Syllabus Theory

B.Sc. VI Semester (Zoology) **Marks 70+30=100**

Subjact : Physiology and Biochemistry

Course Code- ZO(N)-302 **Credit: 3**

Block I. Physiology

Unit 1: Digestive System

Intracellular and extracellular digestion. Intestinal digestion - Pancreatic secretion, bile juices and digestion in small intestine, digestion and absorption in large intestine. Digestion and absorption of carbohydrate, fat and protein and regulation of enzyme action.

Unit 2: Respiration or Respiratory System

Types of respiration. Breathing mechanism, pulmonary ventilation, respiratory pigments, gaseous transport and respiratory quotient.

Unit 3: Blood Vascular System

Composition and functions of blood, Blood groups, Rh factor. Mechanism of blood clotting. Types of heart, Cardiac cycle and its regulation (Heart beat). Homeostasis. Blood pressure and ECG.

Unit 4: Excretory system

Structure of kidney. Mode of excretion of nitrogenous wastes in animals: ammonotelism, ureotelism, uricotelism and guanotelism.

Unit 5: Nervous system

Myelinated and non-myelinated nerve fibres. Neurotransmitters. Synapses: - Ultra structure and function. Resting and action potential of nerves, synapse and transmision of nerve impulse.

Unit 6: Muscular System

Ultra structure of smooth, striated and cardiac muscles. Muscle contraction and its machenism. Simple twitch and fatigue.

Block II. Endocrinology

Unit 7: Endocrine system : General characteristics of endocrine system. Structure and functions of Pituitary, Thyroid, Parthyroid, Pancreas, Adrenal, Testis and ovary in mammals. Mechanism of hormone action (cellular and sub cellular).

Unit 8: Hormonal dysfunction and diseases : Dwarfism, Gigantism, Acromegaly, Diabetes insipides and Diabetes mellitus, Goitre, Cretinism. Myxoderma and Addison's disease

Block III Biochemistry

Unit 9: Amino Acids and Peptides.
Bimolecular structure, classification and properties of peptide bond

Unit 10: Carbohydrates and Lipids

Definition, Classification, Metabolism: - Glucogenesis, Gluconeogenesis, Glycolysis, TCA. & oxidative phosphoration of Carbohydrates. Definition, classification, simple, compound and derived lipids. Source, significance & deficiencies diseases of Carbohydrates and Lipids.

Unit 11: Vitamins

Classification, structure, occurrence and functions of fat and water soluble vitamins. Source, significance & deficiencies diseases of vitamins.

Unit 12: Proteins

Definition, classification, structure and metabolism of proteins. Source, significance and deficiencies of Proteins.

Unit 13: Enzymes

Definition, properties, classification, mechanism of enzyme action and factors affecting enzyme action. Source, significance & deficiencies of Enzymes.

Suggested Readings:

Animal Physiology

1. William S.Hoar- General and Comparative Physiology, prentice hall of India ltd.
2. Wood E.W. Principle of Animal physiology
3. Nagbhushnum R.,Sarojini R., Kodarkar M.S. –Animal Physiology
4. Verma ,Agarwal & Tyagi-animal physiology
5. Moeye K.-Animal Physiology, Cambridge low prize edition.
6. Mohan Arora – animal physiology, Himalaya publication
7. A.K. Berry. –animal physiology
8. Singh. H.R.: An Introduction to Animal Physiology & related Biochemistry. S.I. Nagin Chand & Co.
9. Goel and Sastri : Animal Physiology, Rastogi Publications.
10. Rastogi. V.B. : Physiology and Endocrinology, Kedarnath Ramnath

Biochemistry and Endocrinology

1. J.L. Jain –biochemistry S.Chand Publication, Meerut
2. Lehninger- Biochemistry, Kalyani Publications
3. Granner and Rodwell - Harper's Illustrated Biochemistry, Murray, (27th Ed.), McGraw Hill, USA .
4. J H Wet - General Biochemistry Wiley Eastern Ltd.
5. C.B.Powar- Biochemistry – (Himalaya Pub.)

Syllabus Lab

B.Sc. VI Semester (Zoology) **Mark = 50**

Subjact : Physiology and Biochemistry : Lab
Course Code- ZO(N) 302L **Credit: 1**

Objectives:

1. To understand the blood physiology of the mammals i.e. hemoglobin % RBC & WBC, Haematin crystal and blood groups, Rh factor etc.
2. To study the various biochemistry exercises relevant to human beings i.e., Chemical test of urine for the presence of urea, sugar, proteins and ketone bodies and color test for carbohydrates, proteins and lipids

Syllabus

Measurement of action of salivary amylase, invertase enzyme and pepsin, trypsin. Blood physiology of the mammals i.e. hemoglobin % RBC & WBC, Haematin crystal and blood groups, Rh factor etc. Biochemistry exercises relevant to human beings i.e., Chemical test of urine for the presence of urea, sugar, proteins and ketone bodies and color test for carbohydrates, proteins and lipids.

Unit Details

Unit 1: Hematology Exercise
Unit 2: Physiology Experiment 2 (Slide study & reflex action)
Unit 3: Bio-chemistry Experiments

UNIT WISE CONTENT ZO(N) 302L

Unit 1: Hematology Exercise

1.1 Estimation of hemoglobin, % RBC & WBC and preparation of Haematin crystal.

1.2 Estimation of presence of sugar and albumin in a sample of human urine.

Unit 2: Physiology Experiment 2 (Slide study & reflex action)

2.1 Study of microscopic structure of endocrine glands: thyroid, pancreas, and ovary, testis, adrenal and pituitary

2.2 Study of estrous cycle in mice/rat.

Unit 3: Bio-chemistry Experiments

3.1 Chemical test of urine for the presence of urea, sugar, proteins and ketone bodies.
3.2 Color tests for carbohydrates, proteins and lipids
3.3 Action of Amylase on its respective substrates.