Annexure - 11

PERIYAR UNIVERISTY

SALEM – 11

PERIYAR INSTITUTE OF DISTANCE EDUCATION (PRIDE)

M.Sc., ZOOLOGY

REGULATIONS

(Effective from the academic year 2007 – 2008 onwards)

1. Objectives of the course:

The present syllabus is devised with an idea of generating students to avail job opportunities in various fields related to animal sciences.

2. Conditions for admission:

A candidate who has passed B.Sc., Zoology / advanced zoology / animal sciences degree of this university or any of the above degrees of any other university accepted by the syndicate as equivalent thereto, subject to such condition as may be prescribed therefore shall be permitted to appear and qualify for the M.Sc., degree examination of this university after a course of study of two academic years.

3. Duration of the course:

The course for the degree of Master of Science in zoology shall consist of two academic years divided in to 2 years. Each year consists of 180 working days.

4. Course of study:

The course of study shall comprise instruction in the following subjects according to the syllabus and books prescribed from time to time.

I Year

Paper I : Functional morphology of Invertebrates and Chordates, Cell and Molecular Biology and Biophysics.

Paper II : Advanced genetics, Basic concepts of Microbiology and Immunology

Paper III : Biostatistics and Computer applications

Paper IV : Environmental Science and Developmental Biology

Practical I : Relevant to papers I to IV.

100 Marks allotted to

Practical 80

Record 20

II Year

Paper V : Biochemistry

Paper VI : Basic concepts of Biotechnology; Evolution and Taxonomy

Paper VII : Animal physiology and Medical laboratory techniques

Paper VIII : Optional subjects: I – Applied and Storage Entomology and II – Sericulture

Practical II : Relevant to papers V to VIII

100 Marks allotted to

Practical 80

Record 15

Slide box submission 5.

5. Examination:

The examination shall be three hours duration for each paper at the end of each year. The candidate failing in any subject(s) will be permitted to appear for failed subject(s) in the subsequent examination.

Practical examinations for PG course shall be conducted at the end of each year, the duration of which is 4 hours.

6. **Scheme of Examination**

The scheme of examinations for 2 years shall be as follows:

I YEAR

Paper	Title of the paper	Duration	Marks
Paper I	Functional morphology of Invertebrates & Chordates, Cell and Molecular Biology	3 hours	100
Paper II	Advanced Genetics, Basic concepts of Microbiology & Immunology	3 hours	100
Paper III	Biostatistics and Computer applications	3 hours	100
Paper IV	Environmental Science and Developmental Biology	3 hours	100
Practical I	Relevant to papers I to IV.	4 hours	100
	II YEAR		
Paper V	Biochemistry	3 hours	100
Paper VI	Basic concepts of Biotechnology and Evolution and Taxonomy	3 hours	100
Paper VII	Animal Physiology and Medical Laboratory Techniques	3 hours	100
Paper VIII	Optional subjects I – Applied and Storage Entomology, II – Sericulture	3 hours	100
Practical II	Relevant to papers V to VIII	4 hours	100

- For practical I, 100 mark is allotted to Practical (80) + Record (20)
- For practical II, 100 mark is allotted to Practical 80 + Record (15) + Slide box submission (5).

7. Question paper pattern for M.Sc., Zoology course (PRIDE).

Time: 3 hours Maximum: 100 marks

Part – A: (5 x 5 = 25)

Answer all questions

Atleast two questions from each unit with internal choice

Part – B: (5 x 15 = 75)

Answer all questions

At least two questions from each unit with internal choice

8. Passing minimum

The candidate shall be declared to have passed the examination if the candidate secure not less than 50 marks in the University examination in each paper.

For the Practical paper, a minimum of 50 marks out of 100 marks in the University examination and the record notebook taken together. There is no passing minimum for the record notebook. However, submission of a record notebook is a must.

Candidate who does not obtain the required minimum marks for a pass in a paper shall be required to appear and pass the same at a subsequent appearance.

9. Classification of Successful Candidates:

Candidates who secure not less than 60% of the aggregate marks in the whole examination shall be declared to have passed the examination in **First Class.**

All other successful candidates shall be declared to have passed in the **Second Class.**

Candidates who obtain 75% of the marks in the aggregate shall be deemed to have passed the examination in **First Class with Distinction** provided they pass all the examinations prescribed for the course at the first appearance.

Candidates who pass all the examinations prescribed for the course in the first instance and within a period of two academic years from the year of admission to the course only are eligible for **University Ranking**.

10. Maximum Duration for the completion of the PG Programme:

The maximum duration for completion of the PG Programme shall not exceed 2 years.

11. Commencement of this Regulation:

These regulations shall take effect from the academic year 2007 – 08, i.e., for students who are to be admitted to the first year of the course during the academic year 2007 – 08 and thereafter.

12. Transitory Provision:

Candidates who were admitted to the PG course of study before 2007 – 08 shall be permitted to appear for the examinations under those regulations for a period of three years i.e., up to and inclusive of the examination of April / May 2010. Thereafter, they will be permitted to appear for the examination only under the regulations then in force.

13. Syllabus with effect from: 2007 – 2008 onwards.

PERIYAR UNIVERSITY, SALEM – 11

M.Sc., Branch VI – ZOOLOGY

(Effective from the academic year 2007 – 2008 onwards)

PAPER - I: FUNCTIONAL MORPHOLOGY OF INVERTEBRATES AND CHORDATES, CELL & MOLECULAR BIOLOGY AND BIOPHYSICS

Unit I:

Origin and evolution of Metazoa - Theories - Symmetry and its significance in animal organization - Interrelationship between different phyla - Echinodermata phylogeny and evolution.

Unit II:

Origin of paired fins & limbs origin and evolution of invertebrates - Adaptive radiation of elasmobranchs and bony fishes - Terrestrialization of amphibia - Evolution of reptiles - Origin and evolution of birds - Connecting links between Reptiles and birds - Origin of mammals - Comparative anatomy of chordates, integumentary system, Urinogenital system, heart and aortic arches, brain & urinogenital system.

Unit III:

DNA and RNA - Structure, types & functions - Replication of DNA - DNA Repair mechanism - Gene action and protein synthesis - Biology of aging and cancer cells.

