PERIYAR UNIVERSITY
PERIYAR PALKALAI NAGAR
SALEM – 636 011

DEGREE OF MASTER OF SCIENCE

CHOICE BASED CREDIT SYSTEM

SYLLABUS FOR M.SC. ZOOLOGY

FOR THE STUDENTS ADMITTED FROM THE ACADEMIC YEAR 2012 – 2013 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 2012-2013 onwards)

Semester	Course	Course Code	Name of the Course	Hrs/W		Credit	Exam hrs	Marks		
				L	P			IA	EA	Total
I	Core I	12PZO01	Functional Morphology of Invertebrates and Chordates	5	0	3	3	25	75	100
	Core II	12PZO02	Cell and Molecular Biology and Biophysics	5	0	3	3	25	75	100
	Core III	12PZO03	Advanced Genetics	5	0	3	3	25	75	100
	Core IV	12PZO04	Basic Concepts of Microbiology and Immunology	5	0	3	3	25	75	100
	Core Practical I	12PZOP01	Functional Morphology of Invertebrates and Chordates, Cell and Molecular Biology and Biophysics, Advanced Genetics and Microbiology and Immunology	0	5	6	4	40	60	100
	Elective I	12PZOZ01	First Aid and Home Nursing	5		3	3	25	75	100
			Total	**25**	**5**	**21**				**600**

Semester	Course	Course Code	Name of the Course	Hrs/W		Credit	Exam hrs	Marks		
				L	P			CIA	EA	Total
II	Core V	12PZO05	Biostatistics and Computer Applications	5	0	3	3	25	75	100
	Core VI	12PZO06	Biochemistry	5	0	3	3	25	75	100
	Core VII	12PZO07	Environmental Science	5	0	3	3	25	75	100
	Core Practical II	12PZOP02	Biostatistics and Computer Applications, Biochemistry and Environmental Science		5	6	4	40	60	100
	Elective II	12PZOZ02	Nutrition and Dietetics	5	0	3	3	25	75	100
	Choice based EDC	12PZOED1 12PZOED2	Choose any one of the following Fishery Biology and Aquaculture Poultry Farming	4	0	4	3	25	75	100
	H.R.	12PHR01	Human Rights	1	0	2	3	25	75	100
			Total	**25**	**5**	**24**				**700**

Semester	Course	Course Code	Name of the Course	Hrs/W		Credit	Exam Hrs	Marks		
				L	P			CIA	EA	Total
III	Core VIII	12PZO08	Developmental Biology	5	0	3	3	25	75	100
	Core IX	12PZO09	Basic Concepts of Biotechnology	5	0	3	3	25	75	100
	Core X	12PZO10	Animal Physiology	5	0	3	3	25	75	100
	Core XI	12PZO11	Optional Subject – I - Applied and Storage Entomology	5	0	3	3	25	75	100
	Core Practical III	12PZOP03	Developmental Biology, Basic Concepts of Biotechnology, Animal Physiology and Optional Subject – I - Applied and Storage Entomology	0	5	6	4	40	60	100
	Elective III	12PZOZ03	Acquired Immuno Deficiency Syndrome (AIDS) and Awareness	5	0	3	3	25	75	100
			Total	**25**	**5**	**21**				**600**

Semester	Course	Course Code	Name of the Course	Hrs/W		Credit	Exam hrs	Marks		
				L	P			CIA	EA	Total
IV	Core XII	12PZO12	Evolution and Taxonomy	5	0	3	3	25	75	100
	Core XIII	12PZO13	Medical Laboratory Techniques	5	0	3	3	25	75	100
	Core XIV	12PZO14	Optional Subject – II - Sericulture	5	0	3	3	25	75	100
	Core Practical IV	12PZOP04	Evolution and Taxonomy, Medical Laboratory Techniques, Optional Subject - II – Sericulture and Microtechnique	0	5	6	4	40	60	100
	Core Dissertation	12PZODT	Dissertation – - Report Evaluation - 75 Viva voce - 25	0	5	6	-	-	-	100
	Elective IV	12PZOZ04	Economic Zoology	5	0	3	3	25	75	100
			Total	**20**	**10**	**24**				**600**
			Grand Total	**95**	**25**	**90**				**2500**

COURSE COMPONENT

Course	Number of Course	Credit Per Course	Total Creditors	Total Marks
Core Courses	14	3	42	1400
Elective Course	4	3	12	400
Practical	4	6	24	400
Dissertation	1	6	6	100
EDC	1	4	4	100
Human Rights	1	2	2	100
		Total	**90**	**2500**

PERIYAR UNIVERSITY, SALEM – 11

M.SC. BRANCH - VI – ZOOLOGY

(Effective from the academic year 2012-2013 onwards)

FIRST SEMESTER

CORE – I – FUNCTIONAL MORPHOLOGY OF INVERTEBRATES AND CHORDATES

Subject Code : 12PZO01 **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 elasmobranches 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 palaentology, 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

Subject Code : 12PZO02 **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 cyles.

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 (Principlies 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,

3. Narayanan, P. (2007), "Essential of Biophysics", New age international publications, New Delhi.

4. Rodnly M.J. Cotter ill 2002. An introduction to Biophysics – John Wiley & Sons Ltd.,

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

Subject Code : 12PZO03 **Hours : L+T+P=C**

Mark : 100 **5 +0+0=3**

Unit – I : Molecular Genetics

Molecular structure of DNA Gene concept - One gene one polypeptide concept. Identification of DNA and RNA as the genetic material. Microbial Genetics – Conjugation, transformation and transduction and Seduction. Chromosome mapping in prokaryotes. (Virus, Bacteria) and eukaryotes (Neurospora, and Man)

Unit II : Regulation of Gene action

Enzyme regulation of gene action. Regulation of gene action-Operation concept - GAL and LAC Operon system. Evidence of regulation of gene action. Genes and metabolism. Inborn errors of metabolism in Main (With reference to protein, carbohydrates, Lipid and nucleic acid metabolism).

