

PERIYAR UNIVERSITY

SALEM - 636 011



M.SC. ZOOLOGY

REGULATIONS

(Effective from the Academic Year 2008 - 2009 onwards)

PERIYAR UNIVERSITY – SALEM – 636 011

BRANCH – VI - M.SC. ZOOLOGY

COURSE STRUCTURE UNDER CHOICE BASED CREDIT SYSTEM

(For the students admitted from the year 2008-2009 onwards)

Semester	Course	Course Code	Name of the Course	Hrs/W		Credit	Exam hrs	Marks		
				L	P			IA	EA	Total
I (Revised)	Core I	08PZO01	Functional Morphology of Invertebrates and Chordates	5	0	3	3	25	75	100
	Core II	08PZO02	Cell and Molecular Biology and Biophysics	5	0	3	3	25	75	100
	Core III	08PZO03	Advanced Genetics	5	0	3	3	25	75	100
	Core IV	08PZO04	Basic Concepts of Microbiology and Immunology	5	0	3	3	25	75	100
	Core Practical I	08PZOP01	Functional Morphology of Invertebrates and Chordates, Cell and Molecular Biology and Biophysics, Advanced Genetics and Microbiology and Immunology	0	4	5	4	40	60	100
	Elective I	08PZOZ01	First Aid and Home Nursing	6		4	3	25	75	100
			Total	26	4	21				600

Semester	Course	Course Code	Name of the Course	Hrs/W		Credit	Exam hrs	Marks		
				L	P			CIA	EA	Total
II	Core V	08PZO05	Biostatistics and Computer Applications	5	0	3	3	25	75	100
	Core VI	08PZO06	Biochemistry	5	0	3	3	25	75	100
	Core VII	08PZO07	Environmental Science	5	0	3	3	25	75	100
	Core Practical II	08PZOP02	Biostatistics and Computer Applications, Biochemistry and Environmental Science	0	4	5	4	40	60	100
	Elective II	08PZOZ02	Nutrition and Dietetics	5	0	4	3	25	75	100
	Common Paper	08PHR01	Human Rights (Common Syllabus)	2	0	2	3	25	75	100
	Choice based EDC	08PZOED1 08PZOED2 08PZOED3	<u>Choose any one of the following</u> Sericulture Fishery Biology and Aquaculture Poultry Farming	4	0	4	3	25	75	100
			Total	26	4	24				700

Semester	Course	Course Code	Name of the Course	Hrs/W		Credit	Exam Hrs	Marks		
				L	P			CIA	EA	Total
III	Core VIII	08PZO08	Developmental Biology	5	0	3	3	25	75	100
	Core IX	08PZO09	Basic Concepts of Biotechnology	5	0	3	3	25	75	100
	Core X	08PZO10	Animal Physiology	5	0	3	3	25	75	100
	Core XI	08PZOP11	Optional Subject – I - Applied and Storage Entomology	5	0	3	3	25	75	100
	Core Practical III	08PZOP03	Developmental Biology, Basic Concepts of Biotechnology, Animal Physiology and Optional Subject – I - Applied and Storage Entomology	0	4	5	4	40	60	100
	Elective III	08PZOZ03	Acquired Immuno Deficiency Syndrome (AIDS) and Awareness	6	0	4	3	25	75	100
			Total	26	4	21				600

Semester	Course	Course Code	Name of the Course	Hrs/W		Credit	Exam hrs	Marks		
				L	P			CIA	EA	Total
IV	Core XII	08PZO12	Evolution and Taxonomy	5	0	3	3	25	75	100
	Core XIII	08PZO13	Medical Laboratory Techniques	5	0	3	3	25	75	100
	Core XIV	08PZO14	Optional Subject – II - Sericulture	5	0	3	3	25	75	100
	Core Practical IV	08PZOP04	Evolution and Taxonomy, Medical Laboratory Techniques, Optional Subject - II - Sericulture and Microtechnique	0	4	5	4	40	60	100
	Core Dissertation	08PZODT	Dissertation – Review Report Evaluation Viva voce	0	5	6	-	-	-	200
	Elective IV	08PZOZ04	Economic Zoology	6	0	4	3	25	75	100
			Total	21	9	24				700
			Grand Total	99	21	90				2600

PERIYAR UNIVERSITY, SALEM - 11**M.SC. BRANCH - VI - ZOOLOGY**

(Effective from the academic year 2008 – 2009 onwards)

FIRST SEMESTER**CORE - I - FUNCTIONAL MORPHOLOGY OF INVERTEBRATES AND
CHORDATES****REVISED SYLLABUS**

Subject Code : 08PZO01

Hours : L+T+P=C

Mark : 100

5 +0+0=3

Unit – I : Protozoans and Parazoans

Broad classification of Animal Kingdom – Principles involved. Nutrition, reproduction and respiration in protozoa. Origin and evolution of metazoa – Theories. Symmetry and its significance in animal organization. Porifera – Canal system – Deep sea sponges.

Unit – II : Radiates and Acoelomates

Coelenterate – Different classes – Reproduction, digestion and nervous system in coelenterates. Ctenophore – Structural peculiarities and affinities. Platyhelminthes – Classes – Functional morphology and adaptive biology for parasitic mode of life.

Unit – III : Pseudocoelomates and Eucoelomates

Aschelminthes – Reproductive biology. Annelida – Archiannelida, morphological features. Arthropoda – Phylogeny of arthropoda, xiphosuran – Structure and affinities. Mollusca – Functional Morphology – Phylogeny. Echinodermata phylogeny and evolution – Coelom and coelomocytes, water vascular system.

Unit – IV : Pisces and Tetrapods – I

Classification of chordates – Origin and evolution of elasmobranchs – Adaptive radiation of elasmobranchs and bony fishes – Migration in fishes – Origin and evolution of Amphibia – Adaptive radiation in Amphibia – Terrestrialization.

Unit – V : Tetrapods – II

Reptiles – Evolution of the reptiles – Aves – origin and evolution of bird – Connecting links between reptiles and birds – Mammals. Structural peculiarities of prototheria, metatheria and eutheria. Comparative anatomy – integumentary system, origin and evolution of paired fins and limbs. Urinogenital system, heart and aortic arches and brain of vertebrates.

Text Books

1. BARNES, R.D. (1982), Invertebrate zoology, IV Ed., Holt Saunders International Edition.
2. BARRINGTON, E.J.W (1979), Invertebrate structure and functions, II Ed., ELBS and Nelson.
3. MOORE, R.C., LOLICKER and FISCHER, A.G. (1952), Invertebrate palaeontology, McGraw Hill Book Co., Inc. New York.
4. WATERMAN, A.J. (1971), Chordate structure and function, the Macmillan company.

Reference Books

1. HYMAN, G.H., The Invertebrates, Vol. I to VII, McGraw Hill Book Co., Inc., New York.
2. VASANT, KA KASHYAP (1997), life of invertebrates, Vikas Publishing House Pvt. Ltd., New Delhi.
3. COLBERT. H. EDWIN (1989), Evaluation of vertebrates, Wiley Eastern Limited, New Delhi.
4. HARREY POUGH, JOHN. B HEISHER, WILLIAM.N. McFARLAND, (1990), Vertebrate life, Macmillan publishing co., New York.

5. JOLLIE, M. (1962), Chordate morphology, Reinholt publishing corporation, New York.
6. ROMER, A.S. (1979), Hyman's Comparative Vertebrate Anatomy, III Ed., The University of Chicago Press, London.
7. YOUNG J.Z. (1950), Life of Vertebrates, Clarendon Press, Oxford.

CORE - II : CELL AND MOLECULAR BIOLOGY AND BIOPHYSICS**REVISED SYLLABUS****Subject Code : 08PZO02****Hours : L+T+P=C****Mark : 100****5 +0+0=3****Unit - I : Cell Structure**

Structure and functions of cell organelles. Structure of Eukaryotic cell- ultra structure of plasma membrane - Endoplasmic reticulum - Mitochondria - Lysosomes - Golgi Complex.

Unit - II : Chromosomes

Structure and function of chromatin - Euchromatin and heterochromatin - Unusual chromosomes (Polytene and Lampbrush) - Cell division and cell cycles.

Unit - III : Nucleic Acids and Their Functions

DNA and RNA - Structure, types and functions - Replication of DNA - DNA repair mechanism - Gene action and protein synthesis.

Unit - IV : Bioinstrumentation (Principles and Uses)

Microscopy (compound - phase contrast - polarising - Electron (TEM and SEM) microscopy) Colorimetry - spectrophotometry (visible, UV, IR) - Centrifuge (Ultracentrifuge) - Electrophoresis (PAGE) - Chromatography (TLC).

Unit – V: Radiobiology

Properties of Natural Light – Biological applications of Xrays, UV rays and infra red rays – Isotopes and their uses in biological investigation – X ray diffraction and Autoradiography and their applications in biology.

Text Books:

1. De ROBERTIS, E.D. P and De ROBERTIS, E,M,F, (1987), “Cell and Molecular Biology”, Lea and Febiger, VIII edition hiladelphia.
2. POWAR, C.B (1983), “Cell Biology”, Himalaya Publishing House, Bombay,

Reference Books:

1. WATSON, J.D., Basker, T.A., Bell, S.P., Gann, A., Levine, M and Losick, R (2004) “Molecular Biology of the Gene”, Pearson Education (Singapore) Pvt.Ltd.,
2. WILSON, G.B. and MORRISON, J.H. (1967), “Cytology” II Edition, Reinhold Publishing Corporation, New York.
3. GIESE, A.C. (1979), “Cell Physiology,” W.B. Saunders Company, Philadelphia.

CORE - III - ADVANCED GENETICS**REVISED SYLLABUS****Subject Code : 08PZO03****Hours : L+T+P=C****Mark : 100****5 +0+0=3****Unit - I : Microbial Genetics**

Evidence of genetic materials in Bacteria - genetic exchange and recombination in bacteria - conjugation, transformation and transduction. Viral genetics - bacteriophage - Mutation in viruses.

Enzyme - regulatory mechanism - operon concept - GAL and LAC operon system - gene regulation in protein synthesis in prokaryotes and eukaryotes..

Unit II : Molecular Genetics

Gene concept - fine structure of gene - one gene one polypeptide concept.

Human Genetics

Gene and metabolic pathways. Inborn errors of metabolism in man.

Haemoglobin disorders - sickle cell anemia and thalassemia.

Human karyotype preparation and chromosomal syndromes in man - Down, Turner's and Klinefelter's syndromes.

Unit – III : Evolutionary Genetics

Genetics of races and species formation – genetic load – genetic polymorphism.

Dosage compensation – X inactivation – genomic imprinting.

Unit – IV : Population Genetics

Population and gene pool – Hardy – Weinberg Law – genetic equilibrium – factors affecting Hardy – Weinberg equilibrium. Calculation of genetic frequencies for complete dominance, multiple alleles and sex linked gene.

Unit – V : Gene Mutation

Chromosomal and point mutation, spontaneous and induced mutation, mutagens : physical, chemical and biological – genetic changes in Neoplasia in Man.

Applied Genetics

Application of genetics in plant and animal breeding – application of genetics in crime of law – DNA finger printing. Genetic basis of twins.

Text Book

1. SINNOT, E. W., DUNN, & L.C. DOBZHANSKY, T.H. (1958). Principles of Genetics, McGraw Hill Co., New York.
2. URSULA GOOD ENOUGH (1984). Genetics, Saunder's College Publishing Co., London.