Unit IV:

Microscopy (Compound - Phase contrast - Electron (TEM & SEM) Microscopy) - Colorimetry - Spectrophotometry (Visible, UV, IR) - Centifuge (Ultra - centrifuge) - Electrophoresis (PAGE) - Chromatography (TLC)

Unit V:

Properties of Natural light - Biological applications of X rays, 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). BARRINGTON, E.J.W. (1979), **Invertebrate structure and functions**, II Ed., ELBS and Nelson.

2). WATERMAN, A.J. (1971), **Chordate structure and function**, the Macmillan company.

3). De ROBERTIS, E.D. P and De ROBERTIS, E, M, F, (1987), **Cell and Molecular Biology**, Lea and Febiger, VIII edition filadelphia.

4). POWAR, C.B (1983), **Cell Biology**, Himalaya Publishing House, Bombay.

5). NARAYANAN, P. (2003), **Essentials of Biophysics**, New Age International (P) Limited, Publishers, New Delhi.

REFERENCE BOOKS

1). MOORE, R.C. LOLICKER and FISCHER, A.G. (1952), **Invertebrate palaentology**, McGraw Hill Book Co., Inc. New York.

2). COLBERT. H.EDWIN (1989), **Evaluation of vertebrates**, Wiley Eastern Limited, New Delhi.

3). HARREY POUGH, JOHN. B.HEISHER, WILLIAM. N. McFARLAND, (1990), **Vertebrate life**, Macmillan Publishing co., New York.

4). KARP, G. (1996), **Cell and Molecular Biology - Concept and Experiments**, John Wiley & Sons, Inc. New York.

5). DANIEL.M (2004), **Basic Biophysics**, Saraswathi Purohit for Student Edition, Jodhpur, India

6). VASANTHA PATTABHI and N. GAUTHAM (2005), **Biophysics**, Narosa Publishing House, New Delhi.

7). PAPER II: ADVANCED GENETICS, BASIC CONCEPTS OF MICROBIOLOGY AND IMMUNOLOGY

Unit I:

Gene and metabolic pathways - Metabolic block in Drosophila (eye pigmentation) Inborn errors of metabolism in man - Haemoglobin disorders - Sickle cell anemia and thalessemia Human karyotype preparation and chromosomal syndromes in man – (Down's, Turners' and Klinfelter's syndromes).

Unit II:

Genetics of races and species formation - genetic load - genetic polymorphism - Evolution of sex chromosomes - Dosage compensation – X inactivation - genomic imprinting.

Unit III:

Application of genetics in plant and animal breeding - Application of genetics in crime & law - DNA finger printing - Genetic basis of intelligence - Studies on twins.

Unit IV:

Morphology - Types - Cell wall of gram positive and gram negative bacteria - Structure and life cycle of DNA (T_4 phase) and RNA Virus (HIV) and bacteria (eg. Lysogenic and Lytic cycles) - Sterilization techniques - Culture of bacteria - Types of media and conditions for culturing.

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 Cholera, (Balantidiam, Streptococcus, Staphylococcus).

Unit V:

Cells of immune systems - Origin and differentiation of T, B cells and macrophage - Antigens - Class determimants - Relative sites and receptor site.

Vaccines - Types - Mode of action and vaccines for various diseases. Antibody - Immunoglobulin - Types - Subtypes - Properties and functions.

Major histocompatibility complex (MHC) and its products in man. Disease and immune response - Viral bacterial diseases parasitic infections - Tumour immunology Immune deficiency diseases - AIDS.

Auto immune diseases - examples

Types of hypersensitivity - concept (Type I - IV).

TEXT BOOKS:

1). SINNOT, E.W., DUNN, & LC. DOBZHANSKY, T.H. (1958), **Principles of Genetics**, McGraw Hill Co., New York.

2). ANANTHANARAYANAN T. and JAYARAMAN PANICKER. C.K. (2000), **Text Book of Microbiology**, VI Ed., Orient Longman Ltd., Madras.

3). LEVINE, R.P. (1968), **The Science**, Holt Ruinhart & Winston, New York.

4). JOHN, D. HAWKINS (1996), **Gene structure and expression**, III Ed. Cambridge university press.

5). PRESSCOTT. L.M. HARTEY, P.KLEIN J. (1990). **Microbiology** U.M.C. Brown Publishers.

REFERENCE BOOKS:

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). BURNS, G.W. (1969). **The Science of Genetics.** The Macmillam Company, New york.

3). STICKBERGER MANORE.W. (1996), **Genetics,** Prentice hall of India Pvt.Ltd.

4). MICHAEL PELCZER J. PELCZAR, E.C.S. CHAN. NOEL R.KRIEG, 5th Edition, (1993) **Microbiology**, Tata- McGraw Hill Edition.

5). POWAR, C.B. AND DAGNTWALA, H.F. (1992). **General Microbiolgy,** Vol.I and II, Himalaya Publishing House, Bombay.

6). DAVID FRIEDFELDER (1998), **Microbial Genetics,** Narosa Publishing House, New Delhi.

PAPER-III: BIO STATISTICS AND COMPUTER APPLICATIONS

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 – mode. Measures of dispersion : Standard deviations and standard errors – co-efficient of variance.

Probability distribution – Binomial and Poisson distributions – Student 't' Test – estimation and hypothesis. Test of significance – small samples and large samples-X^2 distribution and its uses.

UNIT-III: CORRELATION AND REGRESSION

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 – Number system (Basic Concept only) – memory units – Input and output devices – Auxillary storage devices.

UNIT-V: COMPUTER APPLICATIONS:

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

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.

3. ALEXIS LEON and MATHEWS LEON (1998), **Fundamentals of Computer Science and Communication Engineering**, Leon Techword, Chennai.