Unit – III : Chromosome and Genetics Disorders

Evolution of sex chromosomes. Dosage compensation – X inactivation. Geneomic imprinting Human Genetics. Normal human karyotype – Vriations in karotypes (autosomal and sex chromosomal, structural and numerical) with special reference to classical syndromes in man. Principles and methods of pedigree analysis – **Genetic counseling** – Objectives, ethics and principles. Methods of counseling for point mutation, disorders, structural and chromosomal disorders.

Human Genetics. Normal human karyotype – Vriations in karotypes (autosomal and sex chromosomal, structural and numerical) with special reference to classical syndromes in man.

Unit – IV : Genes in Development and Population genetics

Genes in development and differentiation Mechanism of chromosomal breakage – physical chemical and biological factors or agents. Mutagens and mutagenesis and carcinogenesis – genetic changes in Neoplasia in man.

Population genetics: Population and gene pool. Hardy – Weinberg Law-Genetic equilibrium. Calculation of gene frequencies for Autosomal (Complete dominance, codominance and multiple alleles) and sex linked genes. Factors affecting Hardy Weinberg equilibrium.

Unit – V: Genetic Engineering and Applied Genetics

Genetic Engineering – Restrictive enzymes – Recombinant DNA techniques. Applications of Recombinant DNA technology.

Applied Genetics – Application of genetics in animal breeding. Application of genetics in Crime and Law-DNA fingerprinting. Genetic basis of intelligence. Studies on Twins.

Reference Books

1. Waston. J.D. Hopkins, N.H.., Roberts, J.W., Steitz, J.A. and Weiner, A.M. 1987 Molecular Biology of the Gene. W.A. Benjamin/Cummings Co., New York.

2. Sinnot. E.W., Dunn. L.C., Dobzhansky, T.H. 1973. Principles of Genetics. McGraw Hill Co., New Delhi.

3. Daniel L.Hartl. 1994. Genetics. Jones and Barflaff Publishing, Boston.

4. Lewin, B. 2000. Genes VII. Oxford university Press, New York.

5. Ayala, F. I. and Kieger, J.A. Jr. 1980 Modern Genetics. The Benjamin Publishing Co., London,

6. M.Sc., Zoology : Syllabus (CBCS) 6. Goodenough, U. 1984. Genetics. Saundes College Publishing Co., London.

7. Curs Sten 1973 Principles of Human Genetics. W.H. Freeman and Co., New York.

8. Jenking, J.B. 1983, Human Genetics. The Benjamin Cummings Publishing & Co., London.

9. Market, C.L. & Ursprung, 1973. Development Genetics, Prentice Hall.

10. Gardner E.J. Simmons, M.J. and Snustad, D.P.1991 John Wiley & Sons, New York.

11. Tamarian, R.H. 1996. Principles of Genetics, WCB Publishers Munro.

12. Stickberger, M.W. 1985. Genetics. Printice – Hall of India, Pvt. Ltd., New Delhi.

13. Pandian, T.J. and Muthukrishnan, J. 1988. Workshop on Research Methods for Chormosomal Manipulation in Fish. Department of Biotechnology Govt. of India, New Delhi.

14. Pandian, T.J. and Muthukrishnan, J. 1990. Research Methods for Gene and Choromosome Manipalation if Fish. Department of Biotechnology, Govt. of India, New Delhi.

CORE – IV : BASIC CONCEPTS OF MICROBIOLOGY AND IMMUNOLOGY

Subject Code : 12PZO04 **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, prevention and control of **Bacterial** (Staphylococcus, Streptococcus, Typhoid, Cholera) **Viral** (Polio, HIV, HBV A and B) and **Protozoans** (Entamoeba, Plasmodium) agents of man.

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. Phosphate Solubilizing Bacteria microbes; biological control NPV, BT. Biocomposting – Microbial mediated. Biofertilizers – Azotobacter, Azosprillum, VAM.

IMMUNOLOGY

Unit IV – Innate and Cellular Immunity and Antigens

Innate and acquired immunity, haematopoiesis, cells and organs of the immune system. Antigens – types, epitopes. Antibody – Immunoglobulin – types – subtypes properties and functions Major histocompatibility complex (MHC)

Unit V

Immune response to viral – bacterial disease – parasitic infections and fungal diseases – Hypersensitivity reactions. Immune deficiency diseases –AIDS, Auto immune diseases. Vaccines – types of vaccines –immunization schedule. Immunosupression.

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.

7. RAJASEKARA PANDIAN M and SENTHILKUMAR B (2007) Immunology and Immunotechnology. Panima Publishing Corporation, New Delhi.

CORE - PRACTICAL – I

FUNCTIONAL MORPHOLOGY OF INVERTEBRATES AND CHORDATES, CELL AND MOLECULAR BIOLOGY AND BIOPHYSICS, ADVANCED GENETICS AND MICROBIOLOGY AND IMMUNOLOGY

Subject Code : 12PZOP01 **Hours : L+T+P=C**

Mark : 100 **0 +0+5=6**

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.
4. Mounting of mouth parts of Honey bee, Housefly and Mosquito.

Chordates

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

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

Subject Code : 12PZOZ01 **Hours : L+T+P=C**

Mark : 100 **5 +0+0=3**

Unit : I

Principles of first aid. Signs and symptoms and first aid for Snake bites, Dog bites, Insect bites.

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 Nurshing 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 : 12PZO05 **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.

3. SHARMA, A.K (2005) Text book of Biostatistics, Discovery publ. House, New Delhi – 110002.

4. VEER BALA RASTOGI (2007) Fundamentals of Biostatistics. Are Books India New Delhi.

5. P.N. ARORA & P.K. MALHAN (2007) Biostatistics – Himalaya publ. House, Mumbai.

COMPUTER SCIENCE

TEXT BOOKS:

1. ALEXIS LEON and MATHEWS LEON (1998; "Fundamentals of Computer Science ani Communication Engineering", Leon Techword Chennai.