Reference

1. WATSON, J.D., Baker, T.A., Bell, S.P., Gann, A., Levine, M and Losick, R., (2004) "Molecular biology of the gene" Pearson Education, (Singapore) Pvt. Ltd.,
2. LEVINE, R.P. (1968). The science, Holt Ruinhart & Winston, New York.
3. AYALA, F.I. & KIEGER, J.A. (1980). Modern Genetics, The Benjamin Publishing Co., Inc.,
4. CURSSTEN (1973). Principles of Human genetics, W.H. Freeman and Co.,
5. BURNS, G.W. (1969). The Science of Genetics. The Macmillan Company, New York.
6. MARKERT, C.L. & URSPRUNG (1973). Developmental genetics, Prentice hall.
7. BENJAMIN LEWIN (2000), Genes VII, Oxford University Press, New York.

8. JOHM.D. HAWKINS (1996), Gene structure and expression, III Ed.
Cambridge University Press.
9. ROBERT H. TAMARIN (1996), principles of genetics, WCB publishers.
10. STICKBERGER MANORE. W. (1996), Genetics, Prentice Hall of India Pvt.
Ltd.

**CORE - IV - BASIC CONCEPTS OF MICROBIOLOGY AND
IMMUNOLOGY**

REVISED SYLLABUS

Subject Code : 08PZO04

Hours : L+T+P=C

Mark : 100

5 +0+0=3

MICROBIOLOGY

Unit I : General Microbiology

Morphology types - cell wall of gram positive and gram negative bacteria - Structure and life cycle of DNA (T4 phage) and RNA virus (HIV) and bacteria - sterilization techniques, culture of bacteria - types of media and conditions for culturing.

Microbial control - physical and chemical methods for the control of microorganisms - Antibiotics and their antimicrobial agents - mechanism of Drug resistance.

Unit II : Medicinal Microbiology

Study of causative organisms - modes of transmission and control of common bacteria and viral agents of man - Polio, HIV, HBV A and B, Tuberculosis, Leprosy, Diphtheria, Typhoid, Gonorrhea and Amoebiasis, entamoeba, Balantidium coli, Cholera, Streptococcus, Staphylococcus.

Food Microbiology

Microbes of milk and food – methods of detection – Pasteurization – milk products – curd, butter, ghee, cheese and yoghurt.

Food poisoning – factors influencing spoilage, physico – chemical methods in food preservation.

Unit III : Agro – Microbiology

Nitrogen fixing bacteria – symbiotic and asymbiotic – Mechanism of Nitrogen fixation. PSB / microbes; biological control NPV, BT. Biocomposting – Microbial mediated. Biofertilizers – Azotobacter, Azospirillum, VAM.

IMMUNOLOGY**Unit IV – Innate and Cellular Immunity and Antigens**

Cells of immune systems – origin and differentiation of T, B cells and macrophage – Antigens – class determinants – relative sites and receptor sites.

Vaccines – types of vaccines – mode of action and vaccines for various diseases.

Unit V : Humoral Immunity and Disease Resistance

Antibody – Immunoglobulin – types – subtypes properties and functions.

Major histocompatibility complex (MHC) and its products in man.

Diseases and immune response – viral – bacterial diseases – parasitic infections – tumour immunology.

Immune deficiency diseases – AIDS

Auto immune diseases – examples.

Text Book

1. R.C. DUBEY & D.K. MAHESWARI (1999). A text Book of Microbiology - S. Chand & Co. Ltd., New Delhi.
2. ANANTHANARAYANAN T. and JAYARAMAN PANICKER.C.K (200), Text Book of Microbiology, VI Ed., Orient Longman Ltd. Madras.

Reference

1. MICHAEL PELCZER J. PELCZAR, E.C.S. CHAN. NOEL R. KRIEG, 5th Edition, (1993) Microbiology, Tata – McGraw Hill Edition.
2. PRESSCOTT. L.M. HARTEY. P. KLEIN J. (1990). Microbiology, U.M. C. Brown Publishers.
3. POWAR, C.B. AND DAGNTWALA, H.F. (1992). General Microbiology, Vol. I and II, Himalaya publishing house, Bombay.
4. STANNER R.V. et al., (1989). General Microbiology, Macmillan Company, New York.

5. DAVID FRIED FELDER (1998), Microbial genetics, narosa publishing house, New Delhi.
6. MICHAEL, T. MADIGAN, JOHN. M. MARTINKL, JACK. PARKER (1997), Biology of Microorganisms, VIII Ed., Prentice Hall International Inc. USA.

CORE - PRACTICAL - I
FUNCTIONAL MORPHOLOGY OF INVERTEBRATES AND
CHORDATES, CELL AND MOLECULAR BIOLOGY AND BIOPHYSICS,
ADVANCED GENETICS AND MICROBIOLOGY AND IMMUNOLOGY
REVISED SYLLABUS

Subject Code : 08PZOP01

Hours : L+T+P=C

Mark : 100

0 +0+4=5

I. Functional Morphology of Invertebrates and Chordates

Invertebrates

1. Identification and study of selected Protozoan and Helminthes of medical importance.
2. Identification and study of : Trochophore larva, Nauplius larva, Zoea larva and Bipinnaria larva.
3. Dissection of nervous system of Prawn and Pila.
4. Mounting of mouth parts of Honey bee, Housefly and Mosquito.

Chordates

1. Dissection and display of aortic arches in Frog and Calotes.
2. Dissection and display of portal system of Shark and Frog.
3. Dissection and display of V, IX and X cranial nerves of Shark and Frog.

II. Cell and Molecular Biology and Biophysics

1. Micrometry - simple measurements of cells (any prepared slides) by micrometry.
2. Temporary and permanent squash preparation to study the mitotic and meiotic cell divisions (local insects to be studied)
3. Temporary squash preparation of salivary gland in Chironomous larva.
4. Histochemical localization of proteins, carbohydrates and lipids.

III. Advanced Genetics

1. Drosophila - identification of Mutant Wings and Eyes.
2. Localization of Barr body in the buccal smear (Squamous epithelial cells of man).

IV. Microbiology and Immunology

1. Study of clinical and veterinary protozoans.
2. Study of bacterial diseases of man with reference to gastro - intestinal, respiratory, nervous, genital systems with any two examples for each.
3. Tour report of the visit to food preservation/food fermentation industries and Dairy.

ELECTIVE - I**FIRST AID AND HOME NURSING****REVISED SYLLABUS****Subject Code : 08PZOZ01****Hours : L+T+P=C****Mark : 100****6 +0+0=4****Unit : I**

Principles of first aid. Snake – bites, Dog bites, Insect bites and First Aid.

Unit : II

Fracture, Causes, Types, Signs and Symptoms. First Aid - Treatment. Effects of Heat, Heat Stroke, Signs and Symptoms and First Aid.

Unit : III

Home Nursing – Definition observation of patients condition. Importance of habit observation. Clinical Thermometer and its uses. Counting of pulse, Respiration, how to count respiratory rate.

Unit : IV

Normal and Abnormal Blood Pressure. Specific Infectious Discases. Method of Nursing the patients suffering from them.

Unit : V

Care of sick – Routine Nursing Care of Sick. General application of Heat – Hot baths and hot sponging – Warm baths and Medicated baths. General application of Cold bath and Sponging.

Reference :

1. TRAINEES PRECIS, NCC College, Gwalior.
2. G.S. SHUKLA and V.B. UPADHYAY, Economic Zoology Rastogi Publ. Meerut.

SECOND SEMESTER**CORE - V - BIOSTATISTICS AND COMPUTER APPLICATIONS****Subject Code : 08PZO05****Hours : L+T+P=C****Mark : 100****5+0+0=3****Unit - I : Classification And Presentation Of Data**

Definition – Statistics and its application in Biology – Collection of data.

Classification : Qualitative and Quantitative.

Tabulation: Diagrammatic representation – Graphical representation – frequency curves – frequency polygon and Ogive curve – Population statistics.

Unit – II : Descriptive And Inferential Statistics

Measures of Central tendency : Arithmetic mean – median. Measures of dispersion : Standard deviations and standard errors – co – efficient of variance.

Probability distribution : Binomial and poisson distribution – Student 't' test – estimation and hypothesis. Test of significance – small samples and large samples. X^2 distribution and its uses.

Unit – III : Correlation And Regerssion

Correlation : Correlation of Karl Pearson's Co-efficient of correlation – testing its significance – interpretation.

Regression Analysis : Regression coefficient – construction of regression lines – properties – application.

Unit – IV : Basic Concept On Computers

Introduction to computers – characteristics of computers – Classification of digital computer systems – Anatomy of a digital computer – memory units.

Unit – V: Computer Applications

Computer Software : Programming languages (BASIC, COBOL, FORTRAN, and C – only basic concept) – Windows (WORD). Data processing and Database Management – Internet – E-Mail – Computer applications in Science and Technology.

BIO STATISTICS

Text books :

1. PALANICHAMY, S. and MANOHARAN, M. (1991), "Statistical Methods for Biologists", Palani Paramount Publications, Palani, T.N.
2. GURUMANI, N. (2005), "An Introduction to Biostatistics", II Edition, MJP Publishers, Chennai – 600 005.

COMPUTER SCIENCE

TEXT BOOKS:

1. ALEXIS LEON and MATHEWS LEON (1998; "Fundamentals of Computer Science and Communication Engineering", Leon Techword Chennai.
2. RAJARAMAN, V. (1992), "Fundamentals of computers" 8th Edition, Prentice - Hall of India Private Limited New **Delhi**.

REFERENCE BOOKS

1. RAJARAM, R. (1998), "Basic Computer Science and Communication Engineering". SciTech publications, Chennai-87.
2. MORRIS MANO, M.(1988), "Computer system Architecture", II Edition, Prentice - Hall of India private Ltd., New Delhi - 110001.
3. THOMAS BARTEE, C. (1987), "Digital computer fundamentals", 6th Edition, MCGRAW - HILL BOOK COMPANY, NEWYORK.
4. SUBRAMANIAN,N.(1986) "Introduction to Computers", Tata McGraw - Hill Publishing company Limited, New Delhi.
5. RAM, B. (1997), "Computer Fundamentals -Architecture and Organization", 2nd Edition, New Age International (p) Ltd., Publishers, New Delhi.
6. ALEXIS LEON and MATHEWS LEON (1999), "Fundamentals of Information Technology" Leon Vikas, Chennai.

CORE - VI - BIOCHEMISTRY**Subject Code : 08PZO06****Hours : L+T+P=C****Mark : 100****5+0+0=3****Unit - I : Introduction**

Scope- Atoms, Molecules, Polymerization of organic molecules - major organic components - Chemistry of water - dissolved gases - pH, buffers.

Body Builders And Energy Producers

Structure, classification and functions of proteins, carbohydrates, lipids and nucleic - acids.

Unit - II: Enzymes

Classification and functions of enzymes - Co-enzymes, Iso-enzymes, Allosteric enzymes, Anti-enzymes-Mechanism of Enzyme action - Regulation of enzyme activity - Activators and Inhibitors - Enzyme Kinetics.

Energy Transfer

Flow of energy in biological world - Concept of free energy - Redox potential - coupling of chemical reactions in transfer of energy - Energy rich compounds and their significance.

Unit – III : Metabolism

Protein and aminoacid metabolism – Oxidative deamination, transamination, decarboxylation, transmethylation reactions.

Carbohydrate metabolism – Glycogenesis, glycogenolysis – Energetics of Kreb's cycle – Gluconeogenesis, Cori's Cycle, Glycosuria – Diabetes.

Lipid metabolism – Metabolism of fatty acids, glycerol and cholesterol.

Unit – IV : Regulators**Vitamins**

Structure, sources, requirements, functions and deficiency manifestations of fat soluble and water soluble vitamins.

Minerals

Sources, requirements, functions, absorption and metabolism with reference to Iron, calcium, phosphorus, sodium, potassium and other trace elements as iodine, copper and fluorine.