4. RAJARAMAN.V (1992), **Fundamentals of Computers**, 8th Edition, Prentice – Hall of India Private Limited, New Delhi.

REFERENCE BOOKS:

1. SOKAL.R and JAMES.F (1973), **Introduction to Biostatistics**, W.H.Freeman and Company Ltd., Tokyo, Japan.

2. PRANAB KUMAR BANERJEE (2004), **Introduction to Biostatistics**, S.Chanel and company Ltd., New Delhi.

3. PILLAJ, R.S.N and BAGAWATHI,V (1989), "**Statistics Theory and Practice**", S.Chanel & Co. Ltd., New Delhi.

4. GUPTHA.S.P. (1988), "**An Easy Approach to Statistics**",S.Chand & Co., Ltd., New Delhi.

5. RAJARAM.R (1998), **Basic Computer Science and Communication Engineering,** Sci Tech Publications, Chennai-87.

6. MORRIS MANO.M (1988), **Computer system Architecture**, II Edition, Prentice – Hall of India private Ltd., New Delhi-110 001.

7. THAMSA BARTEE.C (1987), **Digital computer fundamentals**, 6th Edition, McGraw – Hill Book Company, Newyork.

8. SUBRAMANIAN.N.(1986) "**Introduction to Computers**", Tata McGraw – Hill Publishing Company Limited, New Delhi.

9. RAM.B.(1977), "**Computer Fundamentals – Architecture and Organization**", 2nd Edition, New Age International (p) Ltd., Publishers, New Delhi.

10. ALEXIS LEON and MATHEWS LEON (1999), "**Fundamentals of Information Technology**" Leon Vikas, Chennai.

PAPER-IV: ENVIRONMENTAL SCIENCE AND DEVELOPMENTAL BIOLOGY

UNIT-I:

Ecosystem – Natural and man-made ecosystems with examples – Energy flow – Pyramids, food-chain and food-web – Productivity – Ecological efficiencies.

Natural Resources – Renewable – Forest management – Deforestation and Aforestation – Protection of wild-life resources – Conservation projects.

Energy Resources – Non-Renewable resources (mineral) - Conventional (Coal, petroleum) – Renewable – Non-conventional (Solar, wind) – Conventional – Hydel, tidel powers, salinity, energy, geothermal and nuclear Power – Programmes in India.

UNIT-II:

Pollution And Management - Sources, effects and control of air, soil and water pollution – Heavy metals – Ground water and marine pollution – Noise pollution – Radio active pollution – Bioaccumulation – Biomagnification.

Environmental Education – Principles, Programmes and status in India – Environmental organization and agencies – International bodies – Man and Biosphere programme (MAB) – Department of Environment.

UNIT-III:

Gametogenesis - Ultrastructural organization of mammalian spermatozoa and egg – Nuclear activities during Oocyte growth.

Fertilization – Sperm – Egg interaction – Gamete fusion – Activation of egg – Metabolism.

Cleavage – Patterns and factors influencing cleavage – Chemical changes – Polarity and gradient.

UNIT-IV:

Gastrulation – Morphogenetic movements – Fate maps – Principles, patterns and physiology of gastrulation. (Amphioxus, Amphibian, Chick and mammal)

Organogenesis – Eye, Heart, Kidney and Brain.

UNIT-V:

Foetal Membranes & Placenta – Classification and Physiology.

Metamorphosis – Morphological and biochemical changes during metamorphosis – Hormonal control of Amphibian metamorphosis.

Regeneration – Regeneration as developmental phenomenon - Polarity and gradient in regeneration.

Experimental Developmental Biology – Chemical basis of gene action in development - Genes and differentiation – Regulation of gene action – Information genes and development – Inductors and organizers – Genes and organizers.

TEXT BOOKS:

1. AGARWAL.K.C. (1999) **Environmental Biology,** Published by Agro Bolancia, 4.E, 176, J.N.Vyas Nagar, Bikaner, India.
2. ODUM.E.P. (1966) **Fundamentals of Ecology** (III Edn), Nataranj Publishers, Dehradum.
3. CASTRI.F.D and YOUNES.T (1996) **Biodiversity**: Science and Development Cab Int., Wallingford, UK.
4. BALINSKY.B.L. (1981) **An introduction to Embryology**, V.Ed., Saunders Co., Philadelphia.
5. BERRILL.N.J. (1986) **Developmental Biology**, Tata McGraw Hill, New Delhi.

REFERENCE BOOKS:

2. CHAPMAN.J.L. and REISS.M.J (1997), **Ecology:** Principles and Applications, Cambridge University Press, UK.
3. CLARK.GL. (1963) **Elements of Ecology**, John Wiley and Sons, Inc., Newyork.
4. GHOSH.G.K. (1992) **Environmental Pollution**, Ashish, Publishing house, New Delhi.
5. SHARMA.B.K. and KAUR.H (1997), **An introduction to Environmental Pollution**, Goel Publishing House, Meerut.
6. SIMMONS.I.G. (1981). **The ecology of natural resources** (II Edn.) EDWARD Arrold Publishers Ltd., Bed ford square, London.
7. MUNN.R.E. (1975) **Environmental impact assessment, principles and procedures**, John Wiley and Sons, Toronto.
8. AHMAD.Y.J. and SAMMY.G.K (1985). **Guidelines to environmental impact assessment in developing countries**, Hodder and Stoughton, London.
9. BERRIL.N.J. AND KARP.G (1976) **Developmental Biology**, McGraw Hill Inc. New York.
10. BROWDER.L.N. (1980) **Development Biology**, Saunders College, Philadelphia.
11. EBER.J.D. (1970), **Interacting System in Development**, Holt Rein Chart and Winston, Inc. New York and Chicago.
12. DEUCHAR.E.M. (1976) **Cellular interaction in Animal Development**, Chapman and Hall, London.
13. GILBERT.S.E. (1995) **Developmental Biology**, II Edn, Sinamer Associates Inc., Publishers, Saunderland, Massachusetts, USA.

PAPER-V: BIO-CHEMISTRY

UNIT I : INTRODUCTION

Scope – Atoms, Molecules, Polymerization of organic Molecules – Nature of living matter, major organic components – Chemistry of water – dissolved gases – pH, buffers – Membrane permeability.

BODY BUILDERS AND ENERGY PRODUCERS

Structure, Classification and functions of proteins, carbohydrates, lipids and nucleic – acids – Derivatives of carbohydrates and lipids.