2. RAJARAMAN, V. (1992), "Fundamentals of computers" 8th Edition, Prentice - Hall of India Private Limited New **Delhi.**

3. PRADEEP K. SINHA and PRITE SINHA (2005). Computer Fundamentals BPB Publications – 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 : 12PZO06 **Hours : L+T+P=C**

Mark : 100 **5+0+0=3**

Unit - I : Water

Scope- Atoms, Molecules, Polymerization of organic molecules – major organic components – Chemistry of water – Biological importance, pH and Acid – Base balance. Henderson Hasselbach equation. Buffers – Biological importance. Acidosis, alkalosis. Electrolyte and water balance.

Unit – II: Biomolecules

Amino acids – structure, classification and function. Peptide bonds. Essential and non – essential amino acids, isoelectric point, switter ion. Protein – structure, classification, Properties of protein –Deamination, transamination, transmethylation. Enzymes – general properties function, classification, nomenclature. Enzyme kinetics – Factors affecting enzyme action, Mechanism of enzyme action, Regulation of enzyme action.

Unit – III : Bioenergetics and Metabolism of Carbohydrate and Lipids

Carbohydrate- structure, classification and biological significance.

1. Glycogenesis, 2. Glycogenolysis, 3. Glyconeogenesis, 4. Glycolysis, 5.Embden Meyerhof pathway, 6. Hexose mono phosphate shunt. **Lipids** – structure

and classification, Lipids of biological significance, Biosynthesis and Oxidation of Fatty Acids. Bio Energetics.

Unit – IV : Hormones

General function, Classification – Steroid hormones, Protein Hormones, Tissue Hormones. Vasoactive Peptide Synthetic Hotmones. Mechanism of Hormone action.

Unit – V : Vitamins

Water and Lipid soluble Vitamins – structure, classification, sources and deficiencies in man. Metabolism of Xenobiotics – Detoxification and Biotransformation.

Reference Books

1. Murray, R. K, Granner, D.K. Maynes, P.A and Rodweli, V.W. 1998. Harper's Biochemistry. 25th Edition. McGraw Hill, New York.

2. Hames, B.D., Hoopa, N.M and Houghton, J.D. 1998. Instant notes in Biochemistry. Viva Books Pvt. Ltd. New Delhi.

3. Jain, J.L. Jain, S. and Jain N. 2005. Fundamental of Biochemistry, S. Chandra & Co. Ltd. New Delhi.

4. Vasudecan, D.M. and Sreekumar. S. 2000. TExt of Biochemistry for Medical students. Jaypee Brothers, Medical Publishers (P) Ltd. New Delhi.

5. Rama Rao, A.V.S.S. 1986. Text Book of Biochemistry. L.K. & S Publishers. A.P.

6. Ambika, S. 1990. Fundamentals of Biochemistry for Medical Students, Published by the author.

7. Lehhinger, A.L. 2004. Principles of Biochemistry. CBS Publishers, New Delhi.

8. Zubay, G.1989. Biochemistry, McMillian Publishing Co., New York.

9. Voct, D and Voct, J.G. 2004. Biochemistry. John Wiley and Sons, Inc.

10. Ambika Shanmugam – Test book of Biochemistry

11. Veerakumari (2002) Biochemistry MJP Publishers, Chennai.

12. Gurumani – Research Methodology for Biological Sciences. MJP Publishers, Chennai – 600 005.

CORE – VII - ENVIRONMENTAL SCIENCE

Subject Code : 12PZO07 **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, tidel 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 : 12PZOP02 **Hours : L+T+P=C**

Mark : 100 **0+0+5=6**

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 : 12PZOZ02 **Hours : L+T+P=C**

Mark : 100 **5 +0+0=3**

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.

EXTRA DISCIPLINARY COURSE (EDC)

(For the P.G. Students Other than Zoology, admitted from 2012-2013 onwards)

SECOND SEMESTER

FISHERY BIOLOGY & AQUACULTURE

(Syllabus)

Subject Code : 12PZOED1 **Hours : L+T+ P=C**

Mark : 100 **4 +0+0=4**

Unit : I

Introduction – Importance of Inland fisheries principles and 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 – types of fish ponds – management of fish culture – breeding – types of breeding – Natural and induced.

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

Processing and Preservation – Fish spoilage – processing and preservation. Fish – Rigor mortis – spoilage. Principles and process of preservation Methods of preservation. By products of fishing industries.

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 2012-2013 onwards)

SECOND SEMESTER

POULTRY FARMING

(Syllabus)

Subject Code : 12PZOED2 **Hours : L+T+ P=C**

Mark : 100 **4 +0+0=4**

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 – Nutritional value of eggs – grading – Preservation – Marketting 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.

SYLLABUS

HUMAN RIGHTS

Subject Code : 12PHR01 **Hours : L+T+P=C**

Mark : 100 **1+0+0=2**

Unit - I : Introduction

Meaning and Definitions of Human Rights – Historical Evolution of Human Rights – Formation of UNO, Universal Declaration of Human Rights 1948 – Constitutional Provision for Protection of Human Rights – Fundamental Rights and Directive Principles of State Policy - Fundamental Duties and Human Rights Education.

Unit – II : Civil, Political and Economic Rights

Rights 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 Form Association and Unions – Right to Movement – Right to Family – Right to Contract – Right to Constitutional Remedies – Right to Vote and Contest in Elections – Right to Hold Public Offices – Right to Information – Right to Criticize the Govt. – Right to Democratic Governance. Right to Work – Right to Adequate Wages – Right to Reasonable Hours of Work – Right to Fair Working Conditions – Right to Self Govt. in Industry – Customer Rights – Social and Cultural Rights – Rights to Life – Right to Clean Environment.

Unit – III : Civil, Political and Economic Rights

Human Rights Act 1993 – Structure and Functions of National Human Rights Commission – State Human Rights Commission and Human Rights Courts – Rules and regulations of state human rights commission 1997.

Unit – IV : Human Rights Movements for Social Development

Indian Freedom Movement – Peasant Movement – Women's Movement – SC/ST Movements – Environment Movement.