Unit – V : Hormones

Chemical nature, properties and functions of hormones – Hormonal control of carbohydrate, protein and lipid metabolism. Cyclic – AMP Occurrence, Structure, Synthesis, Degradation and Biological Functions.

Text Books

1. LEHNINGER, ALBERT, DAVID L. NELSON & MICHAEL M. Cox, (1993),
Principles of Biochemistry, CBS Publishers & Distributors, Delhi.
2. STRYER, L. (1988), Biochemistry, W.H. Freeman & Co. NY.
3. COOPER, T.G. (1977), The tools of Biochemistry, Wiley Inter science
Publication, John Wiley & Sons; NY.

CORE - VII - ENVIRONMENTAL SCIENCE**Subject Code : 08PZO07****Hours : L+T+P=C****Mark : 100****5+0+0=3****Unit - I : Ecosystem**

Energy flow in an ecosystem – pyramids, food chain and food web-ecological efficiencies – productivity and its measurements.

Biodiversity : Definition – Importance in biology, basic concepts, types, values, threats to biodiversity, conservation : biodiversity and sustainable development and biodiversity indices.

Unit - II : Natural Resources And Their Conversation

Survey of natural resources : Renewable (forest, wood and water) – forest management – Deforestation and Aforestation – conservation and protection (chipko movement) wild life resources – conservation projects (Girline, Tiger, Crocodile, Rhinoceros and Elephant).

Unit - III : Energy Resources

Non-Renewable resources (land, Energy and mineral) : Conventional (coal, lignite, petroleum and natural gas) Renewable : Non conventional (solar and wind energy) Conventional : Hydel, tidal powers, salinity energy, geothermal Nuclear power.

Biogas programme in India : solar photo volt technology – Programmes in India – solar thermal technology (ST) programmes in India – Tidal power programmes in India – Principles of salinity energy conservation – geotherma) Programme in India – Types of nuclear reactors – nuclear power status around the world and country.

Unit - IV : Pollution And Management

Pollution : Sources, effects and control of air, soil pollutants (solid wastes) and water pollutants – Heavy metals (Mercury, fluoride and lead) – Ground water pollution – Sewage wastewater – sewage treatment – prevention and control – Noise pollution – Radio active pollution – protection – indicator organisms – Bio-accumulation Biomagnification – Bio monitoring of pollutants.

Unit - V : Environmental Education

Goals and objectives, principles of Environmental Education – programmes – status in India – Environmental organizations and agencies – international bodies – man and biosphere programme (MAB) – National organization – Department of environment – forests and wild life (Government of India).

Text Books

1. AGARWAL, K.C., (1999) Environmental Biology, Published by Agro Bolanica, 4.E, 176, J.N. Vyas Nagar, Bikaner, India.
2. ODUM, E.P, (1996) Fundamentals of Ecology (III Edn), Natraraj Publishers, Dehradum.
3. CASTRI, F.D and YOUNES, T. (1996) "Biodiversity; Science And Development" Cab Int., Wallingford, UK.

CORE - PRACTICAL - II
BIostatISTICS AND COMPUTER APPLICATIONS, BIOCHEMISTRY
AND ENVIRONMENTAL SCIENCE

Subject Code : 08PZOP02

Hours : L+T+P=C

Mark : 100

0+0+4=5

I. Biostatistics

Problems related to

1. Mean
2. Standard Deviation
3. Students 't' tests
4. Correlation and regression
5. Chi-square test

II. Computer applications

Demonstration : computers and accessories – their usage.

1. CPU
2. Monitor
3. Key board
4. Mouse

III. Biochemistry

1. Qualitative detection of proteins, carbohydrates and lipid in tissue samples.
2. Quantitative estimation of total proteins and carbohydrates (glucose) in tissue samples.

3. Enzyme kinetics : Influence of pH, temperature, substrate concentration, enzyme concentration and time course on amylase activity.
4. Determination of amino acids in body fluid of Cockroach or grass hopper different animals using paper chromatography.

IV. Environmental science

1. Identification, qualitative analysis of planktons (freshwater/ marine).
2. Study of gut content of various fishes in relation to feeding habits.
3. Hydrobiological studies of water samples with special reference to pollution – O_2 , free CO_2 , Alkalinity, Salinity, (Carbonates and Biocarbonates).
4. Animal association – parasitism and mutualism.
5. Report on ecological collection representating different habitats – sandy, muddy and rocky shores.

Visits : Candidates are expected to study the ecology of chosen habitats and make observations of ecological interest during field studies.

V. Record submission

ELECTIVE - II**NUTRITION AND DIETETICS****Subject Code : 08PZOZ02****Hours : L+T+P=C****Mark : 100****6 +0+0=4****Unit - I**

Introduction – Food as a sources of Nutrition Food intake and its regulations
food is more than nutrients population and food production. Food and future.

Unit - II

Well balanced diet, Nutritive value of some common foods. Nutrition– Diet
in nutritional deficiency diseases – Modifications of normal diet in protein
malnutrition – anemia and vitamin deficiency.

Unit - III

Therapeutic diets – Obesity and under weight. Diabetes mellitus – diagnostic
tests – Diet in Infectious diseases - Typhoid, Tuberculosis, Malaria and Pneumonia.

Unit - IV

Therapeutic diets – Nutrition during pregnancy, Diet in allergy – definition,
common food allergies – dietetic treatment. Nutrition for aged.

Unit - V

Therapeutic diets – modifications and objectives based on causative factors – Diseases of the heart and circulatory systems – atherosclerosis, coronary heart disease, congestive heart failure, hypertension, different – sodium restricted diets.

Reference

1. B. SRILAKSHMI : Food Science, 3rd Ed. New age International (P) Ltd., 2005.
2. WILLIAM C. FRAZIER and C. DENNIS WESTHAFF : Food microbiology, 4th Ed. Tata Mc. Graw Hill Publ. Co. Ltd., 1995.
3. N. SAKUNTALA MARY : Foods facts and principles, 2nd Ed. New Age International Publ., 2005.
4. ROBBINS : Basic Pathology, 7th Ed., Elsevier Publ. Reed Elsevier India Pvt. Ltd., New Delhi, India.
5. AMBIKA SHANMUGAM : Fundamentals of biochemistry for Medical students, 7th Ed., revised Publ. by the author, 1998.

COMMON PER ALL P.G STUDENTS
HUMAN RIGHTS

Subject Code : 08PHR01

Hours : L+T+P=C

Mark : 100

2 +0+0=2

Unit - I

Human Rights – Definition – Classification of rights – Universal declaration of Human rights – International conventions on economic and social rights – constitutional provision for Human rights. Fundamental rights – Directive principles of the state policy. Indian constitution.

Unit - II

Civil and Political Rights – Right to work – right to personal freedom – right to freedom of expression – right to property – right to education – right to equality – right to religion – right to family – right to vote and contest in elections – right to information – right to criticize the Government – right to democratic government.

Unit - III

Economic Rights – Right to work - right to adequate wages – right to reasonable hours of work – Customer rights – Social and cultural rights – Right to clean environment.

Unit - IV

Women's rights - Right to inheritance - Right to marriage divorce and remarry - Right to adoption - Right to education - Rights relating to dowry - Right for equality - Children's rights, Right to protection and care-right to education - issues related with female infanticide - child labour.

Unit - V

Human rights violation - International - National - Regional Level - Organisations to protect Human rights - UNO - National commission for Human rights - States commission - Non-governmental organization and Human rights.

Reference

Sivagami Paramasivam : Studies in Human rights, Sriram Computer Prints & Offset Publishers and Printers. Tamil Nadu, 1996.

Iyathurai C. Human Rights, Ganga Publications, Pudukkottai, Tamilnadu, 2006.

EXTRA DISCIPLINARY COURSE (EDC)**(For the P.G. Students Other than Zoology, admitted from 2008-2009 onwards)****SECOND SEMESTER****SERICULTURE****(Syllabus)****Subject Code : 08PZOED1****Hours : L+T+ C****Mark : 100****4 +0+0****Unit : I**

Introduction – Silk producing organisms – Uses of Silk. Species of silk worm. Sericulture in India. The Central Silk Board (CSB) – Functions of CSB. Research Institutes – The Central Silk Technology Research Institute (CSTRI). Training facilities in Sericulture. National Sericulture Project (NSP). Future Scope.

Unit II :

Moriculture – Morphology of mulberry Plant. Methods of Propagation – seedling – Vegetative – Cutting – Grafting – Tissue Culture. Irrigation. Manuring – Organic and Chemical. Pruning – Objectives of Pruning.

Unit III :

Life cycle of *Bombyx mori*. Rearing of Silkworm – Grainage Management – emergence and fertilization – Egg laying – Hatching. Supply of seed to rearers and commercial rearing. Rearing facilities – Rearing house – Rearing appliances.

Unit IV :

Rearing operations – Disinfection – Brushing – Optimum conditions – Feeding – Bed Cleaning – Spacing – Care during moulting. Diseases of *Bombyx mori* – maggot – peberine – Polyhedrosis – Flacherie.

Unit V :

Harvesting of cocoons Transport and Marketting. Physical characters Defective cocoons. Reeling – re- reeling – Lacing – Skeining. Economic importance of silk.

Tex Book

1. AN INTRODUCTION TO SERICULTURE : 2003 J. Sulochana Chetty, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
2. “Economic Zoology” G.S. Shukla and V.B. Upadhyay 2000. Rastogi publications Meerut 250 002.

EXTRA DISCIPLINARY COURSE (EDC)**(For the P.G. Students Other than Zoology, admitted from 2008-2009 onwards)****SECOND SEMESTER****FISHERY BIOLOGY & AQUACULTURE****(Syllabus)****Subject Code : 08PZOED2****Hours : L+T+ C****Mark : 100****4 +0+0****Unit : I**

Introduction – importance of fisheries. Aim of fish culture Qualities of culturable fishes. Types of fish culture - mono culture – composite culture – paddy cum fish culture.

Unit : II

Fresh water prawn culture – preparation of farm – reproduction – seed collection and transport. Management of production pond – stocking – supplementary feeding – methods of prawn fishing.

Unit : III

Construction and maintenance of fish farm – type of fish ponds – management of fish culture – breeding – types of breeding.

Unit : IV

Harvesting – methods of fishing – electric fishing. Transportation and marketing – structure of a fish market. Marketing system – co – operative system – National Co – Operative Development Corporation capital market. (NCDC).

Unit :V

Preservation and processing – prawn spoilage – preservation and processing.
Fish – Rigor mortis – spoilage. Principles and process of preservation Methods of preservation.

Test Book :

1. “Fishery biology and aquaculture” K. Shanmugam. 1992 LEO Pathippagam. Chennai – 600 083.

Reference Books:

1. “Economic Zoology” G.S. Shukla and V.B. Upadhyay 2000. Rastogi publications Meerut 250 002.
2. “Fish and fisheries of India” V.G. Thingran 1983 2nd ed Hindustan Publications, Delhi.
3. Fish and fisheries : Kamaleswar Pandey and J.P. Shukla. 2005 Rastogi Publications.

EXTRA DISCIPLINARY COURSE (EDC)**(For the P.G. Students Other than Zoology, admitted from 2008-2009 onwards)****SECOND SEMESTER****POULTRY FARMING****(Syllabus)****Subject Code : 08PZOED3****Hours : L+T+ C****Mark : 100****4 +0+0****Unit : I**

Introduction - importance of Poultry Farming - Morphology of a fowl.
General anatomy - Skin - Skeletal System - Digestive System - Reproductive System
- Endocrine System. Habitat of Fowl - Food and Feeding of Fowls.