UNIT II : ENZYMES

3-D Structure, classification and functions – 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 – Theories of oxidation of fatty – acids.

BMR – Inborn errors of metabolism.

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, magnesium and other trace elements as Iodine, copper, zinc 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.

3. COOPER.T.G.(1977), The tools of Biochemistry, Wiley Inter science Publication, John Wiley & Sons; NY.

REFERENCE BOOKS

1. ROBERT K.MURAY, DARYL K.GRANNER, PETER A.WAYES and VICTOR W.RODWELL (1993), Harper's Biochemistry (24th Edition) Prentice Hall International Inc., London.

2. VOET.D. AND VOET.J (1995), Biochemistry, John Wiley & Sons, New York.

PAPER VI: BASIC CONCEPTS OF BIOTECHNOLOGY AND EVOLUTION AND TAXONOMY

UNIT I: HISTORICAL BACKGROUND AND TECHNIQUES OF GENETIC ENGINEERING

Biotechnology: Definition – Scope – Importance – Major areas of Biotechnology.

Genetic engineering: Vectors – Major steps involved – rDNA technology.

Tissue culture technology: Cell culture – Organ culture – Embryo technology – Invitro fertilization – Embryo transfer – Embryo splitting.

UNIT II: INDUSTRIAL BIOTECHNOLOGY

Fermentation technology: Bioreactor – Process – Requirements – Primary and secondary metabolites (Lactic acid, alcohol, vitamins, penicillin and vinegar).

Food biotechnology: Single cell protein (SCP) – Production (bacterial, algal and fungal).

Enzyme biotechnology: Properties – Free enzymes – Their applications – Immobilization – Definition – Methods – Their applications.

UNIT III: APPLIED BIOTECHNOLOGY:

Application of rDNA technology in the production of vaccines, hormones, monoclonal antibodies – Transgenesis in plants and animals – Gene therapy – DNA finger printing.

UNIT IV: SPECIATION AND PATTERNS OF EVOLUTION AND ADAPTATION

Speciation: Species concept – Mechanism – Factors - Evolutionary rates and punctuated equilibrium – Hardy Weinberg Law and Evolution. Patterns of evolution – Geological time scale, organic evolution at human level, future evolution – Divergent evolution – Convergent evolution – Micro, macro and mega evolution.

Adaptation: Adaptation and Evolution – Coloration of animals – Non adaptive characters – Animal distribution – Evolutionary significance

UNIT V: TAXONOMY:

Nature of international code of zoological nomenclature – Principles relating to nomenclature – Taxonomic keys – Objectives and uses in Zoological studies – Chemotaxonomy – Molecular evolution – Gene evolution - Molecular drive.

TEXT BOOKS:

1. IGNACHIMUTHU, S (1998), **Basic Biotechnology**, Tata McGraw Hill publishing Co., New Delhi.
2. DUBEY, R.C. (2001), **A textbook of Biotechnology**, Rajendra Printer, New Delhi.
3. DODSON, E.V. (1960), **Evolution process and product**. East West press, New Delhi.
4. KAPOOR, V.C. (1986), **Theory and practice of animal taxonomy**. Oxford & IBH Publishers Co., New Delhi, Bombay, Calcutta.

REFERENCE BOOKS:

1. MERRELL. D.P. (1962), **Evolution and Genetics**, **The modern theory of evolution**. Hdt Dein hart and Winston N.Y.

2. CENTER, G.S. (1951), **Animal evolution**, Sedgwick and Jacson Ltd., London.

3. CANNON, H.G. (1958), **The evolution of living things**. Manchester University press.

4. FLORKIN, M. (1948), **Biochemical Evolution**, Academic Press.

5. HUXLEY, J. (1955), **Evolution: The modern synthesis**, George Allen and Unwin Ltd., London.

6. MONROCE W. STICKBERGER (1994), **Evolution**. University of Missouri. St. Laus C.B.S. Publishers, Delhi – 32.

7. ERNST MAYR (1969). **Principles of systematic Zoology**, TMH edition. Tata McGraw Hill publishers Co., Ltd., Bombay & New Delhi.

PAPER VII: ANIMAL PHYSIOLOGY AND MEDICAL LABORATORY TECHNIQUES

UNIT I: NUTRITION, RESPIRATION, CIRCULATION AND EXCRETION:

Nutrition: Carbohydrates, Proteins and Lipids – Physiology of absorption.

Respiration: Types of respiratory mechanisms (Integumentary, bronchial, tracheal and pulmonary) – Physiology of respiration in man – Respiratory pigments and their role in oxygen and carbon dioxide transport in men.

Circulation: Control of heart beat – Cardiac cycle – Electrocardiogram (ECG) - Coagulation of blood – Haemodynamics

Excretion: Patterns of excretion in relation to environment – Physiology of excretion in man – Regulation of excretion.

UNIT II: CO-ORDINATION (NERVOUS AND ENDOCRINE) AND MUSCLE PHYSIOLOGY:

Nervous co-ordination: 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 coordination – Molecular mechanism of hormone action.

Muscle physiology: Molecular structure – Chemical composition – Mechanism of muscle contraction – Regulation of energetic of muscle contraction.

UNIT III: SENSORY PHYSIOLOGY AND BIOLUMINESCENCE:

Sensory physiology: Receptors – Classification and Functions – Mechanism of hearing – Physiology of vision in man.

Biolumeniscence: Types – Chemical and Physical aspects – Functional significance.

UNIT IV: LABORATORY SAFETY AND INSTRUMENTATION AND TECHNIQUES OF STERILIZATION:

Laboratory: Accidents – Universal work precautions (UWP) for lab personnel (especially in relation to HIV) – Laboratory instruments – Special applications of the microscope (Electron microscope – Centrifuge and other necessary equipments).

Techniques of sterilization: Introduction – Sterilization by Heat – Cold – Ultra violet radiation - Ionizing radiation – Filtration – Chemical sterilization – Glass ware preparation for use.

