

Teaching Module for Nutrition Hons.

Part I Examination

Paper I: Human physiology and general aspects of nutrition. (F.M.-50)

Part A:

1. Body composition:

- (a) Generalized structural make up of human body: 2L
- (b) Structure of animal cell : 2L
- (c) Function of animal cell : 1L
- (d) Plasma membrane structure: 2L
- (e) Fluid mosaic model : 2L
- (f) Nucleus, nuclear membrane : 2L
- (g) Nucleolus : 2L
- (h) Chromatin : 2L

15 L

2. Digestive system:

- (a) Anatomical consideration of GI tract : 2L
- (b) Histological arrangements of cell layers : 1L
- (c) The stomach : 2L
- (d) The small intestine : 2L
- (e) The large intestine : 1L
- (f) The liver and pancreas : 3L
- (g) Digestion and absorption of protein : 2L
- (h) Digestion and absorption of carbohydrate : 2L
- (i) Digestion and absorption of fats : 2L

17L

3. Cardiovascular system:

- (a) Blood and its composition : 4L
- (b) Blood group and blood transfusion : 2L
- (c) Structure and function of heart : 3L
- (d) Cardiac cycle and cardiac output : 2L
- (e) Blood pressure and its regulation : 2L
- (f) Blood coagulation : 2L

15L

4. Respiratory system:

- Structure of lungs : 2L
- Gaseous exchange : 2L
- Acclimatization : 2L

6L

5. <u>Excretory system:</u>	
Structure of nephron	: 2L
Function of kidney	: 1L
Physiology of urine formation	: 3L
Structure and function of skin	: 2L

08L	
6. <u>Reproductive system:</u>	
Structure of testis	: 1L
Spermatogenesis	: 2L
Structure of ovary	: 2L
Oogenesis	: 2L
Menstrual cycle and its hormonal control	: 3L
Pregnancy and parturition	: 3L
Lactation and menopause	: 2L

15L	
7. <u>Nervous system:</u>	
Basic arrangement of nervous system	: 2L
Sympathetic nervous system	: 2L
Parasympathetic nervous system	: 2L
Brief anatomy of cerebrum, cerebellum, hypothalamus, reticular formation	: 4L
Neuromuscular junction	: 2L

12L	
8. <u>Musculoskeletal system:</u>	
General idea about muscles	: 2L
Theory of muscle contraction	: 2L
Bones and teeth	: 3L

07L	
9. <u>Endocrine system:</u>	
General arrangement of the endocrine system	: 1L
Structure and functions of pituitary, thyroid, Adrenal and pancreas	: 7L

08L	

Part B: General aspect of nutrition

1. <u>Concept and definition of terms</u>	
(a) Nutrition, malnutrition and health	2 L
(b) Scope of nutrition	1 L
2. <u>Minimum nutritional requirement and RDA</u>	
(a) Formulation of RDA, principle	2 L

(b) Dietary guideline, reference man and woman	1 L
3. <u>Energy in Human nutrition</u>	
(a) Energy and its unit, energy balance	1 L
(b) Assessment of energy requirement	1 L
(c) Determination of energy of food	1 L
(d) BMR and its regulation , SDA	2 L
4. <u>Nutrition during pregnancy and lactation</u>	
(a) Nutritional demands of pregnancy	3 L
(b) Food selection during pregnancy	2 L
(c) Complication of pregnancy	3 L
(d) Diet during lactation	2 L
5. <u>Nutrition during infancy</u>	
(a) Advantages of breast feeding	2 L
(b) Formula feeding	3 L
(c) Weaning, its types, objectives	2 L
(d) Supplementary food	1 L
(e) Nutritional management of preterm baby	2 L
(f) Difference between artificial milk and human milk	1 L
6. <u>Nutrition for growth</u>	
(a) Diet in childhood	2 L
(b) Elementary school age and its dietary requirement	3 L
(c) Importance of iron of adolescent girls	1 L
(d) Diet in high school age	3 L
7. <u>Nutrition for athletes</u>	
(a) Nutritional requirement	2 L
(b) Pregame meal , sports anemia , carbohydrate loading	1 L
(c) Meal planning	2 L
8. <u>Geriatric nutrition</u>	
(a) Nutrition for aged person	2 L
(b) Dietary modification for aged person	2 L
(c) Planning of meals for older people	1 L
(d) Antioxidants for prevention of aging	3 L