Unit – V : Human Rights Violation

Violation of Rights among Children, Women, Minorities, SCs and STs, HIV/AIDS Patients, Trans-genders, Convicts and Prisoners, Slavery and Disabled, Provision of constitutional rights during the arrest.

References:

1. Baradaf Sergio and Swaronjali Ghosh. Teachings of Human Rights: Dominant Publishers and Distributors, New Delhi. 2009.

2. Umesh Bhatt. Human Rights Achievements and Challenges: Vista International Publishing House, Delhi. 2005.

3. Roy A.N. Human Rights Tasks, Duties and Functions: Aavishkar Publishers and Distributors, Jaipur. 2007.

4. Asish Kumar Das and Prasant Kumar Mohanty. Human Rights in India: Sarup and Sons. New Delhi. 2007.

5. Sankar Sen. Human Rights in a Developing Society. A.P.H. Publishing Corporation, New Delhi. 2009.

6. Bani Borgohain. Human Rights Social Justice and Political Challenge. Kanishka Publishers and Distributors. New Delhi. 2007.

7. Rathod, P.B. Focus on Human Rights: ABD Publishers, Jaipur. 2007.

8. Velan, G. Human Rights and Development Issues: The Associated Publishers, Ambala Cantt. 2008.

9. Meena, P.K. Human Rights Theory and Practice: Murali Lal and Sons, New Delhi, 2008.

10. Bhavani Prasad Panda. Human Rights Development and Environmental Law: Academic Excellence, Delhi.2007.

11. Viswanathan, V.N. Human Rights - Twenty First Century Challenges: Kalpaz Publications, New Delhi. 2008.

12. Goswami. Human Rights and Reforming the Law. Raj Publishing House, Jaipur. 2008.

13. Digvijay Nath Pandey. Teaching of Human Rights: Lotus Press, New Delhi, 2007.

14. Ansari, M.R. Protecting Human Rights: Max Ford Books, New Delhi, 2006.

15. Rao, M.S.A. Social Movements in India – Social Movements and Social Transformation in India Vol. 1 & 2: Manohar Publications, New Delhi. 1978.

16. Bakshi, P.M. The Constitution of India: Universal Law Publishing Co.Pvt.Ltd., Delhi. 2006.

THIRD SEMESTER

CORE – VIII : DEVELOPMENTAL BIOLOGY

Subject Code : 12PZO08 **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, Patters 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 toEmbryology, 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 : 12PZO09 **Hours : L+T+P=C**

Mark : 100 **5+0+0=3**

Unit - I : Techniques of Genetic Engineering

Biotechnology : Definition – Scope – Importance – Land marks in the history – Gene cloning – the basic steps – various types of restriction enzymes – ligase linkers and adaptors – c DNA – transformation – Selection of recombinants. Hybridization techniques chemical systhesis of oligonucleotides.

Gene probe- Molecular finger printing (DNA finger printing) – RFLP – the PCR techniques – Genomic library – Blotting techniques – Southern blotting – Northern blotting – Western.

Unit – II : Cloning Vectors

Plasmid biology – cloning vector based on E. coli, PBR 322 and bacteriophage. Cloning vector for yeast. Cloning vector for Agro bacterium tumefactions. Cloning vector for mammalin cells – Simian virus 40 – Gene transfer technology – Particle bombardment – Micro injection techniques.

Unit - III : Plant And Animal Biotechnology

Plant tissue culture-Explants, Sterilization, Media preparation, micro propagation, Green house. Animal Cell culture-organ culture-whole embryo

culture- Embryo transfer-Invitro fertilization (IVF), Artificial Insemination, Gryo preservations 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 : Environmental Applications Biotechnology

Bioremediation –bioremediation of hydrocarbons – Industrial wastes – Heavy metals – Xenobiotics – bioleaching – biomining – biofuels. Applications of biotechnology in agriculture, medicine and food science. Genetically modified organism (GMO'S) – GM foods. Biotechnology & biosafety – IPR.

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.

4. Ramadass (2009), Animal Biotechnology – Recent Concepts and developments MJP. Publishers Chennai – 600 005.

5. Colin Ratlege and Bjorn Kristiansen (2006) Basic Concepts of Biotechnology Cambridge University Press.

Reference Books

1. Purohit, S.S. and S.K.Mathur. 1999. Biotechnology Fundamentals and Application. Agro Botanica, New Delhi.

2. Alan Scragg. 1999. Environmental Biotechnology, Longman Publication.

3. R.C.Dubey 2001 A text book of biotechnology. Rajendra Ravindra Printer. New Delhi.

4. T.A. Brown 2004 Gene cloning and DNA analysis. Blackwell Science, Osney Mead, Oxford.

5. Dawson, M.T., Powell . R, and Gannon, F.1996. Gene Technology. Bios Scientific Publishers.

6. Chopra, V.L. and Nanin, A.1992. Genetic Engineering and Biotechnology. Oxford and I BH Publishing Co., New Delhi.

7. Marx, J.L.1989 A Revolution in Biotechnology. Cambridge University, Press Oxford.

8. Old, R.W. and Primrose, S.B. 1985 Principles of Gene Manipulations. An introduction to Genetic Engineering. Oxford Blackwell Publishers, London.

9. Winnacker, E.L. 2003. From Genes to Clones. Panima Publishing Corporation, New Delhi.

10. Gupta, P.K. 2004. Biotechnology and Genomics. Rastogi Publications, Meerut.

11. Das. H.S. 2004. Text Book of Biotechnology. Wiley Dreamtech India Pvt. Ltd., New Delhi.

CORE – X - ANIMAL PHYSIOLOGY

Subject Code : 12PZO10 **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 – O_2 and CO_2 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 : 12PZO11 **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 : 12PZOP03 **Hours : L+T+P=C**

Mark : 100 **0+0+5=6**

I. Developmental Biology

1. Blastodern 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 : 12PZOZ03 **Hours : L+T+P=C**

Mark : 100 **5+0+0=3**

Unit - I

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

Unit - II

HIV Structure, Replication of the HIV, Pathology of HIV infection, clinical manifestations.

