PROPOSED CURRICULUM IN ZOOLOGY FOR B.Sc., (UG)
VI SEMESTER
PAPER VIII – ANIMAL PHYSIOLOGY AND TECHNIQUES IN BIOLOGY

-40 hrs.

Unit I – 13 hrs.

ANIMAL PHYSIOLOGY

Vegetative functions:

1.1. Digestion: - 02 hr

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. Transport of respiratory gases.
iii. Theories of blood clotting: Best and Taylor's theory, Fuld and Spiro's theory, and Howell's theory. Mechanism of blood clotting.

1.3. Respiration: -02 hrs

i. Regulation of respiration.
ii. Oxygen dissociation curves: Definition and factors affecting the Oxygen dissociation curve (Oxygen, Carbon Dioxide, Temperature and pH; Body size and Organic phosphate compounds – Bohr effect, Haldane effect and Root Effect to be highlighted).

1.4. Excretion: - 02 hrs

i. Introduction.
ii. Ammonotelism, Ureotelism and Uricotelism with examples.
iii. Formation of Ammonia (Deamination of amino acids), Urea (Ornithine cycle) and Uric acid (Purine degradation)

1.5. Energy metabolism: - 02 hrs

i. Metabolism and Metabolic rate.
ii. Basal metabolic rate (BMR)
iii. Measurement of metabolic rate: Methods – Calorimetry, Oxygen consumption method, amount of Carbon dioxide liberated, calculation of energy difference in food consumed and excreta.
iv. Factors affecting metabolic rate- Body size, Sex, Age, Disease, Food and Hormones.

1.6. 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.

Unit-II -14 hrs.

2.1. Physiology of Nerve: - 02 hrs.

i. Propagation and conduction of nerve impulse – Axonal and Synaptic.
ii. Neuro-transmitters.

2.2. Physiology of Sense organs: - 02 hrs

i. Vision
ii. Hearing
iii. Equilibrium
iv. Olfaction

2.3. Homeostatic functions:

a. Concept of Homeostasis and role of feed back mechanism- Positive – Oxytocin secretion and Negative – Thyroid, Parathyroid and Adrenal secretion (details of regulation required) - 02 hrs
b. Endocrinology: -03 hrs
   i. Introduction, Chemical nature of hormones.
   ii. Endocrine glands: secretions and their actions, effect of hyposecretion and hypersecretion.
   iii. Concept of neuro-secretion with examples.
   iv. Hormonal control of metamorphosis in Insects and Amphibians.
c. Osmoregulation: Introduction, Types of osmoregulatory mechanisms with examples, and osmoregulation in Migratory fishes. - 02 hrs.
d. Thermoregulation in Homeotherms: Methods of heat loss and heat gain, Role of Hypothalamus in thermoregulation. - 01 hr.

2.4. Common disorders in Humans: Jaundice, Hyperacidity, Peptic Ulcer, Hypertension, Anaemia, Diabetes mellitus and Obesity. -02 hrs.

Unit 3 – TECHNIQUES IN BIOLOGY - 13 hrs

3.1. Microtechnique: Introduction and procedure – fixation, embedding, microtomy, staining – simple and differential and mounting.
3.2. Immuno assay: Principle and applications.
3.3. Separation techniques: Principle and applications of Centrifugation, Chromatography, Fractionation and Electrophoresis (Details of types and techniques to be avoided).
3.4. Autoradiography: Principle and applications.
3.5. Microscopy: Principle – magnification and resolution. Types: Light, Phase contrast, Fluorescent and Electron microscopy (TEM and SEM).
3.6. Micrometry: Principle and applications.
3.7. Endoscopy: Principle and applications.
3.8. Kidney replacement therapy: Dialysis – Haemodialysis and Continuous ambulatory peritoneal dialysis.
3.9. Statistical tools and their applications – Mean, Median and Mode, Standard Deviation (SD), Regression, Correlation co-efficient and Probability.

VI SEMESTER B.Sc., ZOOLOGY PRACTICAL - 08
Physiology and Techniques in Biology

I. Physiology Experiments:

1. Qualitative analysis of Carbohydrates, Proteins and Lipids in Hen's egg.
2. Qualitative analysis of Nitrogenous wastes – Ammonia, Urea and Uric acid.
3. Effect of temperature on heart rate of Unio.
4. Quantitative estimation of Oxygen consumption by fresh water Crab.
5. Quantitative estimation of salt gain and salt loss by fresh water Crab.
6. Detection of glucose, albumin and ketone bodies in urine.
7. Osmotic relations in animals (E.g., Earthworm).
8. Qualitative analysis of digestive enzymes in the alimentary canal of Cockroach.
9. Estimation of Muscle glycogen (Anthrocin method).

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 : To draw microscope specimens using a prism type camera lucida.

III. Project report on: Dialysis, Diabetes mellitus, Obesity, Cardio vascular diseases and Anaemia.

SCHEME OF PRACTICAL EXAMINATION UNDER CBSS 2014-15 ONWARDS
B.Sc. VI SEMESTER ZOOLOGY

PHYSIOLOGY AND TECHNIQUES IN BIOLOGY – PRACTICAL - VIII

Duration: 3 hrs. Max.Marks : 35

01	Physiology Experiment	13 marks
02	Biological Techniques*	10 marks
03	Project Report submission	07 marks
04	Class Records	05 marks
	Total	35 marls
	Note:* i) Differential counting of blood cells using haemocytometer ii) Micrometry of cell types iii) Paper chromatography for separation of amino acids and proteins iv) Scientific drawing :- using Camera Lucida	