UNIT V: HAEMATOLOGICAL TECHNIQUES AND CLINICAL ANALYSIS:

Haematological techniques: Collection of blood samples – Analysis of blood and basic haematological techniques - Blood cell morphology in health and disease – RBC, WBC, (total count) and differential count, Haematocrit, PCV, MCH, MCHC, MCV, ESR, RBC - Fragility test – Platelet count – Reticulocytocrit – Haemorrhagic disorders – Clotting time - Bleeding time - Prothrombin time - Test for deficiency in blood clotting factors

Clinical analysis: Analysis of urine – Regular analysis of faeces, semen, CSF.

Examination of parasites relevant to human health (Protozoans and helminthes – Each 3) RIA, ELISA, Western Blot Techniques and WIDAL test.

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

REFERENCE BOOKS:

1. BENTLEY (1971), **Endocrine and Osmoregulation**, Springer – Werley, N.Y.
2. ECHERT, R and RANDALL, D. (1987), **Animal Physiology**, CBS Publishers & Distributors.
3. GIESE, A.C. (1979), **Cell Physiology and Biochemistry**, Prentice Hall.
4. GORDON, M.S. BARTHOLOMEW, G.A., GRILNELL, A.D., JORGENSEN, C.B. and WHITE F.N. (1971), **Animal Function**, **Principles and Adaptations**, Mac Millan Co., London.
5. ROBERT M. BERINE and M.N. LEVY (1988), **Physiology**, 3rd Edition, St. Louis, Baltimore, Boston.

6. SCHMIDT NEILSSON, K. (1985), **Animal Physiology, Adaptation and Environment**, CUP, London.

7. BOMFORD, MASON and SWASH (1975), **Hutchinson's Clinical Methods**, Beilliers Tindal (ELBS Edition), 362pp.

8. SAMUEL, K.M., **Notes on Clinical Lab. Techniques**, MKG Iyer and Sons, Madras.

9. SWARUP, PATHAK and ARORA (1981), **Laboratory Techniques in Modern Biology**, Kalyani Publishers, New Delhi.

10. MATHUR and GARG (1975), **Laboratory Manual for General practioners and Health centres**, Pragati prakashan, Meerut, 256pp.

PAPER VIII:

OPTIONAL SUBJECTS I: APPLIED AND STORAGE ENTOMOLOGY II: SERICULTURE

UNIT I: PEST SURVEILLANCE AND INSECT PESTS OF CROPS AND THEIR MANAGEMENT:

Pest surveillance: Reasons for insects becoming pests – Types of damage caused by insects – Pest surveillance – Forecasting and monitoring – Population dynamics – Insect population assessments.

Insect pests of crops and their management: Pests of cereals (Rice, Wheat and Maize) - Pests of commercial crop (sugar cane) - Pests of pulse (Red gram) - Pests of oil seed (groundnut) - Pests of fibre crop (cotton) - Pests of fruit (mango) and vegetables (solanaceae).

Pests of stored products: Sources of infestation – Internal and External feeders – Control and Management.

UNIT II: PRINCIPLES AND METHODS OF PEST MANAGEMENT:

Natural and applied / Artificial methods: Conventional methods (prophylactic, curative, cultural, physical, legal and biological) - Non conventional methods (Plant Products – Chemosterilants – Antifeedants – Pheromones – Insect repellants – Attractants).

Chemical methods: Pesticides – Classification – Factors affecting toxicity of pesticides – Insecticide resistance to insects and methods to reduce it. Effects of pesticides on ecosystem – Environmental safety.

Integrated pest management (IPM): Methods – Components – Need for IPM – Uses.

UNIT III: INSECTS RELATED TO HUMAN WELFARE AND HEALTH AND HOUSEHOLD MATERIALS AND THEIR MANAGEMENT:

Insects related to human welfare: Beneficial insects (Honey bee, silk worm - Cochineal insects) – Insect galls – Insects in medicine – Helpful insects – Predators – Parasites – Weed killers – Soil builders – Scavengers.

Insects related to public health and house hold materials: Insects related to public health (Mosquitoes, bed bug and human body louse) – Their control and management. Insects related to house hold materials (ants, termites, silver fish, cockroach and cloth moths) – Their control and management.

UNIT IV: MULBERRY CULTIVATION, GENERAL ASPECTS OF SILK WORMS AND SILK WORM REARING:

Mulberry cultivation: Land Selection – Varieties – Methods of planting – Maturing (Organic and Inorganic) – Pruning – Shoot thinning – Harvest and preservation of leaves – Quality of leaves of mulberry for different stages – Pests and diseases of mulberry and their control measures.

Silk worms: Types (Tasar, mulberry, Mega and Eri) – Morphology and life cycle of silk worms – Races of mulberry silkworms – Voltinism.

Rearing of silkworm: Rearing houses and Appliances – Disinfection – egg transportation and incubation – Egg handling – Hatching – Brushing – Silk worm rearing techniques (young age and late age) – Rearing environmental conditions – Spacing and leaf requirement in different stages – Spinning and mounting (Types of mountages) – Harvesting of cocoon and cocoon assessment – Transportation and marketing.

UNIT V: GRAINAGE TECHNIQUES AND SILK REELING:

Grainage technique: Egg production – Hibernation – Acid treatment of hibernating eggs – Loose egg production – Grainage techniques – Materials required for a grainage.

Silk reeling: Reeling methods – Re-reeling – Silk examination – Cleaning, lacing, skeining – Book making – Grading of silk.

TEXT BOOKS:

1. VASANTHARAJ DAVID, B, MURALI RANGAN. M.C. MEERA MURALI RANGAN (1992), **Harmful and beneficial Insects**, Popular Book Depot, Chennai.
2. vasanthraj david, b. (2001), **Elements of Economic Entomology**, Popular Book Depot, Chennai.

REFERENCE BOOKS:

1. NAYAR, K.K. ANATHAKRISHNAN, T.N. and DAVID, B.V. (1986), **General & Applied Entomology**, Tata McGraw Hill publishing company Ltd., New Delhi.
2. EVANS, J.W. (1987), **Insect pests and their control**, Soni Reprints agency, Delhi.
3. DAVID, B.V. and KUMARASWAMY, T. (1998), **Elements of Economic Entomology**, popular book depot, Chennai.
4. DRANZ, J.H. SCHMUTTEREN and KOCH. W, (1977), **Diseases, Pests and Needs in tropical crops**, Verlag Paul Parey, Berlin.

