DEPARTMENT OF ZOOLOGY
D.D.U.GORAKHPUR UNIVERSITY
GORAKHPUR
SYLLABUS FOR THREE YEARS DEGREE COURSE
B.Sc. PART-I

The examination shall comprise three theory papers and a practical test.

Paper I : Lower non-chordata……45 marks
Paper II: Higher non-chordata……..45 marks
Paper III: Elements of cell biology, evolution and ecology…….65 marks
Total: 200 marks

Candidates must obtain minimum pass marks in theory and practical examinations separately.

PAPER-I – LOWER NON –CHORDATA (PROTOZOA – HELMINTHES)

General survey and outline classification (upto orders only) of Protozoa, Porifera Coelenterata, Platyhelminthes and Nemathelminthes, and the classification, habits, structure and Life-history of the representatives mentioned below.

PROTOZOA:

Entamoeba; Euglena; Paramecium; Monocystis.

Protozoa and diseases.

PORIFORA:

Sycon.

COELENTERATA:

Oblia; Aurelia.

PLATYHELMINTHES

Planaria; Fasciola Taenia.

NEMATHELMINTHES:

Wuchereria bancrofti.

Helminthes and diseases.

PAPER II ; HIGHER NON – CHORDATA (ANNELIDA – ECHINODERMATA)

General survey and outline classification (upto orders only) of Annelida, Arthropoda, Mollusca and Echinodermata, and the classification, habits, structure and Life-history of the representatives mentioned below.

ANNELIDA:

Nereis; Hirudinaria.

ARTHROPODA:

Palaemon; Grasshopper; Scorpion.

Useful and harmful insects.

MOLLUSCA:

Lamellidens.; Pila.

ECHINODERMATA:

Star- Fish.

PAPER III : ELEMENTS OF CELL BIOLOGY, EVOLUTION AND ECOLOGY

CELL BIOLOGY SECTON – A

Ultrastructure and molecular organization of cell- components in relation to basic functions; Structure and types of chromosomes; Mitosis and meiosis; Mendel's Laws of inheritance; Linkage and crossing over; Principles of chromosomal mapping.

SECTION –B

EVOLUTION:

Theories and evidinces of evolution; Lamarckism Neolamarckism, Darwinism, Neo Darwinism, Mutation theory, Modern Synthetic theory and evidences of evolution.

ECOLOGY:

Concept of ecosystem; Energy flow, abiotic ecofactor (temperature,light and moisture) and biotic (food- web as in fresh water lakes and ponds)primary ecological divisions and their fauna.

Zoogeographicals realms and their characteristics vertebrate fauna.

PART- II

The examination shall comprise three theory papers and a practicaetest.

Paper I : Protochordata,histology and embryology……45 marks
Paper II: Vertebrate zoology……..45 marks
Paper III: Elements of physiology and biochemistry ……45 marks
Practical: ……65marks
Total :200 marks

Candidates must obtain minimum pass marks in theory and practical separately.

Paper :I PROTOCHORDATA,HISTOLOGY AND EMBRYOLOGY

PROTOCHORDATA:

General survey and outline classification(up to orders only)of Protochordata,and the classification,habits,structure and life-history of the representatives mentioned below.

Urochordata:Herdmania.

Cephalochordata: Amphioxus.

HISTOLOGY:

Histology of stomach, intestine, liver,pancrease,bone,pituitary,Kidney, and gonads of frog and a mammal.

EMBRYOLOGY:

Outlines of developments of an ascidian,Amphioxus,frog and chick .Development of placenta in rabbit.

PAPER II: VERTEBRATE ZOOLOGY

General survey and outline classification (upto orders only) of Craniata, and the classification, habits, structure and Life-history of the representatives mentioned below.

CYCLOSTOMATA:

External features only.

PISCES

Scoliodon.

AMPHIBIA:

Parental care and neoteny.

REPTILIA:

Uromastix or any other Lizard.

Identification of poisonous and non-poisonous snakes.

Biting mechanism of snakes.

Snake venom and antivenin.

AVES:

Columba.

MAMMALIA:

Osteology of rabit.

Adaptive radiation.

General characteristics and affinities of Prototheria, Metatheria and Eutheria.

PAPER III : ELEMENTS OF PHYSIOLOGY AND BIOCHEMISTRY

SECTION-A

ELEMENTARY MAMMALIAN PHYSIOLOGY:

Elementary knowledge of digestion and absorption, respiration, circulation and blood, excretion, nerve conduction, muscles, endocrines and pheromones.