Paper II

Part A: Food Science and Bio-chemistry

1. (a) General Idea of Food, Classification of Food 1L
(b) Nutrient and their types, nutritional status, Food Guide Pyramid 2L
2. Carbohydrate:
 - (a) Definition and classes of carbohydrates (monosaccharides, oligosaccharides and polysaccharides) 2L
 - (b) Properties and dietary importance of carbohydrate (starch, sucrose, lactose, glucose and fructose) 2L
 - (c) Carbohydrate Metabolism
 - (i) Glycolysis: Definition, Reaction Step, Energetics and significance 2L
 - (ii) TCA Cycle: Definition, Reaction Step, Energetics and significance 2L
 - (iii) Neoglucogenesis: Definition, Formation of glucose from Lactate, Pyruvate, Glycerol and Amino acid 3L
 - (iv) Glycogenesis: Definition, Reaction Step, Significance 1L
 - (v) Glycogenolysis: Definition, Reaction Step, Significance 1L
3. Protein:
 - (a) Amino acid and classes of amino acid 2L
 - (b) Protein and classes of protein 2L
 - (c) Properties and function of protein 2L
 - (d) Protein metabolism:
 - (i) Deamination and transamination 2L
 - (ii) Urea cycle 2L
4. Lipids :
 - (a) Fatty acids and their classification 2L
 - (b) Lipid and Fat and their classification 2L
 - (c) Properties of fat and dietary importance of fat (triglycerides, phospholipids and cholesterol) 2L
 - (d) Lipid metabolism (B-oxidation of fatty acid) 2L
5. Enzyme:
 - (a) Definition and classification of enzyme 2L
 - (b) Definition and functions of co-enzyme 2L
 - (c) Properties and factors affecting enzyme 2L
6. Minerals and Vitamins:
 - (a) Dietary source, physiological role and deficiency diseases of Ca; Fe; Na & K; I & Zn; Mn, Mg, Co 5x2L
 - (b) Dietary source, physiological role and deficiency diseases of Vit A; VitD; VitE & K; Niacin & Pyridoxin; Folic acid & Vit B₁₂; Vit C 7x2L

7. <u>Dietary Fibre:</u>	
Definition and classification	2L
Nutritional significance	2L

PART B: FOOD COMMODITIES

1. CEREALS	
Introduction with different type of cereals. Rice & its type, processing, different product of rice. Wheat & its type, processing, different product, Oats & its product, use as breakfast cereals. Nutritional aspects of these cereals.	6L
2. PULSES & LEGUMES	
Introduction with different type of pulses. Discuss about their nutrient, Importance Of legumes in diet & their nutritional Aspects. Uses & storage of pulses & Legumes.	6L
3. MILK & MILK PRODUCTS	
Milk & its nutritional importance. Composition of different types of Milk. Types of processed milk. Processing of curd, paneer, butter & cheese. Nutrient composition of milk products.	6L
4. EGGS	
Structure & composition of egg. Nutrient of egg. Product made from egg. Use of egg in different food preparation. Nutritional importance of egg.	3L
5. FISH & MEAT	
Introduction with different type of edible fish & meat. Nutritional importance of different Fish & meat. Process of storage. Different Types of spoilage.	5L
6. VEGETABLES & FRUITS	
Introduction with common fruits & vegetables. Discussion about their product. Nutritional importance of these products.	5L
7. FATS & OILS	
Introduction with different type of edible fats & oils. Sources. Nutrient composition. Importance of fats & oils	3L
8. SALTS	
Introduction with different type of salts. Uses. Nutritional Importance.	2L
9. BEVERAGES	
Introduction with different beverages. Coffee, tea, wine preparation & Processing. Use of beverages. Nutritional importance of Beverages.	4L
10. FOOD ADJUNCTS	
Introduction with regular spices. Food colour, essence. Use, importance & nutrient value of Chilli, turmeric, garlic, ginger.	6L

11. PRESERVED PRODUCTS

Processing & preparation of jams, jellies, pickles, syrups Squashes. Nutritional importance & uses. 4L

12. FOOD ADULTERANTS

Idea of adulteration & adulterants. Health effects due to Adulteration. Household method of detection of adulterant in foods. 3L