5. WEBSTER, H. SILL Jr. (1982), **Plant protection – an Integrated Interdisciplinary approach**, the IOWA university press Amos, IOWA.

6. CARTER, W, (1973), **Insects in relation to plant disease**, John Wiley and sons, New York.

7. MET CALF, C.V. and FLINT W.P. (1979), **Destruction and useful insects. Their habits and control** – Tata McGraw Hill Publication and Co., New Delhi.

8. SREERAMA REDDY, G (1998), **Silkworm Breeding**, Oxford and IBH publishing co. Pvt. Ltd., New Delhi and Calcutta, pp 354.

9. YASUJI HAMAMURA (2001), **Silkworm Rearing on Artificial Diet**, Oxford and IBH publishing co. Pvt. Ltd., New Delhi and Calcutta.

10. MAHADEVAPPA, D. HALLIYAL, V.G. SANKAR, D.G. and R. BHANDIWAD (2000), **Mulberry Silk Reeling Technology**, Oxford and IBH publishing co. Pvt. Ltd., New Delhi and Calcutta.

11. DANDIN. S.B (2003), **Advances in Tropical Sericulture,** NASSI, Bangalore, India, pp 1-600.

12. WIGGLESWORTH V.B (1974), **Insect Physiology**, Toppan Co. Ltd.

PRACTICAL I: RELEVANT TO PAPERS I TO IV

1. Dissection of nervous system of prawn.
2. Dissection of aortic arches in frog.
3. Micrometry: Simple micrometric measurements of cells (diameter & height of cells).
4. Preparation of culture medium and culture of Drosophila – Methods of maintenance of Drosophila - Identification of mutans (wing & eye).
5. Identification of Human blood groups (ABO and Rh)
6. Squash preparation of Giant chromosomes (salivary gland of drosophila larva / chironomous larva)
7. Study of clinical and veterinary importance of Microorganisms (Bacteria, virus & protozoa)
8. Determination of amino acids in the body fluid of animals using paper chromatography (Cockroach / Grasshopper / Frog liver & muscle).
9. Hydrobiological studies of water samples with special reference to pollution – productivity (O_2, free Co_2, salinity and alkalinity & pH).
10. Blastoderm mounting of chick (Vital & Permanent mount).
11. Development of vertebrate eggs (Cleavage – blastula gastrula).
12. Submission of record.

PRACTICAL II – RELEVANT TO PAPERS V TO VIII

1. Qualitative study of digestive enzymes in cockroach.
2. Determination of rate of salt loss and salt gain in a fish using different media.
3. Qualitative analysis of excretory products (Ammonia, urea & Uric acid).
4. Preparation of Key for the identification of insects.
5. Study of various pests of paddy, sugar cane, cotton, pulses, vegetables, fruits and stored products (any five).
6. Blood – Total counting of RBC, WBC and differential counting of WBC. – Clotting time, bleeding time.
7. Assessment (quality) of leaves for feeding different stages of silk worm larvae.
8. Dissect and display the silk gland of *Bombyx mori* (V instar larva).
9. Micro technique
    a. Spreading of serial sections.
    b. Preparation of permanent mount of serial sections.
10. Submission of slide box.
11. Submission of Record.

MODEL QUESTION PAPERS

(For the Candidates admitted from 2007-2008)

M.Sc. DEGREE EXAMINATION

NON SEMESTER - FIRST YEAR – ZOOLOGY

PAPER I: FUNCTIONAL MORPHOLOGY OF INVERTEBRATES AND CHORDATES

CELL & MOLECULAR BIOLOGY & BIOPHYSICS

Time: 3hrs Max. Marks : 100

Part – A (5x5=25)

Answer ALL questions

1. a) Define symmetry with suitable examples

   Or

   b) Give and account of interrelationship between Annelida andArthopoda

2. a) Archeopterix

   Or

   b) Limulus

3. a) Nucleotides

   Or

   b) Genetic code

4. a) tRNA

   Or

   b) TLC

5. a) X ray differaction

   Or

   b) Autoradiography

PART – B (5x15=75)

Answer ALL questions

6. a) Give and account of various theories that explain the origin and evolution of Metazoa

Or

b) Write an essay on phylogeny and evolution of Echinoderms.

7. a) Give an account of origin of paired fins and limbs.

Or

b) Compare the brain of Calotes with that of a mammal.

8. a) Describe DNA replication in detail.

Or

b) Write about Cancer cells in detail.

9. a) Compare Phase contrast microscope and its functions with that of Electron microscope.

Or

b) Write an essay on the principle and working mechanism of Electrophoresis

10. a) Evaluate the biological application of X-rays, UV rays and Infra red rays.

Or

. b) Write an essay on Centrifuge, its principles, types and functions.

(For the Candidates admitted from 2007-2008)

M.Sc. DEGREE EXAMINATION

FIRST YEAR – ZOOLOGY

PAPER II: ADVANCED GENETICS, BASIC CONCEPTS OF MICROBIOLOGY & IMMUNOLOGY

Time: 3hrs Max. Marks : 100

Part – A (5x5=25)

Answer ALL questions

1. a) Phenylketoneuria

   Or

   b) Klinfelter's syndrome

2. a) Genetic load

   Or

   b) Barr body

3. a) Inbreeding

   Or

   b) Heterosis

4. a) T_4 bacteriophage structure

   Or

   b) Polio virus

5. a) Immunoglobins

   Or

   b) Describe AIDS

PART – B (5x15=75)

Answer ALL questions

6. a) Give and account of metabolic block in Drosophila with reference to its eye pigmentation.

Or

b) How will you prepare a human karyotype and identify it for various syndromes?

7. a) What is the role of isolation in the formation of races and species. Example.

Or

b) Write an essay on genomic imprinting

8. a) How can we apply genetics in the field of animal and plant breeding.

Or

b) What is DNA finger printing? What are the significances?

9. a) Give an account of various types of sterilization techniques.

Or

b) Write an essay on bacterial recombination.

10. a) Give an account of various types of vaccines and explain their mode of action.