Unit II:

Fowl house - Location. Kinds of Poultry house - Hatchery - Brooder house -
Broiler house - Layer house. Equipments - Feeders - Catching equipment - Nests -
Hatchery equipments.

Unit III :

Management of growers - Over crowding - Culling of replacement pullets for
egg production and breeding stock - feeding of growing broilers. Management of
layers - Lighting - Culling of non -layers and poor layers. Management of broilers -
Broiler industry - Broiler Chicks - Feeds and feeding management, Prevention of
poultry diseases.

Unit IV :

Egg - Structure - Chemical composition - grading - Preservation -
Marketing of egg.

Unit V :

Poultry meat – production and Processing – Preservation of raw meat
Composition and nutritional value. Inspection and grading. Meat products. By
products of poultry.

Test Book :

Poultry production : R.A., Singh Kalyan Publishers – Revised Edition New
Delhi.

Reference

G.S. Shukla And V.B. Upadhyay (2000) : Economic Zoology, Rastogi
Publications, New Delhi.

THIRD SEMESTER**CORE - VIII : DEVELOPMENTAL BIOLOGY****Subject Code : 08PZO08****Hours : L+T+P=C****Mark : 100****5+0+0=3****Unit - I : Scope of Developmental Biology And Gametogenesis**

Sperm – Ultrastructure of sperm related to sperm motility and egg activation
– Spermatogenesis.

Nuclear activities during oocyte growth – Hormonal, Nervous and Environmental control of ovulation. Ultrastructural organization of the egg with reference to egg membrane, Egg cytoplasm – Oogenesis.

Unit – II : Fertilization And Cleavage

Fertilization – Definition – Process and significance - activation of egg, Sperm – egg interaction – primary and secondary bindings – gamete fusion. Post-fertilization changes. Parthenogenesis (Natural and artificial).

Cleavage – Morphogenetic gradients in the egg cytoplasm – Chemical changes during cleavage – Pattern and factors influencing cleavage – Polarity and gradient.

Unit – III : Gastrulation And Organogenesis

Morphogenetic movements – Nucleocytoplasmic interactions in morphogenesis – Principles, Patterns and Physiology of gastrulation (Amphioxus,

Amphibian, Chick and Mammal) - Fate maps - Fate of germinal layers - Exogastrulation.

Organogenesis - (limb, heart kidney and brain) Foetal membranes- placenta - classification and physiology.

Unit - IV : Metamorphosis And Regeneration

Morphological and biological changes associated with metamorphosis- Hormonal control of amphibian metamorphosis - Neuro - endocrine control of insect metamorphosis.

Regeneration - Experimental data - Regeneration as developmental phenomenon - Polarity and gradient in regeneration.

Unit - V : Experimental Developmental Biology

Embryonic fields - Differentiation - Nuclear factors - Chemical basis of gene action in development.

Genes and differentiation - Factors involved - events in gene action - Genetic code - Regulation of gene action - Information genes and development - Inductors and organizers.

Text Books

1. BALINSKY; B.L, (1981) An Introduction to Embryology, V. Ed., Saunders Co., Philadelphia.
2. BERRILL, N.J. (1986) Developmental Biology, Tata McGraw Hill, New Delhi.

CORE – IX : BASIC CONCEPTS OF BIOTECHNOLOGY**Subject Code : 08PZO09****Hours : L+T+P=C****Mark : 100****5+0+0=3****Unit - I : Historical Background**

Biotechnology : Definition – Scope – Importance – Land marks in the history – Major areas of biotechnology.

Genetic Engineering in micro organisms : Restriction enzyme vectors – plasmids – phage vectors – insertion vectors – Replacement vectors – shuttle vectors – cosmids – phasmids – linkers and adaptors.

Unit – II : Techniques Of Genetic Engineering

rDNA technology : Basic steps – Transformation / Transduction – selection of recombinant – Hybridisation (colony and plaque) – selection of clone (immunological and blotting techniques) – Recovery and expression of clones – PCR technique – Gene probe – DNA finger printing.

Unit - III : Plant And Animal Biotechnology

Cell culture-organ culture-whole embryo culture-Embryo transfer-Invitro fertilization and embryo transfer in human-Human gene therapy.

Unit - IV : Industrial Biotechnology

Fermentation technology: Bioreactor – Microbial products – primary and secondary metabolites (Lactic acid, Alcohol, Vitamins, Penicillin, Vinegar and Enzymes).

Food biotechnology : Single cell protein (SCP) and mycoproteins, production of SCP from bacterial, algal, fungal and yeast biomass.

Enzyme Biotechnology : Properties of enzymes – Free enzymes – Immobilization (methods) – Application of free and immobilized enzymes – Ribozymes and Abzymes.

Unit - V : Applied Biotechnology

To human welfare : Application of rDNA technology in the production of hormones, vaccines and monoclonal antibodies – Transgenesis – methods – Transgenic plants and their application – Transgenic animals.

Biotechnology in agriculture : Commercial application of tissue culture (plants) – Biofuel – Biopesticides.

Cryobiology : Cryo preservation – methods – plant cell bank – pollen bank – Achievements – cryo preservation of stock cells.

Text Books

1. IGNACIMUTHU, S (1998) Basic Biotechnology, Tata McGraw Hill publishing Co., New Delhi.
2. KUMAR, H.D. (1998), Modern concepts of Biotechnology, Vikas Publishing, New Delhi.
3. DUBEY, R.C. (2001), A textbook of Biotechnology, Rajendra Printer, New Delhi.

CORE - X - ANIMAL PHYSIOLOGY**Subject Code : 08PZO10****Hours : L+T+P=C****Mark : 100****5+0+0=3****Unit - I : Nutrition**

Introduction – Role of enzymes in the digestion of carbohydrates, proteins and lipids – Physiology of absorption.

Unit - II : Respiration

Types of respiratory mechanisms – Physiology of respiration in Man – Factors affecting respiration – Respiratory pigments, structure, properties, composition and functions – O₂ and CO₂ transport in animals.

Circulation

Types of hearts – control of heart beat – cardiac cycle – Electrocardiogram – Factors controlling circulation and coagulation of blood – Haemodynamics.

Unit - III : Excretion

Nature and mode of formation of excretory products – Patterns of excretion in relation to environment – Excretory mechanisms in invertebrates and chordates – physiology of excretion in man – Regulation of excretion.

Osmo – Ionic Regulation

Ionic and osmoregulation in invertebrates with reference to Protozoa, Crustacean and Insect – Osmo – ionic regulation in fishes, birds and mammals – hormonal control.

Thermoregulation

Thermoregulation in Homeotherms, Poikilotherms and Heterotherms – Aestivation and Hibernation.

Unit – IV : Nervous Integration

Types of neurons – Transmission of Nerve impulses Synaptic Transmission – Autonomic nervous system organization and functions – Reflex action.

Chemical Co-Ordination

Neurosecretion and its importance in insects – Hormones of vertebrates and their specific role in chemical co-ordination – molecular mechanism of hormone action.

Muscle – Physiology

Molecular structure – Chemical composition – Mechanism of muscle contraction – Regulation and energetics of contraction.

Unit – V : Sensory Physiology

Receptors – Classification and functions – Mechanism of hearing – Physiology of vision in man.

Behavioural Physiology

Migration in fishes and birds Chronobiology – Biological rhythms.

Bioluminescence

Types – Chemical and physical aspects – Functional significance.

Text Books

1. PROSSER, C.L. (1973) Comparative animal Physiology, 3rd Edn, W.B. Saunders & Co. Philadelphia.
2. HOAR, W.S. (1968) General and comparative physiology, Prentice hall.

**CORE - XI - OPTIONAL SUBJECT - I - APPLIED AND STORAGE
ENTOMOLOGY**

Subject Code : 08PZO11

Hours : L+T+P=C

Mark : 100

5+0+0=3

Unit - I : Classification

Classification of insects upto order : Basis of classification – classification of important pests upto order level (any five).

Reasons for insects becoming pests – types of damage caused by insects – pest surveillance, forecasting and monitoring – population dynamics- Insect population Assessments.

Unit - II : Insect Pests Of Crops And Their Management

Pests of cereals (Rice and wheat), Pests of commercial crop (sugar cane), pests of pulses (Red grams) pests of oil seeds (ground nut & coconut), pests of fibre crops (cotton), pests of fruit (Banana, Mango) and vegetables (Ladys finger, Brinjal, Snake gaurd).

Pests of stored products : Sources of infestation – internal and external feeders – control and management.

Unit – III : Principles And Methods Of Pest Management

Natural methods and applied / artificial methods; conventional methods – prophylactic – curative – cultural. Mechanical – physical – legal & Biological methods.

Non conventional methods : Plant products - chemosterilants – anti feedants – pheromones – insect repellants – attractants.

Unit - IV : Chemical Methods Of Pest Management & Ipm

Chemical methods : Pesticides – Insect's resistance to insecticides and methods to reduce it. Effects of pesticides on ecosystem.

Integrated pest management : Methods – components – Need for IPM and its uses.

Unit - V : Insects Related To Human Welfare And Their Management

Beneficial insects : (Honey bee – silk worm – cochineal insects. Insect Galls – Insects in medicine. Helpful insects : predators – parasites – weed killers – soil builders – scavengers.

Text Books

1. RICHARDS, O.W. and DAVIES, R.G., (1984 & 1989). IMMS – A general text book of entomology Vol. I & II, 10th (Edn.) Chapman Hall, Lane London, EC4PEE.
2. VASANTHARAJ DAVID, B, MURALI RANGAN. M.C., MEERA MURALI RANGAN (1992) – Harmful and beneficial Insects – Popular Book Depot, Chennai.
3. VASANTHARAJ DAVID, B. (2001), Elements of economic entomology, Popular Book Depot, Chennai.

CORE - PRACTICAL - III
DEVELOPMENTAL BIOLOGY, BASIC CONCEPTS OF
BIOTECHNOLOGY, ANIMAL PHYSIOLOGY AND APPLIED AND
STORAGE ENTOMOLOGY (OPTIONAL SUBJECT - I)

Subject Code : 08PZOP03

Hours : L+T+P=C

Mark : 100

0+0+4=5

I. Developmental biology

1. Blastoderm Mounting of chick/Duck embryo.
2. Vital staining and Mounting of chick blastoderm of various stages.
3. Amphibia - identification of developmental stages.
4. Study of different types of placenta.
5. Development of vertebrates : eggs –cleavage – blastula – gastrula.

II. Biotechnology

Tour reports of the visits to biotechnological research lab / industries.

III. Animal physiology

1. Qualitative study of digestive enzymes in cockroach.
2. Determination of rate of salt loss and salt gain in fish / crab using different experimental media.
3. Determination of RQ in an aquatic animal in relation to light and temperature (Fish/crab).

4. Qualitative analysis of excretory products.
5. Principles and application of sphygmomanometer and kymograph.
6. Muscle, nerve preparation – Kymographic recordings of simple muscle twitch, summation, Treppe and Tetanus.

IV. Applied and storage Entomology

1. Preparation of key for the identification of insects.
2. Collection, preservation and mounting of important pests of paddy, sugar cane, cotton, pulses, vegetables, fruits and stored products to understand the life history of insects in relation to the life history of plants.
3. Mouth parts of insects of different types to understand their feeding habits.
4. Study of insect : Beneficial, Harmful and insects related to human welfare.
5. Field study to understand the various methods of pest managements : Pesticide formulation, pesticide application, safety measures, hazardous and first aid.
6. Insect box submission.

V. Record submission.

ELECTIVE - III**ACQUIRED IMMUNO DEFICIENCY SYNDROME (AIDS) AND****AWARENESS****Subject Code : 08PZOZ03****Hours : L+T+P=C****Mark : 100****6 +0+0=4****Unit - I**

History, origin, Transmission, Epidemiology of AIDS. Aids related infections.
Psycho-social impact of Aids.