Unit - III

Routes of Transmission of HIV - opportunistic infections and associated secondary Immunodeficiency diseases, 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.
3. Talero KP and Talero A (2002): Foundations in Microbiology. 4th Edition McGraw Hill.
4. Anantha Narayanan R and Panikar CKJ (2002). 6th Edition. Orient Longman Pvt.Ltd
5. Greenwood, D., R.B. Slack and J.F. Peutherer, (2002). Medical Microbiology (16th Edition). Churchill Livingstone, London.
6. Parija, S.C, (2004). Text Book of Medical Parasitology – Protozoology and Helminthology. (2nd Edition). All India Publishers and Distributors, Medical Book Publisher, New Delhi.
7. Alexopoulus, C.J. and C. W. Mims, (1993). Introductory Mycology (3rd edition). Wiley Eastern Ltd., New Delhi.
8. Patric R Murray (1990). Medical Microbiology. Mosby Publications.
9. Jagadish Chander (1996). A text book of Medical Mycology. Interprint, New Delhi.

FOURTH SEMESTER

CORE – XII - EVOLUTION AND TAXONOMY

Subject Code : 12PZO12 **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 – Darwinisim – 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 : 12PZO13 **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 pregnanacy 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 : 12PZO14 **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 Primlani 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 : 12PZOP04 **Hours : L+T+P=C**

Mark : 100 **0+0+5=6**

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. (Vinstar 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 : 12PZOZ04 **Hours : L+T+P=C**

Mark : 100 **5 +0+0=3**

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 apiculture.

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 rearing 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.

6. Arumugam .N (2008) Aquaculture, Saras Publication Nagarkoil, Tamilnadu.

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 2012 – 2013 on wards)

Time : 3 Hrs. Max. Marks : 75

PART – A (10 x 2 = 20)

Define / Briefly Explain

Answer **ALL** question All questions carry equal marks.

PART – B (5 x 5 = 25)

Answer any five questions. Each answer not exceeding 250 words. All questions carry equal marks.

PART – C (3 x 10 = 30)

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 2012 – 2013 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

12ZO 01

(For the candidates admitted from 2012-2013 onwards)

Msc., DEGREE EXAMINATION

Zoology

FIRST SEMESTER

CORE – I

FUNCTIONAL MORPHOLOGY OF INVERTEBRATES AND CHORDATES

Time : Three Hours **Maximum :75 Marks**

Part-A (10x2 = 20 marks)

Answer **ALL** the Questions. Define / Briefly explain

1. Symmetry
2. Conjugation
3. Nematocyst
4. Planula Larva
5. Coelom
6. Tube feet
7. Anadramous migration
8. Terrestrialization
9. Synsacrum
10. Cleidoic egg

Part B (5x5=25 marks)

Answer any **FIVE** questions. Each answer not exceeding 250 words. All questions carry equal marks.

11. Comment on deep sea sponges.
12. What are the structural peculiarities and affinities of ctenophora?
13. Write notes on Archiannelida.
14. Draw the phylogeny of arthropoda.
15. Explain the parasitic adaptations of platyhelminthes
16. Write notes on adaptive radiation of elasmobranchs.
17. Consider archaeopteryx as a connecting link.
18. Briefly explain the aortic arches of vertebrates.

Part C (3x10=30 marks)

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

19. a. Classify the animal Kingdom.

    (or)

    b. Briefly explain the theories of origin of metazoa

20. a. Give an account of canal system in sponges

    (or)

    b. Write an essay on the water vascular system in echinoderms.

21. a. Discuss the origin and evolution of amphibia.

    (or)

    b. Write an account on the structural peculiarities of prototheria, metatheria and eutheria

12PZO 02

(For the candidates admitted from 2012-2013 onwards)

Msc., DEGREE EXAMINATION

Zoology

FIRST SEMESTER

CORE – II

CELL AND MOLECULAR BIOLOGY AND BIOPHYSICS

Time : Three Hours **Maximum: 75 Marks**

Part-A (10x2 = 20 marks)

Answer **ALL** the Questions. Define / Briefly explain

1. Eukaryotie
2. Dermatome
3. Cell cycle
4. Chromatin
5. Codon
6. Repressor
7. Resolving power
8. rpm
9. Define isotopes.
10. List out the colors of natural light.

Part B (5x5=25 marks)

Answer any **FIVE** questions. Each answer not exceeding 250 words. All questions carry equal marks.

11. State the functions of golgi complex.
12. Briefly explain the functions of endoplasmic reticulum
13. "Polytene chromosomes are unusual" – discuss.
14. Write an account on different types RNA and their functions.
15. What is DNA repair mechanism?
16. Explain the process of DNA replication.
17. Explain the principle and applications of Electrophoresis.
18. What are the properties of Natural light?

Part C (3x10=30 marks)

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

19. a. Give an account of ultra structure and functions of plasma membrane.

    (or)

    b. What is the role of mitochondria in ATP production?

20. a. Explain the dynamics of meiotic cell division.

    (or)

    b. Give an account of gene action in protein synthesis.

21. a. Explain the principles involved in Electron microscope.

    (or)

    b. Write an account on biological applications of isotopes.

12PZO 03

(For the candidates admitted from 2012-2013 onwards)

Msc., DEGREE EXAMINATION

Zoology

FIRST SEMESTER

CORE – III

ADVANCED GENETICS

Time : Three Hours **Maximum: 75 Marks**

Part-A (10x2 = 20 marks)

Answer **ALL** the Questions. Define / Briefly explain

1. Conjugation
2. Sexduction
3. Operan concept
4. Karyotype
5. Autosome
6. Pedigree
7. Mutagen
8. Co-dominance
9. Molecular scissors
10. Breeding

Part B (5x5=25 marks)

Answer any **FIVE** questions. Each answer not exceeding 250 words. All questions carry equal marks.