Or

. b) Write an essay on various types of hypersensitivity.

(For the Candidates admitted from 2007-2008)

M.Sc. DEGREE EXAMINATION

FIRST YEAR – ZOOLOGY

PAPER-III: BIO STATISTICS AND COMPUTER APPLICATIONS

Time: Three hours Maximum: 100 marks

PART-A (5 x 5 = 25 MARKS)

Answer ALL questions

1. a) What is statistics? Give its applications in Biology.

(or)

b) Define primary data and explain the different methods of collection of primary data.

2. a) Calculate the mean, median and mode for the following data.

No.of Children/family	: 0	1	2	3	4	5	6
No.of families	: 7	7	10	5	3	2	1

(or)

b) Explain the different applications of chi-square test in biological studies.

3. a) Give an account of the study of correlation and regression in biological data.

(or)

b) Explain the statistical significance of probability in the study of biology.

4. a) Give a comparative account of the various generations of computers.

(or)

b) Explain how digital computers are classified.

5. a) Give a brief account on the development of computer software.

(or)

b) Explain the use and application of WORD in documentation.

PART-B (5 x 5 = 75 MARKS)

Answer ALL Questions:

6. a) Draw the tridimensional graph for the following data. The yield of crop in tonnes from 2000-2003 is as follows"

Year	Wheat	Paddy	Pulses
2000	17	12	14
2001	21	17	19
2002	29	17	13
2003	30	12	9

(Graph to be used)

(or)

b) Draw a histogram, frequency polygon and cumulative frequency curve for the following data given below.

Humidity range :	4.1-6.0	6.1-8.0	8.1-10.0	10.1-12.0	12.1-14.0
Frequency cms :	5	8	7	10	12

(Graph to be used)

7. a) What is standard deviation and standard error and their significance in the study of biology. Find the standard deviation and standard error for the following data.

X	:	16	17	18	19	20
f	:	15	20	25	15	10

(or)

b) What is coefficient of variation? What is its use? The statistics on the length and weight of 20 catfishes are given below.

Statistics	Length	Weight
Mean	67.2mm	137.5 gm
Standard deviation	2.68mm	13.37 gm

Which of these two variables is less consistent and why?

8. a) Calculate the regression equation (y on x) for the length breadth of fishses given. Find the calculated breadth of a fish of length 20cm.

Length cm (x)	Breadth(y)
12	7
15	8
10	6
24	12
25	13
17	9

(or)

b) Find the correlation between salinity and dissolved oxygen data given below. Find the level of significance and explain the type of correlation you got.

Salinity % (x)	Dissolved O_2 (ml)
10	7
12	7.5
15	6.4
20	6.0
24	4.2
35	3.5

(at df, 5, for $P<0.05$ table value of x=0.754)

9. a) Give an account of various types of computer outputs.

(or)

b) Elaborate the auxiliary storage devices for direct and sequential access of data..

10. a) Write short notes on

i) FORTRAN

ii) COBOL

iii) BASIC

iv) C LANGUAGE.

(or)

b) Give a detailed account on computer applications in science and technology.

(For the Candidates admitted from 2007-2008)

M.Sc. DEGREE EXAMINATION

FIRST YEAR – ZOOLOGY

PAPER IV: ENVIRONMENTAL SCIENCE AND DEVELOPMENTAL BIOLOGY

Time: Three hours Maximum: 100 marks

PART-A (5 x 5 = 25 MARKS)

Answer ALL questions

1. a) Define food chain. Write notes on food chain in an aquatic ecosystem.

(or)

b) What is solar thermal technology? Add a note on solar thermal programmes in India.

2. a) Describe the effects of heavy metal (any two) pollution in an aquatic system.

(or)

b) What are the goals and objectives of environmental education?

3. a) Write a brief note on nuclear activities during Oocyte growth.

(or)

b) 'The amount of deposition of yolk affects the cleavage pattern and blastula formation' – Justify this statement.

4. a) Write about the nucleocytoplasmic interactions in Morphogenesis.

(or)

b) Give a brief account of the inductive interaction in the development of heart.

5. a) What is placenta? Briefly describe its composition and classification.

(or)

b) Explain polarity and gradient in regeneration.

PART-B (5 X 15 = 75 MARKS)

Answer ALL questions

6. a) Define Primary productivity. Describe different methods of measurement of primary productivity.

(or)

b) Explain the causes of deforestation and their management

7. a) Define pollution. Explain the ecological effects of water pollution in man and aquatic organisms.

(or)

b) Give an account of environmental education in India.

8. a) Discuss the ultrastructural organization of the egg with reference to egg membrane and egg cytoplasm.

(or)

b) Describe with well illustrated diagrams the major events that occur in the process of fertilization.

9. a) What do you understand by Morphogenetic movements? Describe briefly the different types of morphogenetic movements during gastrulation

(or)

b) Give an account of the principles and physiology of Gastrulation in chick.

10. a) Enumerate the Morphological and Biological changes during metamorphosis.

(or)

b) Give an account of Chemical basis of gene action in development.

(For the Candidates admitted from 2007-2008)

M.Sc. DEGREE EXAMINATION

FIRST YEAR – ZOOLOGY

PAPER IV: BIO CHEMISTRY

Time: Three hours Maximum: 100 marks

PART-A (5 x 5 = 25 MARKS)

Answer ALL questions

1. a) Write a brief account on the major elements that contribute to living material and their importance. List the major biopolymers and their composition.

(or)

b) Define pH. Explain the physiological importance of buffers.

2. a) Write notes on Michaelis – Menten bypothesis of enzyme action.

(or)

b) Explain, with examples, the functions of coenzymes.

3. a) Explain briefly the metabolic and the hormonal mechanism of regulating blood glucose concentration.

(or)

b) Comment on the factors which modulate the basic metabolic rate in individuals.

4. a) Write notes on the biological importance of vitamins E and K

(or)

b) Give a short account on the metabolic significance of iron and calcium.

5. a) Describe the hormonal regulation of carbohydrate metabolism..

(or)

b) Write notes on the hormones that regulate calcium metabolism.

