS CURRENTASSETS, DEBT-EQUITY.

8: Break-even analysis with simple workouts, (Basic workout mention of p/v ratio only theory knowledge).

9: Introduction to variance analysis- meaning and uses---price and quantity variances.

UNIT III

10: Internal check and Internal control.

11: Meaning and advantages- factors to be borne in mind while developing internal check/ control procedure.

12: Introduction to Quality Control, Evaluation and Assurance.

13: Responsibilities and Organization of the Quality Control Department

14: Samples, Inspection Sampling and Interpretation of data.

References

Bhar, B.K. (1977): Cost Accounting, Academic publishers, Calcutta.
Matz, A., Curry,O. and Frank, G.W. (1970): Cost Accounting, Taraporewala Sons & Co. Pvt. Ltd., Bombay.
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Boardmen, R.F.: Hotel and catering costing and budgets, Heinemenn, London.
Paige, G.(1979): Catering costs & control. Cassell, London.

Paper 22
FOOD QUALITY CONTROL

PRACTICAL

Hours/Week:5 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Content-

1: Cost Control-n Developing IC/C Procedures for materials-

- Purchasing, receiving, storing, issuing. Developing IC/C procedures for food and beverage department.
- Developing IC/C procedure for front office. Developing IC/C procedure for housekeeping.

2: Quality Control- Analysis and detection of adulterants in foods.

- Oils, Fats (Chemical and microbiological estimations.) Butter and Ghee. Cereal grains, flours and cereal products. Milk and milk products. Icecream, Cakes and Biscuits. Confectionery, Spices.

3: Detection of Food Additives- preservatives, Colours, Antioxidants, Pesticides, Flavours.

4: Shelf life studies (to be spread over a few weeks).

5: Tests used for Wrapping and Packaging Materials.

Paper 23

DIETETIC TECHNIQUES AND PATIENT COUNSELLING

Hours/Week:5 **Max. Marks: 50**
Duration of Examination: 3 hrs Main Exam:40
Internal Assessment :10

Note: Examiner is required to set the question paper of 40 marks only. Each question paper is divided into into three parts Part- A, Part B and Part C.

Part A: (8 marks) is compulsory and contains 8 questions (20 words each) at least 1 question from each unit. (Each question is of 1 mark).

Part B: (8 marks) is compulsory and contains 4 questions (50 words each) at least 1 question from each unit. (Each question is of 2 marks).

Part C: (24 marks) is compulsory and contains 6 questions (400 words each) candidate is required to attempt 3 questions one from each unit. (Each question is of 8 marks).

Objectives

This course should enable students to-

1. Critically appraise, plan and organize/supervise preparation and service of different kinds of therapeutic diets in hospital dietary service.
2. Develop skills for patient counselling.
3. Interact effectively with patients and their families and to give dietary advice in the context of patients' socio-cultural and economic milieu.

Content

UNIT I

1. Dieticians as part of the medical team and outreach services.
2. **Medical history assessment-** Techniques of obtaining relevant information for patient profiles.

UNIT II

3. **Dietary diagnosis and test for nutritional status**- Correlating clinical dietary information.
4. **Patient education and counselling**- Assessment of patient needs, establishing rapport, counselling relationship, resources and aids to counselling.

UNIT III

5. **Aesthetic attributes of diet**.
6. **Follow up visits and patients' education**.

References

1. ARA Health Care Nutrition Services Nutrition Counsellor: Strategies for results, controlling the pace of counselling (1988), Philadelphia ARA services.
2. Raab, C. and Tiloston, J. (eds) (1983): Heart to Heart- A manual on Nutrition counselling for the reduction of cardiovascular disease risk factors, U.S. Govt. Printing Office- Washington DC.
3. Journal of American Dietetics Association.

Paper 24

ENTREPRENEURSHIP MANAGEMENT

Hours/Week:5 **Max. Marks: 50**

Duration of Examination: 3 hrs Main Exam:40

Internal Assessment :10

Note: Examiner is required to set the question paper of 40 marks only. Each question paper is divided into into three parts Part- A, Part B and Part C.

Part A: (8 marks) is compulsory and contains 8 questions (20 words each) at least 1 question from each unit. (Each question is of 1 mark).

Part B: (8 marks) is compulsory and contains 4 questions (50 words each) at least 1 question from each unit. (Each question is of 2 marks).

Part C: (24 marks) is compulsory and contains 6 questions (400 words each) candidate is required to attempt 3 questions one from each unit. (Each question is of 8 marks).

Objectives

This course should enable students to-

1. Develop entrepreneurship skills.
2. Analyze the environment related to small scale industry and business.
3. Understand the process and procedure of setting up small enterprises.
4. Develop management skills for entrepreneurship development.

Content

UNIT I

1. **Entrepreneurship**
    - Definitions, need, scope and characteristics of entrepreneurship, entrepreneurship development and employment promotion.
    - Identification of opportunity.
2. **Business environment for the entrepreneur**
    - Government of Indian policy towards promotion of entrepreneurship. Exposure to demand based, resource based, service based, import substitute and export promotion industries.
3. **Need, Scope and approaches for project formulation.**
    - Market survey techniques, criteria for principles of product selection and development, choice of technology.
    - Major steps involved in setting up a small scale unit – project identification, project formulation, resources mobilisation.
    - Institutions, financing procedure and financial incentives.
    - Financial ratios and their significance. Books of accounts, financial statement, funds flow analysis.

UNIT II

4. Techno-economic feasibility of the project
5. Critical path method, Project Evaluation, Review Techniques- As planning tools for establishing SSI.
6. Plan layout & process planning for the product establishing the unit.

UNIT III

7. Creativity and innovation problem solving, personnel management, salaries, wages and incentives, performance appraisal, Quality Control.
8. **Marketing and Sales Management**
    - Marketing strategy, packaging, advertising, label intervention, pricing, after sales services.
9. **Legislations**
    - Licensing, registration, Municipal laws, business ethics, income tax, labour law application. Consumer complaint redressal.

References

1. Deshpande, M.V. (1984): Entrepreneurship of small scale industries, concept, Growth and Management, Deep and Deep Publication, D-1/24, R- Garden, New Delhi.
2. Meredith, G.G., Nelson, Re et al. (1982): Practice of Entrepreneurship, ILO Geneva
3. Parekh, U and Rao, T.V. (1978): Personal Efficacy in Developing Entrepreneurship, Learning System, New Delhi.
4. Rao, T.V. & Parekh, L.U. (1982): Developing Entrepreneurship, A Handbook, Learning Systems, New Delhi.
5. Enterpreneurship Development (1982): Institute of India. A Handbook for New Entrepreneurs, Enterpreneurship Development Institute of India.