Unit - II

HIV Structure, Pathology of HIV infection, clinical manifestations and diagnosis.

Unit - III

Transmission of HIV - opportunistic infections and associated secondary disorders, signs and symptoms of Aids in children and adults.

Unit - IV

Diagnosis of HIV infection - Dot ELISA, WESTERN BLOT. Prevention from HIV infection. Rapid assessment of Aids knowledge.

Unit - V

Treatment of HIV infection – Awareness – Counseling – care for Person with AIDS. Aids control programmes.

Reference

1. D.S. SHERIFF : Work shop cum seminar on AIDS. Indian Academy of Laboratory Medicine and Rotary Club of Salem North, August 2000.
2. V. KUMARESAN : Biotechnology, Saras Publications, Nagerkoil, 2005. G.S. SHUKLA and V.B. UPADHYAY : Economic Zoology, Restogi Publications, Meerut, 2000.

FOURTH SEMESTER**CORE - XII - EVOLUTION AND TAXONOMY****Subject Code : 08PZO12****Hours : L+T+P=C****Mark : 100****5+0+0=3****Evolution****Unit - I : Origin of life And Theories**

Biochemical origin of life. Theories and concepts of evolution - Neo Lamarckism, Neo - Darwinism - Modern synthetic theory of evolution - Genetics and Natural Selection, Mathematical and experimental analysis of selection.

Unit - II : Speciation

Species concept - speciation - mechanism of speciation. Factors influencing speciation, evolutionary rates & punctuated equilibrium, Hardy Weinberg law and evolution.

Unit - III : Patterns Of Evolution

Evolutionary trends - Orthoselection, Patterns of evolution - Divergent evolution, Convergent evolution, Micro evolution, Macro evolution and Mega evolution.

Geological Time scale, organic evolution at human level, culture & control of human evolution of man, future evolution.

Unit – IV : Adaptation

Adaptation and evolution – colouration of animals, non-adaptive characters.

Animal distribution – evolutionary significance.

Taxonomy

Unit – V : Taxonomy

Nature of international code of zoological nomenclature – Principles relating to nomenclature, Taxonomic keys. Objectives and uses in Zoological studies chaemotaxonomy, Molecular evolution – gene evolution and molecular drive.

Text Book

1. DODSON, E.V. (1960). Evolution process and product. East West Press, New Delhi.
2. PAULAMOS MOODY (1978). Introduction to evolution. Kalyani Publishers, Ludhiana, New Delhi.
3. KAPOOR, V.C. (1986). Theory and practice of animal taxonomy. Oxford & IBH Publishers Co., New Delhi, Bombay, Calcutta.

CORE - XIII - MEDICAL LABORATORY TECHNIQUES**Subject Code : 08PZO13****Hours : L+T+P=C****Mark : 100****5+0+0=3****Unit - I : Instrumentation**

The laboratory : Accidents - Universal work precautions (UWP) for laboratory personnel.

Sterilization : Introduction - sterilization by heat - cold - ultra violet radiation - Ionizing radiations - Filtration - chemical sterilization - Glass preparation for use.

Haematological Techniques**Unit - II**

Knowledge and skill in collecting blood samples. Analysis of blood and basic haematological techniques. Blood cell morphology in health and disease - RBC, WBC, Total count and differential count, Haemoglobin estimation.

Unit - III

Haematocrit, packed cell volume, MCH, MCHC, MCV, Erythrocyte sedimentation rate, RBC fragility test, platelet count. Reticulocytocrit, haemorrhagic disorders, clotting time, Bleeding time, prothrombin time.

Unit – IV : Clinical Analysis

Knowledge and skill in the study and analysis of urine. Physical parameter, Colour, Odor, pH, Density. Chemical parameters routinely required to be analysed – Sugar, Albumin, Ketone bodies and their clinical significances pregnancy tests.

Unit – V : Clinical Studies

Analysis of faeces, semen, cerebrospinal fluid for clinical investigation. Study of vectors in the transmission of diseases with suitable examples. Techniques - RIA, ELISA, WESTERN BLOT and WIDAL TEST.

Text Book

1. SOOD, RAMNIK, (1985). Medicinal Laboratory Technology, Jaypee brothers, New Delhi – 384 pp.
2. KANAI. L MUKHERJEE (1988), Medical Laboratory Technology, vol. I to III, Tata McGraw Hill publishing company Ltd., New Delhi.

CORE - XIV : OPTIONAL SUBJECT - II - SERICULTURE**Subject Code : 08PZO14****Hours : L+T+P=C****Mark : 100****5+0+0=3****Unit - I : General Aspects Of Silkworms**

Types of silkworms - Mulberry, tasar, muga, eri - Morphology and life cycle of silkworms - Races of mulberry silkworms - Voltinism.

Unit - II : Mulberry Cultivation

Selection of land and cultivation of mulberry - Mulberry varieties - Different methods of planting - Organic and inorganic manure application - Pruning - Harvest and preservation of leaves - Pest and diseases of mulberry and their control measures.

Unit - III : Silkworm Rearing

Disinfection of rearing houses and appliances - Egg handling - Hatching - Brushing - Silkworm rearing techniques; young age and late age - Rearing environmental conditions - Shoot harvest method of rearing - Spacing and leaf requirement in different stages - Pest and diseases of silkworm and preventive measures - Spinning and mounting - Types of mountage - Harvesting of cocoon and cocoon assessment - Transportation and marketing.

Unit - IV : Grainage Techniques

Egg production - Acid treatment of hibernating eggs - Loose egg production - Grainage techniques - Materials required for a grainage.

Unit – V : Silk Reeling

Reeling methods – Re-reeling – Silk examination, cleaning, lacing, skeining, book making – Grading of silk.

Text Books

1. RANGASAMY, G. (1987), Manual on sericulture FAO, Vol. I-IV, Agriculture service bulletin, CSB, Bangalore, India.
2. DANDIN, S.B. (2004), Hand book of new sericulture technologies, Central Silk Board, Bangalore, pp 287.
3. GANGA G. and J. SULOCHANA CHETTY : An introduction to sericulture, 2nd Edition Vijay Pramlani Publ. for Oxford and IBH Publ. Co. New Delhi, 2005.

CORE - PRACTICAL - IV
EVOLUTION AND TAXONOMY, MEDICAL LABORATORY
TECHNIQUES, SERICULTURE (OPTIONAL SUBJECT - II)
AND MICROTECHNIQUE

Subject Code : 08PZOP04

Hours : L+T+P=C

Mark : 100

0+0+4=5

I. Evolution and Taxonomy

Study of fossils.

II. Medical Laboratory Techniques

1. Genetic and immunological basis of human blood grouping (A,B,AB,O, and Rh)
2. Estimation of haemoglobin (Hb) and Erythrocyte Sedimentation Rate (ESR).
3. Preparation of RBCs and WBCs.
4. Preparation of antiserum.
5. Electrophoretic analysis of blood serum.
6. Blood-clotting time, bleeding time, rouleux formation - preparation of Haemin crystals.
7. Qualitative analysis of urine for proteins, glucose, acetone and ketone bodies.

III. Optional subject – II – Sericulture

1. Identification of common mulberry varieties and their features.
2. Identification of pests and diseases of mulberry.
3. Suitable mulberry leaves for young age silkworm rearing.
4. Model of a rearing house for shoot method rearing.
5. Identification of various types of silkworms and silk moths and their external morphology.
6. Various stages of larva and their identification in *Bombyx mori*.
7. Identification of important pests and diseases of silkworm *Bombyx mori*.
8. Dissection and display of silk gland of *Bombyx mori*. (V instar larva).
9. Dissection and display of digestive system of *Bombyx mori* larva. (V instar larva).
10. Dissection and display of reproductive system of *Bombyx mori* larva. (V instar larva).
11. Acid treatment of diapausing eggs of silk worm *Bombyx mori* for breaking diapause.
12. Visit of silk farms and silk reeling, weaving units in nearby areas and submission of tour report.

IV. Micro technique

1. Spreading of serial sections.
2. Preparation of permanent mount of serial sections.

V. Submission of Slide box.**VI. Submission of Record.**

ELECTIVE - IV
ECONOMIC ZOOLOGY

Subject Code : 08PZOZ04

Hours : L+T+P=C

Mark : 100

6 +0+0=4

Unit - I

House hold insects – Insects damaging house hold goods – Insects affecting human health – houseflies, mosquitoes, bed bug and fleas.

Unit - II

Apiculture – Social organization of honey bee – Hive – Selection of bees for apiculture – Methods of bee keeping. Advances of modern method products of bee keeping.

Unit - III

Prawn fishery – Types of prawn fishery – Culture of fresh water prawn- Culture of marine prawn – Preparation of farm. Preservation and processing of prawn. Export of prawn.

Unit - IV

Fish culture – Aim of fish culture – Breeding pond – Fish seed - Hatching pond. Transport of fish fry to Nursery ponds. Harvesting – Preservation of fish – Composite fish farming. By – Products of fishing Industry.

Unit - V

Vermi - Culture - Morphology of earthworm - Food and feeding habits - Digestive system - Gut - microflora and their importance. Role of earthworm in organic farming - Soil fertility - Soil aeration - Vermi cast - decomposition of biodegradable waste and Vermi composting.

Reference

1. B. VASANTHARAJ DAVID and T. KUMARASWAMI : Elements of Economic Entomology Pop. Book Depot. Chennai, India, 1998.
2. R.K. BHATNAGAR and R.K. PALPA : Vermi Culture and Vermi compositing, Kalyani Publishers, New Delhi, 1996.
3. ARUL K. SHARMA : A Hand book of organic farming, Agro. Bio. Jothpur, India.
4. Dr. G.S. SHUKLA and Dr. V.B. UPADHYAY : Economic Zoology, Rastogi Publications, Shivaji Road, Meerut - 260 002, India.
5. "Fishery biology and aquaculture" K. Shanmugam. 1992 LEO Pathippagam. Chennai - 600 083.

EXAMINATION

THEORY

University Examination (UE)	Internal Assessment (IA)
75 Marks	25 Marks

CLASSIFICATION OF INTERNAL ASSESSMENT STRUCTURE

	Marks
Seminar	- 5
Test	- 10
Assignment	- 5
Attendance	- 5
Total	- 25 Marks
Passing minimum (IA) - 50%	- 12 marks
Passing minimum (UE) - 50%	- 38 marks
Total Passing minimum	- 50 marks

PRACTICAL

University Examination (UE)	Internal Assessment (IA)
60 Marks	40 Marks

Passing minimum (IA) – 50% - 20 marks

Passing minimum (UE) – 50% - 30 marks

Total Passing minimum - 50 marks

CLASSIFICATION OF INTERNAL ASSESSMENT STRUCTURE

40 Marks

Marks

Practical Attendance - 10

Practical – Performance - 20

Record Work - 10

Total - 40 Marks

**QUESTION PAPER PATTERN FOR M.Sc. DEGREE COURSE
ZOOLOGY**

THEORY

(For the Students admitted from 2008 – 2009 on wards)

Time : 3 Hrs.

Max. Marks : 75

PART - A (5 x 5 = 25)

Answer **ALL** question choosing either 'a' or 'b' Each answer not exceeding 250 words. All questions carry equal marks.

PART - B (5 x 10 = 50)

Answer **ALL** question choosing either 'a' or 'b' Each answer not exceeding 500 words. **ALL** questions carry equal marks.