11. Explain the mechanism of bacterial transformation
12. Describe DNA replication
13. What is Inborn error metabolism
14. What are the principles of pedigree analysis
15. Comment on the application of genetics in the study of twins
16. Write an account on carcinogenesis
17. What are the mechanisms of chromosomal breakage
18. Write about DNA finger printing and add their applications

Part C (3x10=30 marks)

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

19. a. Write account on chromosomal mapping in prokaryotes

(or)

b. Write an essay on gene regulation in protein synthesis

20. a. Write about Genetic counseling Add a note on its objectives, ethics, and principles

(or)

b. Explain variation in karyotypes with special reference to classical syndrome in man

21. a. What is Hardy Weinberg equilibrium? What are the factors affecting gene frequency

(or)

b. Discuss the applications of genetics in Crime and law

12PZO 04

(For the candidates admitted from 2012-2013 onwards)

Msc., DEGREE EXAMINATION

Zoology

FIRST SEMESTER

CORE – IV

BASIC CONCEPTS OF MICROBIOLOGY AND IMMUNOLOGY

Time : Three Hours **Maximum: 75 Marks**

Part-A (10x2 = 20 marks)

Answer **ALL** the Questions. Define / Briefly explain

1. Gram staining
2. Antibiotics
3. Etiological agents
4. HIV
5. Nitrogen fixation
6. Yoghurt
7. VAM
8. Epitope
9. Parasite
10. AIDS

Part B (5x5=25 marks)

Answer any **FIVE** questions. Each answer not exceeding 250 words. All questions carry equal marks.

11. Differentiate Gram positive and Gram negative Bacterial cell wall

12. Write an account on physical and chemical methods of control of microorganisms

13. How Vibrio cholarae gets transmitted Add its control measures.

14. How can you detect microorganisms from milk?

15. Explain symbiotic and non symbiotic association with suitable example

16. Explain Immunoglobulin types

17. Write an account on immunodeficiency diseases

18. What is immunosuppression? Explain how immune system gets suppressed?

Part C (3x10=30 marks)

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

19. a. What is sterilization. State the different types of sterilization techniques?

(or)

b. Narrate the Life cycle of Plasmodium sp.How it causes malaria fever?

20. a. What are the different physical and chemical methods of food preservation?

(or)

b. With suitable example explain the importance of Biofertilizer in plant growth.

21. a. Define MHC. Add their functions in detail.

(or)

b. Give an account of vaccines and their production.

12PZO Z01

(For the candidates admitted from 2012-2013 onwards)

Msc., DEGREE EXAMINATION

Zoology

FIRST SEMESTER

ELECTIVE –I

FIRST AID & HOME NURSHING

Time : Three Hours **Maximum: 75 Marks**

Part-A (10x2 = 20 marks)

Answer **ALL** the Questions. Define / Briefly explain

1. How will you identify a snake bite?
2. Define first aid
3. What are the effects of heat?
4. Heat stroke.
5. Home Nursing
6. Name the instrument used to count pulse rate
7. Define blood pressure.
8. What do you mean by infection?
9. Define hot bath.
10. What are the general applications of heat?

Part B (5x5=25 marks)

Answer any **FIVE** questions. Each answer not exceeding 250 words. All questions carry equal marks.

11. What first aid you will give for snake bite and dog bite?

12. What are the effects of heat stroke? Explain the first aid for it

13. Briefly explain the clinical thermometer and its uses.

14. Discuss the method of Nursing of Patients suffering from infectious diseases.

15. Define respiration. How will you count the respiratory rate?

16. Explain the method of counting pulse rate.

17. What are the general applications of cold bath and sponging.

18. Explain in detail about the warm bath and medical bath.

Part C (3x10=30 marks)

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

19. a. Explain the principles of first aid

(or)

b. What are the causes of fracture? Explain the types, and signs and symptoms of fracture.

20. a. State the importance of observation of patients' condition and habit.

(or)

b. What are the specific infectious diseases?

21. a. Give an account of general applications of hot bath and cold bath

(or)

b. Explain the routine Nursing care of sick.

12PZO 05

(For the candidates admitted from 2012-2013 onwards)

Msc., DEGREE EXAMINATION

Zoology

SECOND SEMESTER

CORE-V

BIOSTATISTICS AND COMPUTER APPLICATIONS

Time : Three Hours **Maximum :75 Marks**

Part-A (10x2 = 20 marks)

Answer **ALL** the Questions. Define / Briefly explain

1. Ogive curve
2. Student 't' test
3. Regression
4. Memory units
5. E-mail
6. Arithmetic mean
7. S.D
8. Internet
9. Median
10. Write any two Characteristics of Computer

Part B (5x5=25 marks)

Answer any **FIVE** questions. Each answer not exceeding 250 words. All questions carry equal marks.

11. Define Statistics. Explain its applications in Biology?

12. Calculate the S.D for the given data.

    Weight of fishes: 56, 51, 62, 64, 55, 44, 45, 49, 48, 45, 54 gm.

13. Describe the Construction of Regression lines.

14. Give an account of any 3 output devices.

15. Differentiate Hardware from Software

16. Define Primary data and mention its types.

17. Mention the merits and demerits of Arithmetic mean

18. Write the basic concept of 'C' language and mention its types

Part C (3x10=30 marks)

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

19. a. Give an account of the Graphs of Frequency Distribution.

    (or)

    b. Define Chi-square test. Explain how this test is used to calculate goodness of fit?

20. a. Calculate the 2 regression equations X on Y and Y on X from the following data given below:

Weight of Rats (X)	:	2	4	6	8	10
Body length of Rats (Y)	:	5	7	9	8	11

    (or)

    b. Give an account of the Auxiliary Storage devices.

21. a. Discuss the application of computer in science and technology

    (or)

    b. Explain different methods of collection of primary and secondary data.

12PZO 06

(For the candidates admitted from 2012-2013 onwards)

Msc., DEGREE EXAMINATION

Zoology

SECOND SEMESTER

CORE-VI

BIOCHEMISTRY

Time : Three Hours **Maximum :75 Marks**

Part-A (10x2 = 20 marks)

Answer **ALL** the Questions. Define / Briefly explain

1. Atom
2. Acidosis
3. Iso electricpoint
4. Peptide bond
5. Bioenergetics
6. Oxidation
7. Steroid
8. Vitamins
9. Detoxification
10. Biotransformation

Part B (5x5=25 marks)

Answer any **FIVE** questions. Each answer not exceeding 250 words. All questions carry equal marks.

