



TRIPURA UNIVERSITY

(A Central University)

Suryamaninagar

SYLLABUS

OF

Human Physiology

(Hons.)

Semester- III

UNDERGRADUATE

HUMAN PHYSIOLOGY (HONOURS)

Semester 03

Paper 03

Total Marks — 100

THEORY (H3A)

Total Marks — 60

Unit VII: Metabolic Biochemistry and Molecular Respiration (30)

1. Enzymatic mechanism and regulation of Glycolysis, Glycogenolysis and TCA cycle, Energetics of Glycolysis and TCA cycle, Anapleurotic cycle.
2. Oxidation and biosynthesis of fatty acids, Energetics of β -oxidation, Ketone bodies formation- function and fate.
3. Deamination and Transamination, Catabolism of Amino acids- Phenylalanin, Tyrosine, S-containing amino acids and tryptophan.
4. Urea formation- mechanism and regulation.
5. Inborn errors of metabolism- Glycogen storage diusease, Phenylketunuria, Albinism.
6. Gluconeogenesis, Pentose Phosphate and Uronic acid Pathway- mechanism and significance.
7. Biosynthesis of Cholesterol: mechanism and significance.
8. Catabolism of Purine and Pyrimidine.
9. Organisation of Electron Transport Chain, Chemi-osmotic hypothesis, Uncouplers.
10. Mechanism of Oxidative Phosphorylation: F_0F_1 ATP-ase, Inhibitos.

Unit VIII: Digestive system & Nutrition (30)

1. Anatomy and histology of alimentary tract and digestive glands.
2. Composition, function, formation, mechanism of secretion, regulation of secretion of digestive juices, enterohepatic circulation of bile salts and bile pigments – their significance, role of bile in fat digestion and absorption.
3. Formation of HCL, cholelithiasis, concept of hyperacidity, achlorohydrria.
4. Digestion and absorption of carbohydrate, fats, proteins, vitamin B₁₂, iron, calcium and iodine.
5. Enteric nervous system, movements of alimentary canals, swallowing phenomenon- mechanism, defecation mechanism.

6. Disorders of digestive system, peptic ulcer, vomiting, constipation.
7. Vitamins- water and fat soluble vitamins-sources, daily requirements and function.
8. Chemical nature and structure of vitamins; biosynthesis of vitamin C, A and D.
9. Co-enzymatic role of vitamins in metabolism.
10. Vitamin deficiency symptoms and disorders; hyper-vitaminosis.
11. Bulk and trace elements and physiological roles of Na^+ , K^+ , Ca^{2+} , Mg^{2+} , Fe^{2+} , Zn^{2+} , Se^{2+} , Cu^{2+} , Iodine.
12. Calorific value of foods and determination by Bomb calorimeter, SDA of foods, RQ, their definition and physiological importance.
13. BMR, factors affecting BMR, determination by Benedict's Roth apparatus.
14. Nutritional importance and dietary requirements of carbohydrate, protein and fat. RDA- carbohydrates, protein, fats and other nutrients. Complete and incomplete proteins, biological value of proteins, essential amino acids and fatty acids.
15. Food groups, formulation of balanced diet for growing child, adult man and women, pregnant and lactating mother, elderly people.
16. Malnutrition, protein calorie malnutrition (Kwashiorkor) and undernutrition (marasmus), their preventive and curative measures, obesity.

Add on topics:

1. Cellular respiration and metabolism- relationship
2. Dietary time management- importance
3. Anthropometry- basic idea
4. Somatotyping- basic idea
5. Adolescence Growth
6. Xenobiotics

Suggested Readings:

- i. Concise text book of physiology – Indu Khurana; Arushi Khurana Text Book of Physiology – Prof. A. K. Jain
- ii. Essentials of Medical Physiology - Anil Baran Singha Mahapatra; G S Mahapatra
- iii. Ganong's Review of Medical Physiology- Kim E Barrett; Susan M Barman; Jason Yuan
- iv. Essentials of human nutrition- Mann and Turswell

PRACTICAL (H3B)

Total Marks — 40

A. Clinical Biochemistry

1. Qualitative identification of bio-chemical samples of physiological importance – HCl, Lactic acid, Uric acid, albumin, peptone, gelatin, Stach, dextrin, Glucose, Fructose, Maltose, Lactose, Sucrose, Urea, Bile Salt, acetone, Glycerol.
2. Estimation of serum cholesterol by Ferric chloride method.
3. Estimation of blood glucose by Folin-Wu method.
4. Estimation of serum/plasma protein by Biuret method.
5. Estimation of serum triglyceride by Nerl and Fringe method.
6. Estimation of serum SGPT/SGOT.

B. Nutritional Biochemistry

1. Colorimetric estimation of blood hemoglobin
2. Estimation of vitamin C in blood by 2,6-dichlorophenol indophenol method.
3. Estimation of lactose content of milk by Benedict's method.
4. Estimation of percentage quantity of carbohydrate in rice and potato.
5. Estimation of moisture content of food.

C. Assesment of Nutritional statusby Anthropometric and diet survey method (Compulsory).

Distribution of marks:

TOTAL MARKS: 40

Internal assessment: 08

Term and exam: 32

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| A. Clinical Biochemistry (any-one experiment): | 08 |
| B. Nutritional Biochemistry (any-one experiment): | 08 |
| C. Nutritional Status Survey Reports | 08 |
| a) Anthropometry | 04 |
| b) Diet Survey Report | 04 |
| D. Practical Note Book | 04 |
| E. Viva Voce | 04 |