M.Sc. DEGREE COURSE**ZOOLOGY****QUESTION PAPER PATTERN FOR PRACTICAL EXAMINATION**

(For the Students admitted from 2008 – 2009 on wards)

Core - Practical - I & II

Time 4 hours		Maxmium Marks 60
		Practical 50
		Record 10
Question Number 1	20 marks	
Question Number 2	8 marks	
Question Number 3	6 marks	
Question Number 4	6 marks	
Question Number 5	10 marks	
Record Submission	10 marks	

Core - Practical - III & IV

Time 4 hours		Maxmium Marks 60
		Practical 45
		Record & other submissions 15
Question Number 1	15 marks	
Question Number 2	8 marks	
Question Number 3	6 marks	
Question Number 4	6 marks	
Question Number 5	10 marks	
Record Submission	10 marks	
Insect box / Slide box	5 marks	

(For the candidates admitted from 2008-2009 onwards)

M.SC. DEGREE EXAMINATION,

Zoology

FIRST SEMESTER

CORE - I

FUNCTIONAL MORPHOLOGY OF INVERTEBRATA AND CHORDATA

Time : Three Hours

Maximum : 75 Marks

Part A -(5x5=25 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 250 words. All questions carry equal marks.

1. a. Give an account of deep sea sponges.
(or)
b. Write about respiration in protozoa.
2. a. Explain the nervous system of coelenterates.
(or)
b. Give an account of Class : Turbellaria.
3. a. Describe briefly Archiannelids.
(or)
b. Write notes on affinities of xiphosuran.
4. a. Describe the origin of elasmobranchs.
(or)
b. What are the problems met by first amphibians and how did they solve them?
5. a. Describe the features of Archaeopteryx.
(or)
b. Write an account of egg laying mammals.

Part B- (5x10=50 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 500 words. ALL questions carry equal marks.

6. a. How do protozoans reproduce?
(or)
b. Describe the functional morphology of canal system in sponges.

7. a. Explain the structural peculiarities and affinities of Ctenophores.
(or)
b. Give an account of parasitic adaptations of platyhelminthes.

8. a. Give an account of water vascular system in star fish.
(or)
b. Discuss in detail the coelom and coelomocytes of echinoderms.

9. a. Write an essay on migration in fishes.
(or)
b. Write an essay on origin and evolution of Amphibia.

10. a. Describe the origin of birds.
(or)
b. Give a comparative anatomy of heart in vertebrates.

(For the candidates admitted from 2008-2009 onwards)

M.SC. DEGREE EXAMINATION

Zoology

FIRST SEMESTER

CORE - II

CELL AND MOLECULAR BIOLOGY AND BIOPHYSICS

Time : Three Hours

Maximum : 75 Marks

Part A -(5x5=25 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 250 words. All questions carry equal marks.

1. a. Give an account of structure and functions of endoplasmic reticulum.
(or)
b. Write short notes on Lysosomes.
2. a. Write an account of structure and chemistry of chromosomes with its hereditary function.
(or)
b. Give a brief account of lampbrush chromosomes and discuss its utility in cytogenetic studies.
3. a. Describe the structure of a DNA
(or)
b. Explain DNA repair mechanism in brief.
4. a. Describe the different parts of an electron microscope and discuss the different types of electron microscope.
(or)
b. Describe the technique of ultra centrifugation.
5. a. Explain Biological effects of X-rays with examples.
(or)
b. What are isotopes? Explain the uses of isotopes.

Part B- (5x10=50 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 500 words. ALL questions carry equal marks.

6. a. Give an account of the structure and functions of plasma membrane.
(or)
b. Give an account of structure and functions of mitochondria.

7. a. Describe the structure of nuclear pore complex and discuss the mechanism of nucleocytoplasmic control.
(or)
b. What is cell division? Discuss the use and biological significance of meiotic cell division.

8. a. Write an essay on gene actions in protein synthesis.
(or)
b. Describe the structure and functions of different types of RNA.

9. a. Explain the principle and uses of colorimetry.
(or)
b. Describe the technique of electrophoresis. How does this technique help in the study of proteins of a cell?

(For the candidates admitted from 2008-2009 onwards)

M.SC. DEGREE EXAMINATION

Zoology

FIRST SEMESTER

CORE - III

ADVANCED GENETICS

Time : Three Hours

Maximum : 75 Marks

Part A -(5x5=25 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 250 words. All questions carry equal marks.

1. a. Explain the mechanism of bacterial transformation.
(or)
b. Explain in brief the LAC operon system
2. a. Write a note on Down's syndrome.
(or)
b. Describe the structure of a gene.
3. a. What is genetic load?
(or)
b. What is 'X' inactivation?
4. a. How will you calculate the genetic frequencies of complete dominant genes?
(or)
b. How do natural selection affect Hardy-Weinberg equilibrium?
5. a. What is induced mutation? Explain with examples.
(or)
b. Give a short account on DNA finger printing.

Part B- (5x10=50 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 500 words. ALL questions carry equal marks.

6. a. What are the evidences for DNA as genetic material in bacteria?
(or)
b. Describe in detail the gene regulation in protein synthesis.
7. a. Write an essay on gene concept with special emphasis on fine structure of gene.
(or)
b. Give a detailed account on inborn errors of metabolism in man.
8. a. Comment on genetics of species formation.
(or)
b. Write an essay on genetic polymorphism.
9. a. Define Hardy-Weinberg's law and explain how do the genetic equilibrium is maintained?
(or)
b. Enumerate and explain the factors affecting genetic equilibrium.
10. a. What are mutagens? Classify with examples.
(or)
b. Comment on the application of genetics in the study of twins.

(For the candidates admitted from 2008-2009 onwards)

M.SC. DEGREE EXAMINATION,

Zoology

FIRST SEMESTER

CORE - IV

BASIC CONCEPTS OF MICROBIOLOGY AND IMMUNOLOGY

Time : Three Hours

Maximum : 75 Marks

Part A -(5x5=25 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 250 words. All questions carry equal marks.

1. a. Describe the structure of a typical plant virus.
(or)
b. Describe the structure of T4 bacteriophage.
2. a. Discuss the mode of transmission of HIV virus.
(or)
b. List out the physico-chemical methods in food preservation.
3. a. Write notes on PSB/microbes.
(or)
b. What are biofertilizers?
4. a. Briefly write about the origin of T and B cells.
(or)
b. What are different types of Vaccines?
5. a. List out different types of immunoglobulins.
(or)
b. What are different types of hypersensitivity.

Part B- (5x10=50 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 500 words. ALL questions carry equal marks.

6. a. Discuss the lytic and lytogenic cycle of bacteriophage.
(or)
b. Explain the physical and chemical methods for control of micro organisms.
7. a. What are the factors influencing spoilage of food.
(or)
b. Give an account of pasteurization of milk.
8. a. Write an essay on nitrogen fixation.
(or)
b. Give an account of biocomposting
9. a. Discuss the mode of action of vaccines for various diseases.
(or)
b. Give an account of alternative pathways and immunological significance.
10. a. Discuss in brief the diseases of immune response.
(or)
b. Give an account of properties and functions of immunoglobulins.

(For the candidates admitted from 2008-2009 onwards)

M.SC. DEGREE EXAMINATION,

Zoology

FIRST SEMESTER

ELECTIVE - I

FIRST AID & HOME NURSING

Time : Three Hours

Maximum : 75 Marks

Part A -(5x5=25 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 250 words. All questions carry equal marks.

1. a. What are the golden rules of first aid?
(or)
b. What first aid you will give for a snake bite patient.
2. a. Enumerate the causes and types of fracture.
(or)
b. What are the causes of burns and scalds?
3. a. List out the different types of poisoning.
(or)
b. What is a heat stroke? What is the first aid to be given?
4. a. Enumerate the different types of emergency situation in a community.
(or)
b. What are the different types of natural calamities?
5. a. What do you know about the clinical thermometer and its use?
(or)
b. Write brief notes on normal and abnormal blood pressure.

Part B- (5x10=50 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 500 words. ALL questions carry equal marks.

6. a. What are responsibilities of a first aider?
(or)
b. Discuss the scope of first aid and explain the kit for a first aider.

7. a. Explain the first aid for burns and scalds.
(or)
b. Explain the first aid to be given for a fracture patient.

8. a. Give an account of first aid for poisoning.
(or)
b. Give a detailed account on first aid for foreign body injuries.

9. a. Explain the first aid steps to be taken at the time of earth quake.
(or)
b. As a first aider how will you manage the people during flood?

10. a. What are the general routine nursing care of the sick.
(or)
b. Give an account of Warm, cold and medicated baths.

(For the candidates admitted from 2008-2009 onwards)

M.SC. DEGREE EXAMINATION,

Zoology

SECOND SEMESTER

CORE - V

BIOSTATISTICS AND COMPUTER APPLICATIONS

Time : Three Hours

Maximum : 75 Marks

Part A -(5x5=25 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 250 words. All questions carry equal marks.

1. a. Define primary data and mention its types.
(or)
b. Mention the different types of diagrammatic representations and explain any one type with an example.

2. a. Mention the merits and demerits of Arithmetic mean.
(or)
b. Calculate the median for the following data on the weight (in grams) of 160 fishes :

Weight in gms	No. of fishes
0-10	10
10-20	25
20-30	55
30-40	40
40-50	30
	<hr/> N = 160 <hr/>

3. a. Briefly explain the different types of correlation analysis.
(or)
b. What is Regression analysis? Explain its applications.
4. a. Classify digital computers in detail.
(or)
b. Give an account of different types of input and output devices of a computer.

5. a. Write the basic concept of C language and mention its types.
(or)
b. Explain the concept of E-mail and discuss its applications.

Part B- (5x10=50 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 500 words. ALL questions carry equal marks.

6. a. Draw a component bar diagram for the following data and write down you procedure (use a graph sheet).

No. of fish varieties obtained from 3 lakes are as follows :

Types of fish	Lake 1	Lake 2	Lake 3
Catla	45	40	25
Mrigal	65	60	35
Rohu	40	70	60

(or)

- b. Draw a frequency polygon for the following frequency distribution of weight of 500 fishes. Write down the procedure you have followed :

Weight (in gms) :	100-200	200-300	300-400	400-500
No. of fish :	80	200	120	100

(Graph sheet to be supplied).

7. a. Write an essay on different types of measures of dispersion with suitable examples.

(or)

- b. From the following data, by using student's 't' test, find whether the pesticide has got significant effect on the blood glucose level in fish. Comment on your result.

Blood glucose level (mg/100 ml)	
Control fish	Pesticide - treated fish
10	25
15	40
25	30
15	35
20	50
-	60

(Table 't' value for 9 df at 5% level = 2.262).

8. a. Calculate the Karl Pearson's co-efficient of correlation for the following data and comment on your result :

Weight of fish (gms) :	25	32	45	50	58
Lipid content of muscle (mg/gm) :	140	160	120	110	70

(or)

- b. From the following data, calculate the Regression line of X on Y :

Length of fish (cms) (X) :	4	6	8	9	13
Weight of fish (gm) (Y) :	40	60	75	85	120

From the regression line, calculate the weight of the fish which has got a length of 25 cms.

9. a. Write an essay on the anatomy of digital computer.
(or)
b. Give a detailed account on the evolution of computers.
10. a. Write an essay on data processing and database management in computers.
(or)
b. With suitable example, explain the different aspects of WORD as a best operating system.

(For the candidates admitted from 2008-2009 onwards)

M.SC. DEGREE EXAMINATION,

Zoology

SECOND SEMESTER

CORE - VI

BIOCHEMISTRY

Time : Three Hours

Maximum : 75 Marks

Part A -(5x5=25 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 250 words. All questions carry equal marks.