SECTION-B

BIOCHEMISTRY:

Elementary knowledge of functional groups (alcohols, thio-alcohols,acids aldehydes, ketones, and amines) and their reaction; Hydrogen ion concentration and buffering mechanism; Classification of carbohydrates; Characteristics of monosaccharides; Chemical classification of amino acids; Peptide Linkage; Types of Lipids; Hydrolysis of fats; Types of enzymes; Conditions for enzymatic activity; Types of vitamins and micronutrients.

PART-III

The examination shall comprise four theory Papers and a Practical test.

Paper I : Environmental biology and toxicology……..50marks
Paper II : Economic Zoology and elementary biostatistics.50marks
Paper III : Regulatory mechanism in vertebrates……50marks
Paper IV: Cell physiology and elements of ……..50marks
Biotechnology.
Practical : ……100marks
Total..300marks

Candidates must obtain minimum Pass marks in theory and practical separately.

PAPER I : ENVIRONMENTAL BIOLOGY AND TOXICOLOGY

SECTION-A

ENVIRONMENTAL BIOLOGY:

Ecosystem: General organization; Trophic structure; Energy flow; Ecological Pyramids; Basic types of biogeochemical cycles (chiefly nitrogen, phosphorus and sulphur).

Community: Basic structure; Species diversity, dominance, distribution and succession.

Population: Interspecific and intraspecific relations.

Population in relation to public health.

Conservation of natural resources with particular reference to wild Life conservation in India (chief endangered species and concept of wild Life reserves).

SECTION-B

ENVIRONMENTAL TOXICOLOGY:

Introduction and scope of toxicology. Survey of environmental toxicants and their biological and ecological ill-effects.

Dose-response relationship: Graded, quantal and cumulative responses. Outline of toxicological testing methods: Mortality tests (LC50/LD50 and safety margins/ Limits); Acute, subacute and chronic testing of local and systemic effects (Skin; Eye; Behavioural;

Biochemical; Physiological; Histopathological; Haematological; Reproductive; Teratogenic; Carcinogenic).

Translocation of chemicals: Membrane barriers; Storage depots; Biotransformation sites; Mixed multifunction oxidases.

Selective toxicity in relation to translocation and biotransformation factors.

Outline of antidotal procedures.

PAPER II: ECONOMIC ZOOLOGY AND ELEMENTARY BIOSTATISTICS

SECTION-A

ECONOMIC ZOOLOGY:

General Survey of economically important Phytoparasitic nematodes and insects.

Pathology/damage caused, Prevention and control of Leishmania, Trypanosoma, Heterodera and Tribolium.

Diseases transmitted and control of mosquitoes and housefly.

General features, Life-history and useful products of Apis, Bombyx and Tachardia.

Brief outline of fish-culture, poultry and dairy-farming.

Economic importance of fishes.

General survey of important food-fishes and their diseases,

Rat menace and its control.

SECTION-B

BIOSTATISTICS:

Graphic representation of frequency distribution: Histograms; Frequency polygon; Cumulative frequency graph/ogive.

Measurement of central tendency: Mean; Median; Mode.

Measures of variability: Standard deviation.

Normal probability curve: Basic features.

PAPER III: REGULOTRY MECHANISMS IN VERTEBRATES

Nutritional Physiology: Nutritive requirements (concept of balanced diet); Regulation of hunger; Satiety; Food movement; Secretion of digestive juices.

Respiration: Regulation of breathing and transport of gases.

Automobile Industrial emissions foodadditives Pesticides (Insecticides & Rodenticides) Heavy metals radioactive substances.

Blood and circulation: Regulation of heartbeat; Vasomotor control; Hemodynamics (Physical characteristics of blood with reference to haematocrit and viscocity; Blood flow and resistance; Fluid energies; Blood pressure; Blood volume; Cardiac output).

Excretion and osmoregulation: Regulation of kidney function; Cellular Permeability, diffusion and active transport; Salt and water balance.

Muscular system: Innervation of muscles, excitation and contraction coupling; Chemical basis of muscle contraction.

Nervous system: Role of autonomic nervous system in regulatory mechanism.

Endocrines: Hypothalamo-hypophysial system; Regulatory action of hormones at cellular Level; Thermoregulation in homeotherms.

PAPER IV: CELL PHYSIOLOGY AND ELEMENTS OF BIOTECHNOLOGY

SECTION-A

CELL PHYSIOLOGY:

Glycolysis; Kreb's cycle; Electron transport system; Synthesis of nucleic acids; Protein synthesis and its regulation; Immune responses.

SECTION-B

BIOTECHNOLOGY:

Basics of recombinant D.N.A. technology.

Biotechnological Processes: Cellular interaction and Production of hybrids; Nuclear cloning.

Elementary Knowledge of genetic engineering and its application towards human welfare.