13. FOOD STANDARDS

General idea about food processing & preservation. Idea about food standard agency-ISI, AGMARK, FPO, MPO, PFA. 3L

Part II Examination

Paper III

Part A : Diet therapy I (F.M. 50)

1. <u>General ideas of diet therapy:</u>	
Therapeutic adaptation of normal diet	: 3L
Classification of therapeutic diet	: 2L

	05L
2. <u>Hospital basic diet:</u>	
Nutritional adequacy of hospital diets	: 2L
Basic concept and methods of Oral feeding, Tube feeding, Parenteral feeding	: 6L

	08 L
3. <u>Energy modification and nutritional care for</u>	
Weight management	: 3L
Identifying the overweight and obese	: 2L
BMI	: 1L
Low energy diet	: 2L

	08 L
4. Diet for febrile conditions, infections and Surgical conditions	: 6L
5. Diseases of gastrointestinal tract and liver	
Diarrhoea, constipation, irritable bowel Syndrome, flatulence, peptic ulcer, ulcerative Colitis	: 12L
Viral hepatitis and cirrhosis of liver	: 5L

	17L
6. Etiology, symptoms, diagnostic tests and management of Malabsorption syndrome	: 3L
7. <u>Anaemia:</u>	
Pathogenesis and dietary management of Nutritional anaemia	: 5L
Thalassemia	: 3L
Acute blood loss anaemia	: 1L

	09L

Part B: Diet therapy II (F.M.50)

1. Diabetes mellitus (DM):
 - Definition, types and symptoms of DM : 2L
 - Diagnosis of DM and Glycemic index : 2L
 - Management of DM : 2L
 - Definition and types of Diabetes Insipidus : 2L
 - Symptoms, diagnosis and management of Diabetes insipidus : 2L

08 L
2. Diseases of the cardiovascular system :
 - Atherosclerosis: definition, symptoms, etiology and risk factors : 2L
 - Dietary management of cardiovascular disease : 2L
 - Definition of other heart diseases and Dietary care of Ischemic heart disease : 2L
 - Nutritional aspects of Hyperlipidemia : 2L
 - Definition, classification and risk factors Of hypertension : 2L
 - Dietary management of hypertension and Low sodium diet : 2L

12 L
3. Renal diseases:
 - Introduction, causes and therapeutic Diet for renal diseases : 2L
 - Glomerulonephritis : 2L
 - Uremia : 2L
 - Nephrotic syndrome : 2L
 - Renal failure : 2L
 - Renin-Angiotensin system : 2L

12L
4. Allergies:
 - Definition of allergy, allergen and Its sources : 2L
 - Causes and symptoms of allergy : 2L
 - Diagnosis of allergy and types of Allergy : 2L
 - Dietary management, elimination Diet and food selection : 2L

08L

5. Inborn errors of metabolism:
Lactose intolerance- definition,
Metabolic defects and management : 2L
Alkaptonuria-definition,
Metabolic defect and management : 2L
Phenylketonuria-definition
Metabolic defect and management : 2L

06 L

6. Diet survey:
Definition and types : 2L
Advantages and disadvantages of
Different methods of diet survey : 2L

04 L

Paper IV (Practical paper) F.M.100

Paper V (Food microbiology, community nutrition and epidemiology)

Part A: Food microbiology (F.M.50)

1. A brief history of Microbiology:
Micro-organisms (bacteria, moulds and yeasts):
Their structure and comparison : 2L
Role of microorganisms in food fermentation : 2L

04L
2. Disinfection and sterilization:
Primary sources of food contamination : 2L
Disinfection, disinfectant and other physical
Methods of control : 2L
Sterilization and the instrument used for it : 2L
Physical method of sterilization : 2L
Chemical methods of sterilization and
Disinfection : 2L

08L
3. Control of microorganisms in food:
Intrinsic parameters affecting growth of
Microorganisms : 2L
Extrinsic parameters affecting growth of
Microbes : 2L
Use of high and low temperature : 2L
Dehydration, freezing and freeze drying : 2L
Irradiation and use of preservatives : 2L

08L
4. Nutrition and culture of microorganisms:
Microbial nutrition and growth : 2L
Factors affecting microbial growth : 2L
Types of culture media : 2L
Methods of pure culture : 2L