1. a. Enumerate the properties of water.
(or)
b. Derive Henderson – Hasselbalch's equation.
2. a. Write the significance of energy rich compounds.
(or)
b. Explain the concept of free energy.
3. a. Outline the steps involved in gluconeogenesis.
(or)
b. Explain how glycogen metabolism is regulated.
4. a. Enumerate the uses of Copper and Iodine?
(or)
b. Describe the biochemical role of Vitamin K.
5. a. Explain the function of gastrointestinal hormones.
(or)
b. Describe the chemical nature and function of estrogen.

Part B- (5x10=50 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 500 words. ALL questions carry equal marks.

6. a. Write about the structure and classification of carbohydrates.
(or)
b. Define Membrane Permeability. Explain.
7. a. Explain the factors influencing enzyme action.
(or)
b. Describe the mechanism of enzyme action.
8. a. Describe the general metabolic reactions of amino acids.
(or)
b. Write on any three inborn errors of metabolism.
9. a. List the functions and deficiency manifestations of Vitamin B.
(or)
b. Elaborate on the biochemical functions of Vitamin C.
10. a. Give an account on thyroid glands and its hormones.
(or)
b. Analyze the effect of insulin on metabolism.

(For the candidates admitted from 2008-2009 onwards)

M.SC. DEGREE EXAMINATION,

Zoology

SECOND SEMESTER

CORE - VII

ENVIRONMENTAL SCIENCE

Time : Three Hours

Maximum : 75 Marks

Part A -(5x5=25 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 250 words. All questions carry equal marks.

1. a. Explain the structure of an ecosyotem.
(or)
b. What are the values of bio diversity?
2. a. Chipko movement.
(or)
b. Classify natural resources.
3. a. Bio gas programme.
(or)
b. List out the energy resources.
4. a. What are the sources of air pollution.
(or)
b. Write about Biomagnification.
5. a. List out the wild life sanctuaries in India.
(or)
b. What are the goals and objectives of environmental education.

Part B- (5x10=50 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 500 words. ALL questions carry equal marks.

6. a. Give an account of productivity and its measurements in an ecosystem.
(or)
b. Discuss different types of threats to biodiversity. Explain the conservation measures to be taken.
7. a. Write about the importance of natural resources.
(or)
b. Give an account of conservation projects of natural resources in India.
8. a. Explain in detail about the conventional energy.
(or)
b. Discuss the solar thermal programmes in India.
9. a. Enumerate the ecological effects of water pollution.
(or)
b. Explain the steps involved in the treatment of sewage.
10. a. Briefly explain the Environmental education programmes in India.
(or)
b. Explain the organization and agencies involved in environmental education.

(For the candidates admitted from 2008-2009 onwards)

M.SC. DEGREE EXAMINATION,

Zoology

SECOND SEMESTER

ELECTIVE - II

NUTRITION AND DIETETICS

Time : Three Hours

Maximum : 75 Marks

Part A -(5x5=25 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 250 words. All questions carry equal marks.

1. a. "Food as a source of nutrition" substantiates.
(or)
b. What are the functions of food.
2. a. Explain Balanced diet
(or)
b. Write short notes on food groups.
3. a. Formulate diet for anaemia.
(or)
b. Formulate diet for vitamin A deficiency.
4. a. What are the common food allergies?
(or)
b. What are the common diseases of heart?
5. a. Write notes on nutrition for aged.
(or)
b. What do you know about obesity and under weight?

Part B- (5x10=50 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 500 words. ALL questions carry equal marks.

6. a. What are the factors influencing human nutrition?
(or)
b. Give an account of nutritional problems in India.
7. a. Explain in detail the nutritive value of some common food groups.
(or)
b. Critically analyse the food intake and its regulation.
8. a. Give an account of modification of normal diet in protein malnutrition.
(or)
b. Write about the diet for gastro-intestinal disorders.
9. a. What are the therapeutic diet for the patients suffering from heart and circulatory system?
(or)
b. Comment on the dietetic treatment for food allergies.
10. a. What is the specific nature of therapeutic diet for diabetes mellitus.
(or)
b. Discuss the specific nutritional care to be taken during pregnancy.

HUMAN RIGHTS
COMMON FOR ALL P.G. COURSES

Model Question

Time : Three hours

Maximum : 75 Marks

PART - A (5X5 = 25 Marks)

Answer all Questions

All Questions Carry Equal Marks

- 1.a) What is meant by "Human Rights".
(or)
b) Write a note on directive principles of Indian constitution.

- 2.a) Comment on the right to form association.
(or)
b) Point out the cultural rights.

- 3.a) Briefly explain the National Human Rights commission
(or)
b) Discuss the rules and regulations of State human rights commission of 1992.

- 4.a) Write short notes on "Chipko movement"
(or)
b. Give an account of the SC/ST movement in India

- 5.a) List out the rights of Transgenders
(or)
b) How rights of children are violated ?

PART - B (5X10 = 50 Marks)**Answer all Questions****All Questions Carry Equal Marks**

- 6.a) Discuss the basic philosophy of universal declaration of Human Rights
(or)
b) Explain the importance of International covenants of economic and social rights
- 7.a) How Human Rights are violated in the case of HIV/AIDS patients?
(or)
b) Discuss the basic rights of women and how it is violated in India
- 8.a) Give an account of Indian freedom movement
(or)
b) What are the objectives and goals of Environment movement in India ?
- 9.a) Assess the rules of and regulations of state human rights commission 1997.
(or)
b) Give an account of the structure and function of National Human Rights commission
- 10.a) Explain the necessity of right to work and right to adequate wages
(or)
b) Discuss the importance of rights to religion in a multicultural society.

(For the candidates admitted from 2008-2009 onwards)
EXTRA DISCIPLINARY COURSE (EDC)
FOR ALL P.G. STUDENTS OTHER THAN P.G. ZOOLOGY
SECOND SEMESTER
SERICULTURE

Time : Three Hours

Maximum : 75 Marks

Part A -(5x5=25 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 300 words. All questions carry equal marks.

1. a. How silkworm seed supplied to rearer and commercial rearers?
(or)
c. Describe the management of egg laying.
2. a. Explain irrigation methods for mulberry.
(or)
b. Define pruning. What are the objectives of pruning?
3. a. What are the uses of silk?
(or)
b. What are the functions of Central Silk Board?
4. a. Bring out the economic importance of silk?
(or)
b. Explain marketing of cocoons
5. a. Explain the importance of bed cleaning?
(or)
b. What are the optimum conditions required for silkworm rearing?

Part B- (5x10=50 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 500 words. ALL questions carry equal marks.

6. a. Give an account of diseases of silk worm
(or)
b. What are the physical characters of cocoon?
7. a. Explain reeling and re-reeling of silk
(or)
b. Give an account of disinfection.
8. a. What are the research institutes of Sericulture?
(or)
b. Explain in detail the National Sericulture Project.
9. a. Write an account of methods of propagation of mulberry
(or)
b. Discuss the methods of manuring
10. a. Describe the life cycle of *Bombyx mori*.
(or)
b. What are the rearing appliances used for sericulture practice?

(For the candidates admitted from 2008-2009 onwards)
EXTRA DISCIPLINARY COURSE (EDC)
FOR ALL P.G. STUDENTS OTHER THAN P.G. ZOOLOGY
SECOND SEMESTER
FISHERY BIOLOGY AND AQUACULTURE

Time : Three Hours

Maximum : 75 Marks

Part A -(5x5=25 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 300 words. All questions carry equal marks.

1. a. What are the qualities of culturable fishes?
(or)
b. Explain aim of fish culture
2. a. Briefly explain the reproduction of prawn
(or)
b. What are the precautions to be taken while transporting prawn seeds?
3. a. Explain different types of fish breeding.
(or)
b. Discuss fertilization of a fish farm
4. a. Explain structure of a fish market.
(or)
b. What do you know about electric fishing
5. a. Write brief notes an spoilage of prawns
(or)
b. What is Rigor mortis? Explain principles of preservation.

Part B- (5x10=50 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 500 words. ALL questions carry equal marks.

6. a. Give an account of various methods preservation of fish
(or)
b. Write an account of preservation and processing of prawns.
7. a. Write an account on different types of major carps used in culture practice.
(or)
b. Discuss different types of fish culture
8. a. Explain various methods of fishing
(or)
b. Give an account of transportation and marketing system of fish.
9. a. Write an account on different types of ponds in fish culture
(or)
b. Give an account of fish pond management
10. a. Discuss the "Supplementary feeding for prawn culture"
(or)
b. Explain different methods of prawn fishing.

(For the candidates admitted from 2008-2009 onwards)
EXTRA DISCIPLINARY COURSE (EDC)
FOR ALL P.G. STUDENTS OTHER THAN P.G. ZOOLOGY
SECOND SEMESTER
POULTRY FARMING

Time : Three Hours

Maximum : 75 Marks

Part A -(5x5=25 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 300 words. All questions carry equal marks.

1. a. Explain food and feeding habit of fowls.
(or)
b. Describe the morphology of fowl.
2. a. Enlist the meat products of poultry.
(or)
B. Discuss the nutritional value of poultry meat.
3. a. How will you select the location of a poultry house?
(or)
B. What is a hatchery? Briefly explain
4. a. What do you know about culling of layers?
(or)
b. Discuss deep litter management
5. a. Bring out the importance of marketing of eggs.
(or)
b. Describe structure of an egg,

Part B- (5x10=50 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 500 words. ALL questions carry equal marks.

6. a. Give an account of preservation of egg.
(or)
B. Explain the methods of grading of egg.
7. a. Write an account on nutritional value of poultry meat.
(or)
B. Elaborate the processing and preservation raw meat.
8. a. Briefly explain the feeding management of broilers
(or)
b. Give an account of prevention of poultry diseases
9. a. Describe the reproductive system of a fowl.
(or)
B. Bring out the importance of poultry farming
10. a. Explain different types of feeders
(or)
b. What are the different kinds of poultry houses

(For the candidates admitted from 2008-2009 onwards)

M.SC. DEGREE EXAMINATION,

Zoology

THIRD SEMESTER

CORE - VIII

DEVELOPMENTAL BIOLOGY

Time : Three Hours

Maximum : 75 Marks

Part A -(5x5=25 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 250 words. All questions carry equal marks.

1. a. Write a brief note on Oogenesis
(or)
b. Describe a mammalian spermatozoon
2. a. Explain post fertilization changes
(or)
b. Explain the phenomenon of natural parthenogenesis
3. a. Trace the fate of germinal layers
(or)
b. Exogastrulation
4. a. Explain polarity and gradient in regeneration
(or)
b. What are the morphological changes associated with metamorphosis?
5. a. Give a brief note on role of yolk utilization in embryonic nutrition
(or)
b. Write notes on genetic code

Part B- (5x10=50 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 500 words. ALL questions carry equal marks.

6. a. Give an account of ultra structure of the egg membrane
(or)
b. Define gametogenesis. Add a detailed account on spermatogenesis

7. a. Discuss the factors influencing cleavage
(or)
b. Write an account on fertilization

8. a. Give an account of gastrulation in frog
(or)
b. Classify the foetal membranes. Add a note on their functions

9. a. Discuss regeneration as a developmental phenomenon
(or)
b. Write an account on the neuroendocrine control of insect metamorphosis

10. a. Give an account of gene action in development
(or)
b. Discuss the role of organizer in development of an embryo

(For the candidates admitted from 2008-2009 onwards)

M.SC. DEGREE EXAMINATION

Zoology

THIRD SEMESTER

CORE - IX

BASIC CONCEPTS OF BIOTECHNOLOGY

Time : Three Hours

Maximum : 75 Marks

Part A -(5x5=25 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 250 words. All questions carry equal marks.

