

FOURTH SEMESTER THEORY**Z.4. PHYSIOLOGY AND BIOCHEMISTRY****64 hours**

Code : **Z-4**

Univ Code :

Contact Hours :64

Work load : 4 hours per week

Credit Points :

Evaluation: Continuous Internal Assessment - 30 marks
 Semester and Examination - 70 marks

6 hrs

1. Physiology of Digestion

- Definition of digestion and types of digestion - mechanical and chemical.
- Digestion of carbohydrates, proteins and lipids.
- Absorption and assimilation of digested food materials.
- Gastrointestinal hormones.

-6hrs

2. Physiology of respiration

- Types of Respiration - external and internal respiration.
- Structure of mammalian lungs and gaseous exchange.
- Transport of O₂ - formation of oxyhaemoglobin and affinity of haemoglobin for oxygen dissociation curves.
- Transport of CO₂ -Chloride shift, Bohr effect.

3. Physiology of Circulation

- Open and closed circulation.
- Structure of mammalian heart and its working mechanism-Heartbeat and cardiac cycle. Myogenic and neurogenic hearts.
- Origin and conduction of heartbeat.

-6hrs**4. Physiology of Excretion**

- Definition of excretion.
- Forms of nitrogenous waste materials and their formation; classification of animals on the basis of excretory products.
- Structure of Nephron and physiology of urine formation.

-6 hrs**5. Physiology of Muscle contraction**

- General structure and types of muscles.
- Ultra structure of skeletal muscle. Muscle proteins.
- Sliding filament mechanism of muscle contraction.
- Chemical changes during muscle contraction- role of calcium, ATP utilization and its replenishment.

6 Hrs**6. Physiology of Nerve impulse**

- Structure of nerve cell.(multipolar nerve cell)
- Nature of nerve impulse - definition, physiology and conduction of nerve impulse. Resting potential and action potential
- Properties of nerve impulse-threshold value, refractory period, all or none response.
- Conduction of nerve impulse along an axon-local circuit theory and salutatory conduction theory.
- Structure of synapse, mechanism of synaptic transmission-electrical and chemical transmission. Neurotransmitters.

6 Hrs

7. Physiology of Endocrine system**-6hrs**

- Relationship between hypothalamus and pituitary gland.
- Hormones of Hypothalamus.
- Hormones of adenohypophysis and Neurohypophysis.
- Hormones of thyroid gland, parathyroid, adrenal and pancreas.
- Endocrine control of mammalian reproduction - Male and female hormones. Placenta

BIO -CHEMISTRY**1. Bio molecules : Concept of Micromolecules , macromolecules.****5 Hrs**

- ◆ Introduction, classification and functions of Carbohydrates, proteins and lipids.

2. Enzymes:**5 Hrs**

- ◆ Classification and properties
- ◆ Enzyme specificity
- ◆ Mechanism of Enzyme action (Lock & key)
- ◆ Factors affecting enzyme activity-enzyme concentration, substrate concentration, pH, temperature, activators and inhibitors of enzymes, holoenzyme, apoenzyme, prosthetic group, coenzyme, , co-factors, clinical significance of enzymes.

3. Vitamins**5 Hrs**

- ◆ Introduction , study with reference to occurrence, chemical nature, function and deficiency of vitamins. Classification of vitamins :Fat soluble vitamins - A,D,E,K; water soluble vitamins-B1,B2,B6,B12,nicotinic acid, folic acid, lipolic acid, biotin, pantothenic acid, ascorbic acid.

4 Bio-energetics-Glycolysis, Kreb's cycle and ETS**6 Hrs****Reference**

1. Animal Physiology : P.S. Verma. & V.K. Agarwal
2. Animal Physiology : P.K. Saxena.
3. Animal Physiology : A.K. Berry.
4. Essentials of animal physiology : S.C. Rastogi.
5. Animal Physiology : Roger Eckert and David Randall.
6. Fundamentals of Bio chemistry : J.L. Jain, Sanjay jain, Nitin Jain.
7. Principles of Biochemistry: Lehninger, David L. Nelson, Michael M. Cox.

PRACTICAL - ZP - 4**BASED ON PAPER Z -4:****PHYSIOLOGY AND BIOCHEMISTRY**

1. Qualitative tests for the detection of carbohydrates, (glucose - Biuret Test benedicts and fehlings tests
2. Starch- iodine), proteins (xanthoprotein) & fats (sudan-3) in the given sample
3. Qualitative tests for detection of nitrogenous excretory wastes in given sample
4. (For ammonia – nessler's reagent). For uric acid – (folins reagent) (+ saturated sodium carbonate/ benedicts uric acid reagent)
5. Detection of abnormal excretion of sugar (glucose) and albumin in human urine
6. Blood smear preparations , staining and study of human blood
7. Differential count (DC) of white blood corpuscles (WBCs) of human blood using the human blood smear slides
8. Total count (TC) of white blood corpuscles of human blood
9. Total count (TC) of red blood corpuscles of human blood
10. Estimation of hemoglobin content in human blood (Sahils method)
11. Preparation of hematin crystal from human blood
12. Determination of bleeding and clotting time of human blood
13. Salivary amylase activity test of human saliva
14. Osmotic haemolysis in animal cells (RBCs of blood of frog or human)
[*blood samples - students should use individual disposable needles for drawing their own blood]

FOR FORMAT OF QUESTION PAPER**PRACTICAL- ZP - 4;****PHYSIOLOGY AND BIOCHEMISTRY**

Q.1	Qualitative test for carbohydrates, proteins and fats.	05
Q.2	Detection of normal/ abnormal constituents of urine.	05
Q.3	Preparation of blood smear slides and counts for DC/ TC of RB/WBC.	10
Q.4	Estimation of hemoglobin /preparation of hematin crystals in human blood.	05
Q.5	Project work	05
Q.6	Record book	05
Q.7	Viva voce	05

OPEN ELECTIVE SUBJECTS FOR ZOOLOGY, V.S.K UNIVERSITY, BALLARI

IV semester Syllabus		40 hrs
Unit-1:		10 hrs
	<ul style="list-style-type: none"> • Dairy farming: Scope and importance of dairy. • Classification of breed – Mulching, draught and dual purpose breeds. • Breeds of cows (indigenous and exotic breeds) and Buffaloes. 	
Unit -2:		10 hrs
	<ul style="list-style-type: none"> • Chemical composition and importance of milk. <ul style="list-style-type: none"> • Byproducts of milk: - curd, ghee, butter, butter milk, cheese, khova, ice cream and yogurt. • Breeding techniques :- IVF, ET, MOET and artificial insemination. 	
Unit -3:		10 hrs
	<ul style="list-style-type: none"> • Differences between indigeneous and exotic breeds of cattles. • Importance of dairy. 	
Unit -4:		10 hrs
	<ul style="list-style-type: none"> • Processing , preservation and marketing of milk. 	

REFERENCES

- 1.Reproductionin farm animals – Hafez.E.S.E-(1962) Lea and Fibiger publisher.
- 2.Economic Zoology- Upadhyaya.
- 3.Economic Zoology-M.K.Publications.
- 4.Live stock and poultry production – Harbnas Singh and Earl.N.More- Prantice Hall of India.
- 5.