11. Enumerate the properties of water.

12. Derive Henderson – Hasselbalch's equation

13. Write the significance of energy rich compounds

14. Explain the concept of free energy.

15. Outline the steps involved in gluconeogenesis.

16. Explain how glycogen metabolism is regulated.

17. Enumerate the uses of Copper and Iodine.

18. Describe the biochemical role of Vitamin K.

Part C (3x10=30 marks)

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

19. a. How the Electrolyte and water can be balanced.

(or)

b. Write an account on mechanism of enzyme action

20. a. Write about glyconeogenesis

(or)

b. Describe Biosynthesis of lipid

21. a. Write about the structure and classification of carbohydrates

(or)

b. List out the functions and deficiency manifestations of Vitamin B

12PZO 07

(For the candidates admitted from 2012-2013 onwards)

Msc., DEGREE EXAMINATION

Zoology

SECOND SEMESTER

CORE – VII

ENVIRONMENTAL SCIENCE

Time : Three Hours **Maximum :75 Marks**

Part-A (10x2 = 20 marks)

Answer **ALL** the Questions. Define / Briefly explain

1. Food Web
2. Biodiversity
3. What are the conservation methods of forest?
4. Define wild life
5. Energy Resources
6. Nuclear reactors
7. Pollutants
8. Bioindicator
9. Principles of Environmental Education
10. MAB

Part B (5x5=25 marks)

Answer any **FIVE** questions. Each answer not exceeding 250 words. All questions carry equal marks.

11. Describe the pyramid of biomass
12. Explain the values of biodiversity
13. Solar photo volt technology Programme in India
14. Noise Pollution
15. Goals and objectives of Environmental Education
16. How ground water is polluted?
17. Differentiate Deforestation and Afforestation
18. Explain the ST Programmes in India?

Part C (3x10=30 marks)

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

19. a. Write an essay on Energy flow in an ecosystem?

(or)

b. "Water is a natural resource" Discuss

20. a. Briefly Explain the Chipko movement

(or)

b. Briefly explain air Pollution.

21. a. Write an essay on MAB

(or)

b. Give an account on the Biodiversity and sustainable development.

12PZO Z02

(For the candidates admitted from 2012-2013 onwards)

Msc., DEGREE EXAMINATION

Zoology

SECOND SEMESTER

ELECTIVE - II

NUTRITION AND DIETETICS

Time : Three Hours **Maximum : 75 Marks**

Part-A (10x2 = 20 marks)

Answer **ALL** the Questions. Define / Briefly explain

1. Define Food
2. Define Nutrition
3. What is a balanced diet?
4. What is anemia?
5. What is an infectious disease?
6. What do you understand by tuberculosis
7. Define allergy
8. Therapeutic diet
9. Hypertension
10. Define arthrosclerosis

Part B (5x5=25 marks)

Answer any **FIVE** questions. Each answer not exceeding 250 words. All questions carry equal marks.

11. Relate the population and food production.
12. Suggest diet for protein malnutrition.
13. What do you know about Vitamin deficiency?
14. What are the therapeutic diets given for obesity and underweight?
15. What are the diagnostic tests for diabetes mellitus?
16. Explain the importance of nutrition for aged.
17. What are the therapeutic diets given for coronary heart failure patients?
18. What are the objectives of therapeutic diet given for a heart patient?

Part C (3x10=30 marks)

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

19. a. "Food is more than nutrients" - discuss

(or)

b. Suggest diet in nutritional deficiency diseases.

20. a. Explain the therapeutic diets for Diabetes mellitus patients.

(or)

b. Give an account of nutrition during pregnancy.

21. a. Discuss the different sodium restricted diets given for a heart patient.

(or)

b. What are the diseases of heart and circulatory system?

12PZO ED1

(For the candidates admitted from 2012-2013 onwards)

Msc., DEGREE EXAMINATION

Zoology

SECOND SEMESTER

EXTRA DISCIPLINARY COURSE

FISHERY BIOLOGY AND AQUACULTURE

Time : Three Hours **Maximum : 75 Marks**

Part-A (10x2 = 20 marks)

Answer **ALL** the Questions. Define / Briefly explain

1. Monoculture
2. Inland fishery
3. Name any two prawn species used for culture.
4. Seed collection.
5. Hypothecation
6. Induced breeding
7. Electric fishing
8. Gill net
9. Rigor mortis
10. Monocuring

Part B (5x5=25 marks)

Answer any **FIVE** questions. Each answer not exceeding 250 words. All questions carry equal marks.

11. What are the qualities of culturable fish?
12. Explain the aim of fish culture.
13. What are the supplementary feed in prawn culture.
14. Explain the different types of fish ponds.
15. Describe the structure of a fish market.
16. Give a brief account on maintenance of fish farm.
17. What are the different methods of fishing.
18. Discuss the principles of fish preservation.

Part C (3x10=30 marks)

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

19. a. Give an account of importance of inland fisheries.

(or)

b. How will you prepare farm for prawn culture?

20. a. Bring out the details of management of fish culture.

(or)

b. Explain the role of co-operative system in fish marketing.

21. a. Write an account on By-products of fishing industries.

(or)

b. What are the various methods employed is fish preservation?

12PZO ED2

(For the candidates admitted from 2012-2013 onwards)

Msc., DEGREE EXAMINATION

Zoology

SECOND SEMESTER

POULTRY FARMING

Time : Three Hours **Maximum : 75 Marks**

Part-A (10x2 = 20 marks)

Answer **ALL** the Questions. Define / Briefly explain

1. Crop
2. List out the hormones of thyroid gland.
3. Feeder
4. Brooder
5. Culling
6. Broiler
7. Chalaza
8. Composition Egg
9. Egg grading
10. Poultry manure

Part B (5x5=25 marks)

Answer any **FIVE** questions. Each answer not exceeding 250 words. All questions carry equal marks.