1. a. Define biotechnology and explain its scope
(or)
b. Write a brief note on plasmids
2. a. Explain the methodology adopted in DNA finger printing
(or)
b. Explain PCR (Polymerase chain reaction) technique in rDNA technology
3. a. Explain the technique of IV F (in - vitro fertilization)
(or)
b. Write notes on gene therapy
4. a. What are the microbial products?
(or)
b. Single cell protein (SCP)
5. a. Explain the role of Cryo preservation in biotechnology
(or)
b. What are the different methods of transgenesis

Part B- (5x10=50 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 500 words. ALL questions carry equal marks.

6. a. Give an account of genetic engineering in micro organisms
(or)
b. Explain the role of vectors in genetic engineering
7. a. What are the basic steps involved in Transformation
(or)
b. How cloned genes are used in the production of vaccines
8. a. "Cell culture is a boon in biotechnology" - substantiate
(or)
b. Discuss the methodology and significance of embryo culture
9. a. Explain the process of vinegar production
(or)
b. What is immobilization? Describe the methods of immobilization
10. a. Explain the role of biotechnology in production of bio fuels
(or)
b. Discuss the cryopreservation technology employed in preservation of stock cells

(For the candidates admitted from 2008-2009 onwards)

M.SC. DEGREE EXAMINATION

Zoology

THIRD SEMESTER

CORE - X

ANIMAL PHYSIOLOGY

Time : Three Hours

Maximum : 75 Marks

Part A -(5x5=25 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 250 words. All questions carry equal marks.

1. a. Write the role of intestinal juices in digestion
(or)
b. Describe the role of enzymes in carbohydrate digestion
2. a. Electro cardio gram (ECG)
(or)
b. Write notes on haemodynamics
3. a. Classify the animals based on their excretory products
(or)
b. Explain the osmoregulatory mechanism among protozoans
4. a. Write notes on autonomic nervous system
(or)
b. Briefly explain the importance of neurosecretion in insects
5. a. Write short notes on biological rhythm
(or)
b. Classify the receptors. Add a note on their functions

Part B- (5x10=50 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 500 words. ALL questions carry equal marks.

6. a. Explain the physiology of absorption
(or)
b. Discuss the role of enzymes in protein digestion
7. a. Give an account of respiratory pigments
(or)
b. Explain the various types of respiratory mechanisms of animals
8. a. Critically discuss the patterns of excretion in relation to environment
(or)
b. Define thermoregulation. How body temperature is maintained in poikilotherms?
9. a. Give an account of synaptic transmission of nerve impulse
(or)
b. Write an essay on mechanism of muscle contraction
10. a. Explain the biochemistry of bioluminescence
(or)
b. Write an essay on "migration in Birds"

(For the candidates admitted from 2008-2009 onwards)

M.SC. DEGREE EXAMINATION,

Zoology

THIRD SEMESTER

CORE - XI

OPTIONAL SUBJECT - I - APPLIED AND STORAGE ENTOMOLOGY

Time : Three Hours

Maximum : 75 Marks

Part A -(5x5=25 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 250 words. All questions carry equal marks.

1. a. What are the reasons for insects becoming pest?
(or)
b. Bring out the salient features of the order coleopteran
2. a. Name any three pests of groundnut. Add a note on them
(or)
b. Write a brief note on pod borer of pulses
3. a. What are the physical methods of pest management?
(or)
b. Write notes on pheromones
4. a. Organo phosphorus pesticides
(or)
b. Organic pesticides of plant origin
5. a. Write notes on scavengers
(or)
b. Briefly explain the role of insects in medicine

Part B- (5x10=50 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 500 words. ALL questions carry equal marks.

6. a. Bring out the importance of pest surveillance in pest management
(or)
b. Classify the class insecta upto order with suitable examples
7. a. Given an account of pests of sugar cane and cotton
(or)
b. Discuss in detail about the pests of stored products
8. a. Give an account of non – conventional methods of pest management
(or)
b. Discuss the biological control of insect pests
9. a. Write an essay on integrated pest management (IPM)
(or)
b. Give an account of the effects of pesticides on ecosystem
10. a. “Predators and Parasites” – discuss
(or)
b. Give a brief account on beneficial insects

(For the candidates admitted from 2008-2009 onwards)

M.SC. DEGREE EXAMINATION,

Zoology

THIRD SEMESTER

ELECTIVE - III

**AQUIRED IMMUNO DEFICIENCY SYNDROM (AIDS) AND
AWARENESS**

Time : Three Hours

Maximum : 75 Marks

Part A -(5x5=25 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 250 words. All questions carry equal marks.

1. a. What are the Aids related infections?
(or)
b. List out the mode transmission of Aids.
2. a. What are the clinical manifestations of HIV.
(or)
b. How HIV infection is diagnosed?
3. a. Why opportunistic infections occur in Aids patients?
(or)
b. How HIV virus transmitted?
4. a. What are the preventive measures from HIV infection.
(or)
b. Explain rapid assessment of Aids knowledge.
5. a. Explain the importance of counselling for Aids patients?
(or)
b. "Care with humanity and curtesy is the basic requirement of persons with Aids" – discuss.

Part B- (5x10=50 Marks)

Answer **ALL** question choosing either 'a' or 'b' Each answer not exceeding 500 words. **ALL** questions carry equal marks.

6. a. What are the psycho-social impact of Aids?
(or)
b. Explain the epidemiology of Aids.
7. a. Describe structure of HIV virus.
(or)
b. Give an account of Pathology of HIV infection.
8. a. Give a detailed account on opportunistic infections.
(or)
b. What are the secondary disorders associated with AIDs.
9. a. What is the role of ELISA technique in diagnosis of AIDs?
(or)
b. How WESTERN BLOT technique is employed in diagnosis of AIDs?
10. a. Bring out the importance of awareness among human population.
(or)
b. Give an account of AIDs control programmes.

(For the candidates admitted from 2008-2009 onwards)

M.SC. DEGREE EXAMINATION,

Zoology

FOURTH SEMESTER

CORE - XII

EVOLUTION AND TAXONOMY

Time : Three Hours

Maximum : 75 Marks

Part A -(5x5=25 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 250 words. All questions carry equal marks.

1. a. Write short notes on the principles of Darwinism
(or)
b. Briefly explain the theory of biogenesis
2. a. Define biological species concept. Add a note on it
(or)
b. Describe the types of speciation
3. a. What is meant by orthoselection
(or)
b. Critically analyse the future evolution of man
4. a. Explain non adaptive characters
(or)
b. Describe the evolutionary significance of colouration in animals
5. a. Write notes on chemotaxonomy
(or)
b. What is meant by international code of zoological nomenclature

Part B- (5x10=50 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 500 words. ALL questions carry equal marks.

6. a. Write on essay an biochemical origin of life
(or)
b. Describe the mathematical and experimental analysis of section
7. a. Write a detailed account on Hardy – Weinberg law
(or)
b. Give an account on mechanism of speciation
8. a. Differentiate the convergent evolution and divergent evolution
(or)
b. Trace the evolutionary history of man
9. a. Write a detailed account on adaptation and its evolutionary significance
(or)
b. Give an account of animal distribution
10. a. What are the objectives and uses of nomenclature in zoological studies?
(or)
b. What are the different types of keys? Mention their advantages and disadvantages

(For the candidates admitted from 2008-2009 onwards)

M.SC. DEGREE EXAMINATION

Zoology

FOURTH SEMESTER

CORE - XIII

MEDICAL LABORATORY TECHNIQUES

Time : Three Hours

Maximum : 75 Marks

Part A -(5x5=25 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 250 words. All questions carry equal marks.

1. a. How will you prepare glasswares for use in the laboratory?
(or)
b. What are the causes of laboratory accidents
2. a. What is the clinical significance of haemoglobin estimation?
(or)
b. List out the basic haematological techniques in analysis of blood
3. a. Comment on erythrocyte sedimentation rate (ESR)
(or)
b. Write brief notes on Hematocrit and packed cell volume
4. a. How would you find the specific gravity of urine?
(or)
b. What are the clinical significances of estimation of ketone bodies and albumin in urine?
5. a. Comment on the clinical significance of analysis of semen
(or)
b. What is the importance of analysis of faeces

Part B- (5x10=50 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 500 words. ALL questions carry equal marks.

6. a. Give an account of physical method of sterilization
(or)
b. How would you give first aid to common laboratory accidents?

7. a. How would you collect the blood sample for haematological tests? Explain
(or)
b. Write the clinical significance of RBC counting and WBC differential counting

8. a. Wrote notes on
 - i. Bleeding time
 - ii. Clotting time(or)
b. Give an account of haemorrhagic disorders

9. a. What is HCG? How it is related to pregnancy testing
(or)
b. Write about the clinical significance of detection of glucose in urine

10. a. How RIA and ELISA techniques are useful in detection and diagnosis of diseases?
(or)
b. Briefly discuss the role of vectors in transmission of diseases

(For the candidates admitted from 2008-2009 onwards)

M.SC. DEGREE EXAMINATION

Zoology

FOURTH SEMESTER

CORE - XIV

OPTIONAL SUBJECT - II - SERICULTURE

Time : Three Hours

Maximum : 75 Marks

Part A -(5x5=25 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 250 words. All questions carry equal marks.

1. a. Describe the structure of larva of *Bombys mori*
(or)
b. Explain the mouth parts of silk worm with suitable diagram
2. a. List out the biofertilizers
(or)
b. How will you select a land for mulberry cultivation
3. a. What are the different types of appliances used in silkworm rearing?
(or)
b. Describe a typical rearing house
4. a. What are the diapausing and non - diapausing eggs?
(or)
b. Enumerate the materials required for grainage
5. a. Explain the incubation methods of silkworm eggs
(or)
b. What is re - reeling ? Explain book making

Part B- (5x10=50 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 500 words. ALL questions carry equal marks.

6. a. Write an essay on different races of mulberry silkworm
(or)
b. Give an account of non – mulberry silk worms

7. a. Explain the different vegetative propagation methods of mulberry
(or)
b. Describe harvest and preservation of mulberry leaves

8. a. Discuss the different methods used in our country to rear young age silk worms
(or)
b. What are the pest diseases of silk worm. Add a note on their control

9. a. Write an account on the acid treatment of hibernating eggs
(or)
b. What are the procedures followed in a grainage?

10. a. Explain the different stiffling methods of cocoons
(or)
b. Give an account of silk examination and grading of silk

(For the candidates admitted from 2008-2009 onwards)

M.SC. DEGREE EXAMINATION,

Zoology

FOURTH SEMESTER

ELECTIVE - IV

ECONOMIC ZOOLOGY

Time : Three Hours

Maximum : 75 Marks

Part A -(5x5=25 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 250 words. All questions carry equal marks.

1. a. List out the common house hold insects.
(or)
b. What are the insects damaging house hold goods?
2. a. Define apiculture. Briefly explain the social organisation of honey bee.
(or)
b. What are the advances of modern method of apiculture?
3. a. What are the different types of prawn fishery.
(or)
b. How will you prepare a farm for prawn culture?
4. a. Aims of fish culture
(or)
b. Describe hatching pit
5. a. How soil fertility is increased by earthworm.
(or)
b. Explain food and feeding habits of earthworm.

Part B- (5x10=50 Marks)

Answer **ALL** question choosing either 'a' or 'b' Each answer not exceeding 500 words. **ALL** questions carry equal marks.

6. a. Give an account of insects affecting human health.
(or)
b. How food products are damaged by insects?
7. a. Explain the methods of bee keeping.
(or)
b. Give an account of the products of bee keeping.
8. a. Give a detailed account on preservation and processing of prawn.
(or)
b. How marine prawn cultured in farm?
9. a. Write an account of By-products of fishing industry.
(or)
b. What are the different methods of preservation of fish.
10. a. Write an account on vermi composting.
(or)
b. How earth worms playing a major role in organic farming?