

BIOCHEMISTRY AND HUMAN NUTRITION

Full Marks: (50+50)

A. Biochemistry

1. Biochemistry and its scope, composition of living matter, biophysical concepts of acid, pH, buffers, oxidation and reduction concepts.
2. Introductory cell biochemistry, Separation of sub cellular components and their biochemical functions, structure of membranes
3. Enzymes: General properties, coenzymes and cofactors, kinetic and mechanism of action, inhibitors and activators.
4. Carbohydrate metabolism: Glycolysis, oxidation, oxidative phosphorylation and elements of bioenergetics. Biosynthesis of starch and glycogen.
5. Lipid metabolism and biochemical functions of lipids. Oxidation of fatty acids. Biosynthesis of fatty acids and fats. Lipid metabolism and health.
6. Protein metabolism and biochemical functions. End product of protein metabolism. Intermediary metabolism of amino acids and urea cycle. Metabolism of essential and non- essential amino acids with reference to health.
7. In-borne errors of metabolism and enzyme deficiency diseases.
8. Nucleic acids: biochemical functions. Elementary notion of protein biosynthesis.
9. Mineral metabolism: Biochemical functions of minerals. Active transport and absorption, calcium, phosphorus and iron metabolism. 6
10. Biochemistry of plant & animal hormones -ethylene. Auxin and gibberellin.

Practicals:

1. Ninhydrin reaction with proteins.
2. Million's reaction with proteins
3. Separation of proteins from peptones by saturation with $(\text{NH}_4)_2 \text{SO}_4$
4. Determination of lysine
5. Qualitative analysis of carbohydrates.
6. Quantitative estimation of sugar.
7. Quantitative estimation of protein.
8. Quantitative determination of enzyme activity with salivary amylase.
9. Estimation of activity of papain, diastase, Phosphatase.

10. Study on the effect of pH and substrate concentration on enzymic activity.
11. Enzymes: 1) Isolation and purification 2) Kinetics 3) Quantitative assay
12. Determination of amino acids and proteins; 1) Chemical methods 2) paper - chromatography 3) Microbiological assay 4) Electrophoresis
13. Vitamins: Determination of at least two vitamins (Vitamin B₁, B₂, C, niacin, Vitamin A and carotene, by 1) chemical procedure 2) Microbiological assay

Human Nutrition:

11. Introduction: Historical development, definition terminology, nutrition & development
12. Nutritional physiology: Human body composition, parts and functions of the digestive and circulatory systems.
13. The Food: Nutrients & their functions, nutritional classification food, energy value of foods, energy and nutrients requirements and allowances, digestion absorption and metabolism of food groups, nutritional aspect of nutrients, nutritional quality of protein, food composition table and its uses.
14. Malnutrition and nutrient deficiency disorders.
Definition, form & types of malnutrition, protein energy malnutrition, endemic goiter, vitamin A deficiency disorder, nutritional anaemia, ricket & osteomalacia, beriberi, scurvy, pellagra etc.
15. Nutrition of infants, pre- school children, pregnant & lactating mother.
16. Nutrition of old people.
17. Diet: balanced diet & dietary standards.
18. Infant food, weaning food and supplementary foods.
19. Enrichment and fortification.
20. Food habit
21. Nutritional status: Definition and factors affecting the nutritional status. Assessment of nutritional status.
22. International organizational activities in the field of nutrition FAO, WHO, UNICEF, ADB

Practicals:

1. Feeding experiments, Determination of PER, NPU
2. Determination of energy value of food-Bomb calorimeter
3. Preparation of weaning food
4. Preparation of balanced diet

5. Nutrition survey: Anthropometric survey
6. Food consumption survey.

Text Books:

1. White, A and Hondler, F. Principle of Biochemistry Mc Graw Hill Kozakusta Ltd Kokya ,New Delhi 1978
2. Lehninger ,A.L Biochemistry, Work Publishing Inc New York 1975
3. J.L jain Fundamental of Biochemistry. S.Chand & Company Ltd 1992
4. Swaminathan M. Advance Text book on food and nutrition Vol-1 & 2 Printing & publishing Co.Ltd Mysore, India 1993
5. King F.S and Burgess, A. Nutrition for developing countries, ELBS with Oxford University Press, 1992
6. Sumati R. Mudambi and Raj Gopal M.V Fundamental of food and nutrition, Wiley Eastern Ltd.1993
7. Shubhangini A Joshi, Nutrition and Dietetics, Tata McGraw Publishing Co.Ltd 1992
8. Harfog A.P and Starerer W.A Mannual for Social Surveys and Food Habits and Consumption in developing Countries .Pudor Wagenonger 1985