TRIPURA UNIVERSITY

(A Central University)

Suryamaninagar

SYLLABUS

OF

Human Physiology

(General)

Semester- V

UNDERGRADUATE

HUMAN PHYSIOLOGY (GENERAL)

Semester 05 **Paper 05** **Total Marks — 100**

THEORY (P5A)

Total Marks — 50

Unit – XI: Nutrition and dietetics

1. Role of carbohydrates, fat, protein, vitamins and minerals in nutrition.
2. Nutritional requirements and formulation of balanced diet for adolescents and college students, workers with sedentary, moderate and heavy physical activity, pregnant and lactating women.
3. BMR- Definition and determination, controlling factors affecting and its significance.
4. Biological value of protein, RQ, SDA and RDA. Protein calorie malnutrition – definition, symptoms, classifications, major causative factors and remedial measure.
5. Vitamins – source, requirements, deficiency symptoms and functions.
6. Minerals and trace elements – iron, calcium and iodine: source, requirements, deficiency symptoms and physiological functions.
7. Diet survey- principle, significance.
8. Diets in diarrhoea, diabetes, goitre, obesity, hypertension.

Unit XII: Molecular biology and Immunology

1. Chemical nature of DNA and RNA.
2. DNA- the genetic material experimental evidences.
3. Semi conservative model of DNA replication – Meselson and Stahl's experiment. Concept of gene.
4. DNA replication in prokaryotes. Okazaki fragments.
5. DNA transcription in prokaryotes
6. Protein synthesis in prokaryotes, activation of amino acids, initiation, elongation, termination, role of A site, P site.
7. Cloning of DNA into cloning vectors.
8. Immune system, Innate and Acquired Immunity- their components.
9. Primary & secondary lymphoid organs, their functions.

10. Antigen, immunogen, epitope, hapten, paratope, MHC molecules, CDr, CD markers- general idea.
11. Humoral immunity- (a) General structure of IgG antibodies, physiological functions of each class of antibody molecules. (b) Complement system- classical pathway.
12. Primary and secondary immune responses, vaccination.
13. Clonal selection hypothesis of antibody production. Activation of B- cells by T- cells. Basic concepts of polyclonal and monoclonal antibodies.
14. Cell mediated immunity – role of cytotoxic T cell in cell mediated immunity, role of T-helper cell in activation of T- cytotoxic cell.
15. Basic principles of Enzyme Linked Immuno sorbent assay (ELISA), radioimmunoassay (RIA).

Add on topics:

i. Toxicology- general concept.

ii. T cell, B cell, Macrophages, Dendritic cells.

Suggested readings:

i. Text book of Physiology – Prof. A.K.Jain (7^{th} edition)
ii. Essential of human nutrition – Mann and Turswell (4^{th} edition)
iii. Biochemistry – U. Satyanarayan and U. Chakrapani
iv. Cell biology, Genetics, Molecular Biology, Evolution and Ecology- Dr. PS Verma ; Dr. VK Agarwal.
v. Roitt's Essential Immunology – Delvis, Martin, Burton, Roitt-Willy Blackwell

PRACTICAL (P5B)

Total Marks — 50

A. Biochemistry and nutrition:

1. Estimation of lactose content of milk.
2. Estimation of percentage quantity of carbohydrate in food.
3. Quantitative estimation of glucose and sucrose.
4. Ouster long double diffusion test (Ag-Ab reaction).
5. DNA electrophoresis – Demonstration.

B. **Assessment of Nutritional Status by Anthropometric and Diet Survey method**.

(Attendance in survey programme conducted by the department and submission of Diet survey report are compulsory pre-requisites for appearing Term – End Examination).

Marks distribution:

Total marks – 50
Internal assessment – 10
Term End Exam – 40

A. Biochemical/Nutritional experiment (any one experiment) : 15 [marks distribution for estimation: Principle -2 , Procedure – 2 , Calculation – 3, Result – 8. (Error : upto 5% : 08, upto 8% : 06, upto 10%: 04, upto 12% : 02, upto 14%: 01, above 14%: 00)]
B. Diet survey report – 10 (Attendance – 4, report – 6)
   Anthropometric measurements & interpretation of results – 5
C. PNB- 5
D. VIVA VOCE - 5