

VI SEMESTER B.Sc ZOOLOGY
PAPER VIII – ANIMAL PHYSIOLOGY AND TECHNIQUES IN BIOLOGY

UNIT I	40 hrs
ANIMAL PHYSIOLOGY	16 hrs
1.1 Digestion:	02 hrs
i. Neural-Hormonal control of digestive glandular secretion.	
ii. Symbiotic digestion in Ruminants.	
1.2 Circulation:	02 hrs
i. Respiratory pigments: Major types and their features.	
ii. Fuld and Spiro's theory of blood clotting.	
1.3 Respiration:	03 hrs
i. Regulation of respiration.	
ii. Transport of O ₂ and CO ₂ .	
iii. Oxygen dissociation curve: Definition and factors affecting the Oxygen dissociation curve (Oxygen, Carbon Dioxide, Temperature, pH, Body size and Organic phosphate compounds – Bohr effect and Haldane effect to be highlighted).	
1.4 Excretion:	02 hrs
i. Ammonotelism, Uricotelism and Ureotelism with examples.	
ii. Formation of Ammonia (Deamination of amino acids), Urea (Ornithine cycle) and Uric acid (Purine degradation)	
1.5 Muscle Physiology:	03 hrs
i. Ultrastructure of skeletal muscle.	
ii. Chemical composition of muscle.	
iii. Physico-chemical aspects of muscle contraction.	
iv. Sliding filament theory of muscle contraction.	
1.6 Neuro-Physiology:	02 hrs
i. Propagation and conduction of nerve impulse – Axonal and Synaptic.	
ii. Neuro-transmitters.	
1.7 Physiology of Sense organs:	02 hrs
i. Vision	
ii. Hearing	
UNIT II	15 hrs
2.1 Homeostatic functions:	
a. Endocrinology:	05 hrs
i. Chemical nature of hormones.	
ii. Endocrine glands: Pituitary, Thyroid, Parathyroid and Adrenal glands; secretions and their actions, effect of hyposecretion and hypersecretion.	
iii. Concept of neuro-secretion with examples.	03 hrs
b. Concept of Homeostasis and role of feedback mechanism:	
i. Positive – Oxytocin secretion.	
ii. Negative – Thyroid secretion (details of regulation required)	
c. Hormonal control of metamorphosis in Insects and Amphibians.	01 hrs
d. Osmoregulation:	02 hrs
i. Types of osmoregulatory mechanisms with examples.	
ii. Osmoregulation in migratory fishes.	
e. Thermoregulation in Homeotherms: Methods of heat loss and heat gain,	02 hrs

- Role of Hypothalamus in thermoregulation.
- 2.2 Common disorders in man: Renal failure and dialysis, Anaemia, Diabetes mellitus and Obesity. 02 hrs

UNIT III

TECHNIQUES IN BIOLOGY

- 09 hrs
- 3.1 Microtechnique: Introduction and procedure – fixation, embedding, microtomy, staining – simple and differential and mounting 01 hr
- 3.2 Immuno assay: Principle and applications. 01 hr
- 3.3 Separation techniques: Principle and applications of Centrifugation, Chromatography, Fractionation and Electrophoresis (Details of types and techniques to be avoided). 02 hrs
- 3.4 Autoradiography: Principle and applications 01 hr
- 3.5 Microscopy: 02 hrs
- a. Principle – magnification and resolution.
- b. Types: Light, Phase contrast, Fluorescent and Electron microscopy (TEM and SEM).
- 3.6 Micrometry: Principle and applications. 01 hr
- 3.7 Endoscopy: Principle and applications. 01 hr

References:-

1. Animal Microtechniques by Humason(1962)
2. Animal Cell culture a practical approach by R.W. Masters(2000)
3. Biostatistics by Khan and Khannum(1994).
4. Elements of Biostatistics by Prasad(2016)
5. Medical Physiology by Grabowski and Tortora(2003)
6. Animal Physiology by Hoar(1966)
7. Review of Medical Physiology by Ganong(2012)
8. Human Physiology by A.C. Guyton(2006)
9. Human Physiology Vol I & II by Chatterjee(2016)
10. Animal Physiology by Randol(2001).

**VI SEMESTER B.Sc., ZOOLOGY PRACTICAL
PAPER – VIII - ANIMAL PHYSIOLOGY AND
TECHNIQUES IN BIOLOGY**

- 15 Units**
08 Units
- I. Physiology Experiments:**
1. Qualitative analysis of Carbohydrates, Proteins and Lipids.
 2. Qualitative analysis of Nitrogenous wastes – Ammonia, Urea and Uric acid.
 3. Quantitative estimation of Oxygen consumption by fresh water Crab.
 4. Quantitative estimation of salt gain and salt loss by fresh water Crab.
 5. Detection of glucose, albumin and ketone bodies in urine.
 6. Qualitative analysis of digestive enzymes in human saliva.
 7. Estimation of muscle glycogen (Anthrocin method).
- 05 Units
- II. Techniques in Biology:**
1. Paper Chromatography for separation of amino acids and proteins.
 2. Demonstration of Rocket electrophoresis technique for detection of specific antigens.
 3. Scientific drawing of microscopic specimens using a prism type Camera Lucida.
 4. Differential counting of blood cells using haemocytometer
 5. Micrometry of cell types
- III. Project report on:** Dialysis, Diabetes mellitus, Obesity, Cardio vascular diseases and Anaemia.
02Units

**SCHEME OF PRACTICAL EXAMINATION
VI SEMESTER B.Sc ZOOLOGY
PAPER –VIII - ANIMAL PHYSIOLOGY AND TECHNIQUES IN
BIOLOGY PRACTICAL-VIII**

Duration: 3 hrs.	Max.Marks : 35
01. Physiology Experiment	12 marks
02. Techniques in Biology	08 marks
03. Project Report submission	05 marks
04. Viva-voce (On Project submitted) (Minimum of 3 – 4 questions)	05 marks
05. Class Records	05 marks
Total	35 marks