08L
5. Role of microorganisms in the spoilage of food :
Cereal and cereal products : 2L
Fruits and vegetables : 2L
Fish and other sea food : 2L
Meat products
Meat spoilage in aerobic and anaerobic
Condition : 2L

08L

6. <u>Bacterial food infections and food poisoning:</u>	
Salmonellosis	: 2L
Shigellosis and Listeriosis	: 2L
Staphylococcal infection	: 2L
Botulism	: 2L

	08 L

Part B: (Community Nutrition and Epidemiology)

1. Concept of community	: 2L
Types of community	: 2L
Factors affecting the health of community (social, environmental, political, cultural And economical	: 6L

	10L
2. <u>Community water and its management:</u>	
Sources of water	: 1L
Safe drinking water	: 2L
Etiology and effects of toxic agents	: 3L
Purification of water in large and small Scale	: 3L
Water borne diseases (cholera and Amoebiasis)	: 2L
Sewage disposal and treatment	: 4L
3. Microbiological examination of milk and Water	: 2L
4. <u>Importance of sanitation and hygiene</u>	
In food	: 2L
Kitchen hygiene	: 2L
Food plant hygiene	: 2L

	08L
5. <u>Nutritional problems in community:</u>	
Malnutrition	: 2L
Deficiency of vitamin A	: 2L
Deficiency of vitamin D	: 2L

	06 L
6. <u>Principles of Epidemiology:</u>	
Concept of disease (endemic, epidemic, Pandemic)	: 2L
Communicable and non-communicable Disease, acute and chronic disease	: 3L

Zoonosis, epizootic, enzootic, vector Borne and nosocomial disease)	: 5L
Rate of disease in a population – Attack rate, morbidity rate, mortality rate	: 4L
Incidence and prevalence	: 2L
Nature of infectious disease	: 2L
Factors that influence the epidemiology Of a disease	: 2L

	20 L
7. Epidemiological methods :	
Descriptive studies	: 4L
Analytical studies	: 4L
Experimental studies	: 3L

	11 L

Paper VI

Part A: Nutritional assessment and Nutritional programme

1. Assessment of nutritional status and surveillance:
 - (a) Nutritional assessment of human groups 2 L
 - (b) Biochemical and biophysical methodology 2 L
 - (c) Identifying signs of PEM , vit A deficiency 3 L
 - (d) Vit B complex deficiency 3 L
 - (e) Vit D and vit C deficiency 2 L
 - (f) Iron and iodine deficiency 2 L
 - (g) Secondary sources of community health data 2 L

2. Role of international and national organization:
 - (a) WHO 2 L
 - (b) FAO , UNICEF 2 L
 - (c) CARE 1 L
 - (d) NIN 2 L
 - (e) CFTRI 2 L
 - (f) ICMR 2 L
 - (g) Nutritional surveillance and nutritional monitoring 2 L

3. Nutritional studies:
 - (a) Nutritional studies of children 2 L
 - (b) Nutritional education 2 L

4. Immunization:
 - (a) Immunization schedule for children 3 L
 - (b) Cold chain system, vaccine 2 L
 - (c) Immunization for foreign travelers 2 L

5. National Nutritional Intervention Programme to combat malnutrition:
 - (a) ICDS 3 L
 - (b) Mid day meal 3 L
 - (c) PHC 2 L
 - (d) Public distribution system 2 L

PAPER IV

PART B: NUTRIGENOMICS & NUTRITION MANAGEMENT

1. CONCEPT & APPLICATION OF NUTRIGENOMICS & NUTRITION MANAGEMENT
What is genome? Idea on DNA & RNA. DNA replication. Relation of nutrient with Gene. Nutrient sensors. Goals of nutrigenomics. Pharmacogenomics & its importance. Application. 6L

2. HEALTH INFORMATICS

Concept & uses.Application	2L
3. DATA BASE	
Nucleic acid data base-types & uses. Protein data base-types & uses. Nutrient data base-types & uses.	5L
4. BLAST	
Introduction with BLAST. Principle, features & types. Significance,similarity searching,multiple sequence alignment. Phylogenetic tree.	6L
5. HOSPITAL MANAGEMENT	
Types of dietitian, role of dietitian in hospital management.	2L
6. FOOD SERVICE MANAGEMENT	
Definition, principles & function, tools of management. Resources.	2L