PART-B (5 X 15 = 75 MARKS)

Answer ALL questions

6. a) Describe in detail the types of chemical bonds and configurations of proteins..

(or)

b) Give an account on the saturated and unsaturated fatty acids and their importance as food materials. Add a note on derived lipids.

7. a) Write an essay on the nomenclature, classification and functions of enzymes..

(or)

b) What are high energy compounds? How they play a central role in energy capture and transfer?

8. a) Give an account on the enzymatic pathways of catabolism of aminoacids. Which facilities their entry into the tricarboxylic acid cycle.

(or)

b) Describe the steps involved in the oxidation of fatty acids.

9. a) Write an essay on the structure and functions of water soluble vitamins.

(or)

b) Write an account on the biological importance of trace elements. Add a note on their toxicity manifestations?

10. a) Give an account on the structure and functional mechanisms of steroidal hormones of animal origin.

(or)

b) Write an essay on the discovery synthesis and biological functions of cyclic AMP.

(For the Candidates admitted from 2007-2008)

M.Sc. DEGREE EXAMINATION (PRIDE)

NON – SEMESTER – ZOOLOGY

PAPER VI: BASIC CONCEPTS OF BIOTECHNOLOGY AND EVOLUTION OF TAXONOMY

Time: 3 hrs. Max. Marks: 100

Part – A (5 x 5 = 25)

Answer ALL questions

1. a) List out the importance of enzymes in rDNA technology.

   Or

   b) Plasmids

2. a) What is SCP? Explain

   Or

   b) Enumerate the various properties of enzymes.

3. a) Briefly explain the protocol used for the production of Monochlonal antibodies.

   Or

   b) Indicate the important features of gene therapy.

4. a) Give an account of factors affecting speciation.

   Or

   b) Write a note on future evolution.

5. a) What are the objectives of Taxonomic keys.

   Or

   b) Role of Chemotaxonomy in classifications

Part – B (5 x 15 = 7 5)

Answer ALL questions

6. a) Discuss in detail the different steps involved in Genetic Engineering

Or

b) Write notes on IVF.

7. a) Describe the method of preparation of penicillin and alcohol industrially.

Or

b) What is Immobilization? Explain the different methods of immobilization?

8. a) What is hybriboma technology? Explain the same with monoclonal antibodies.

Or

b) Define Transgenesis? Explain the methods and add a note on transgenic animals.

9. a) Define Hardy Weinberg Law and explain its role in speciation.

Or

b) Trace the Evolutionary history of man.

10. a) Explain the principles of zoological nomenclature.

Or

b) Discuss the different types of taxonomic keys and add a note on their uses.

(For the Candidates admitted from 2007-2008)

M.Sc. DEGREE EXAMINATION (PRIDE)

NON – SEMESTER – ZOOLOGY

PAPER VII: ANIMAL PHYSIOLOGY AND MEDICAL LABORATORY TECHNIQUES

Time: 3 hrs. Max. Marks: 100

Part – A (5 x 5 = 25)

Answer ALL questions

1. a) Describe the role of intestinal glands.

Or

b) Give an account of integumentary respiration.

2. a) Describe briefly the role of contractile proteins in muscle contraction .

Or

b) Write a note on the insect hormones, and their role.

3. a) Define Bioluminescence and explain the types of bioluminescence.

Or

b) What are ear ossicles? Add a note.

4. a) Write a brief account on the Medical laboratories and Laboratory personal in our country.

Or

b) Explain the principle of electron microscope.

5. a) Write an account of physical methods of sterilisation.

Or

b) How to collect the blood sample for the clinical study (2 methods).

Part – B (5 x 15 = 7 5)

Answer ALL questions

6. a) What are respiratory pigments? Explain their role in O_2 and CO_2 transport.

Or

b) What is blood coagulation? Describe the different theories regarding blood clotting.

7. a) Describe the physico-chemical and electrical events in the transmission of nerve impulse in unmyelinated fibre and synapse.

Or

b) Describe the structure and function of Pituitary gland.

8. a) Draw the structure of human eye and explain the physiology of vision.

Or

b) Write the Chemistry and Functional significance of bioluminescence.

9. a) Explain the functional components of a clinical laboratory.

Or

b) Discuss in detail the methods of storage of different chemicals and the safety measures for the avoidance of accidents in a clinical law.

10. a) How will you prepare blood smear and describe the abnormalities of RBCs with suitable diagrams.

Or

b) Describe the methods of analysis of Glucose, protein and albumin and add a note on their clinical significance.

(For the Candidates admitted from 2007-2008)

M.Sc. DEGREE EXAMINATION (PRIDE)

NON – SEMESTER – ZOOLOGY

PAPER VIII: APPLIED AND STORAGE ENTOMOLOGY AND SERICULTURE

Time: 3 hrs. Max. Marks: 100

Part – A (5 x 5 = 25)

Answer ALL questions

1. a) Write notes on Pest surveillance.

   Or

   b) What are the methods adapted for the estimation of insect damage? Explain.

2. a) Describe the bionomics and control measures of the Red hairy caterpillar.

   Or

   b) Write briefly on common insect pests of banana.

3. a) Explain the cultural methods in controlling pests of crops.

   Or

   b) Write about bee products, their properties and uses.

4. a) How will you prepare land for mulberry cultivation?

   Or

   b) Assess the quality of mulberry leaves for feeding the different stages of silkworm larvae.

5. a) Give a brief account on Grainage techniques.

   Or

   b) Explain the methods of disinfection of rearing house of silkworm.

Part – B (5 x 15 = 7 5)

Answer ALL questions

6. a) Give an account of the bionomics and control measures of any four insect pests of sugarcane.

Or

b) Explain in detail about any four stored grain pests and their management.

7. a) Explain in detail about IPM.

Or

b) Write an account on non conventional methods of pest control.

8. a) Give an account on the insecticide resistance to insects and explain the methods adopted to reduce it.

Or

b) Define biological control. Add on its merits and demerits.

9. a) Write an essay on non-mulberry silk worms.

Or

b) Write an account on the diseases of silk worm larvae.

10. a) What are the procedures followed in a grainage.

Or

b) Explain in detail about the methods of reeling, and re-reeling.