11. Explain food and feeding habit of fowls.
12. Describe Endocrine system of a fowl.
13. Enlist the meat products of poultry.
14. How will you select the location of a poultry house?
15. What is a hatching? Briefly explain.
16. Discuss deep litter management.
17. Bring out the importance of marketing of eggs.
18. Discuss the nutritional value of poultry meat.

Part C (3x10=30 marks)

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

19. a. Give an account of grading of eggs.

(or)

b. Give an account of preservation of eggs.

20. a. Write an account on prevention of poultry diseases.

(or)

b. Bring out the importance of poultry farming.

21. a. Explain different types of feeders.

(or)

b. What are the different kinds of poultry houses.

12PZO 08

(For the candidates admitted from 2012-2013 onwards)

Msc., DEGREE EXAMINATION

Zoology

THIRD SEMESTER

CORE-VIII

DEVELOPMENTAL BIOLOGY

Time : Three Hours **Maximum :75 Marks**

Part-A (10x2 = 20 marks)

Answer **ALL** the Questions. Define / Briefly explain

1. Gamete
2. Acrosome
3. Cleavage
4. Exogastrulation
5. Fate map
6. Yolk plug.
7. Metamorphosis
8. Hormone
9. Genetic code
10. Inductors.

Part B (5x5=25 marks)

Answer any **FIVE** questions. Each answer not exceeding 250 words. All questions carry equal marks.

11. Write notes on environmental control of ovulation.
12. Discuss the phenomenon of parthenogenesis
13. Explain post fertilization changes.
14. Explain morphogenetic movements.
15. Regeneration.
16. Embryonic nutrition.
17. Write a brief account on factors influencing gene action.
18. Explain the role of inductors and organizers in the development of an embryo.

Part C (3x10=30 marks)

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

19. a. Write an account on sperm-egg interaction.

(or)

b. Give a brief account on hormonal control of ovulation

20. a. Explain the physiology of gastrulation in amphibian

(or)

b. Write an account on composition and physiology of placenta.

21. a. Discuss the role of inductors and organizers in the development of an embryo.

(or)

b. Give an account of chemical basis of gene action in development.

12PZO 09

(For the candidates admitted from 2012-2013 onwards)

Msc., DEGREE EXAMINATION

Zoology

THIRD SEMESTER

CORE-IX

BASIC CONCEPTS OF BIOTECHNOLOGY

Time : Three Hours **Maximum : 75 Marks**

Part-A (10x2 = 20 marks)

Answer **ALL** the Questions. Define / Briefly explain

1. Adapter
2. RFLP
3. Pbr 322
4. Primer
5. Explant
6. Cryopreservation
7. Vinegar
8. Absymes
9. Xenobiotics
10. GMO's

Part B (5x5=25 marks)

Answer any **FIVE** questions. Each answer not exceeding 250 words. All questions carry equal marks.

11. What is DNA Fingerprinting technique? Add their uses
12. Applications of Western blotting
13. What is Artificial insemination? Add their importance
14. Explain genetherapy
15. Write an account on Single Cell Protein
16. What are enzymes? Add their properties
17. Explain micropropagation technique
18. How can you treat industrial waste for recycling ?

Part C (3x10=30 marks)

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

19. a. What is PCR? How can you amplify genes through PCR technic?

(or)

b. How gene can be transferred? What are the different types of gene transfer technics available.

20. a. What is Invitro Fertilization? How can you exercise for pregnancy?

(or)

b. Explain Bioreactor, How Lactic acid is produced?

21. a. Write an essay on Bioremediation of Hydrocarbon

(or)

b. Write an account on IPR and their importance in the field of Biotechnology and Bsafty.

12PZO 10

(For the candidates admitted from 2012-2013 onwards)

Msc., DEGREE EXAMINATION

Zoology

THIRD SEMESTER

CORE-X

ANIMAL PHYSIOLOGY

Time : Three Hours **Maximum : 75 Marks**

Part-A (10x2 = 20 marks)

Answer **ALL** the Questions. Define / Briefly explain

1. List out the enzymes involved in digestion of proteins.
2. List out the enzymes involved in digestion of lipids.
3. Define respiration
4. Classify the types of hearts
5. What are the patterns of excretion?
6. Osmoregulation
7. Synapse
8. Hormone
9. Catadramous fishes.
10. Define Biological rhythm.

Part B (5x5=25 marks)

Answer any **FIVE** questions. Each answer not exceeding 250 words. All questions carry equal marks.

11. Explain the physiology of absorption.
12. Briefly explain the respiratory pigments.
13. Write short notes on Electrocardiogram
14. Explain the different patterns of excretion in relation to environments.
15. Explain the Osmo, iomic regulation in fishes.
16. Write an account on different types of neurons
17. Given an account of the hormones of pituitary gland and explain their functions.
18. Explain the role of hormones in Chemical Co-ordination.

Part C (3x10=30 marks)

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

19. a. Discuss the enzymes involved in digestion of carbohydrates.

(or)

b. Explain physiology of respiration.

20. a. Write an essay on thermoregulation

(or)

b. Explain the mechanism of muscle contraction.

21. a. Give an account of transmission of nerve impulse.

(or)

b. Discuss the physiology of excretion in man.

12PZO 11

(For the candidates admitted from 2012-2013 onwards)

Msc., DEGREE EXAMINATION

Zoology

THIRD SEMESTER

CORE-XI

OPTIONAL SUBJECT - I - APPLIED AND STORAGE ENTOMOLOGY

Time : Three Hours **Maximum :75 Marks**

Part-A (10x2 = 20 marks)

Answer **ALL** the Questions. Define / Briefly explain

1. Vector
2. Biological control
3. IPM
4. Light trap
5. Inset attractants
6. Insect repellants
7. Insecticides
8. Crop rotation
9. Bee wax
10. Cocoon

Part B (5x5=25 marks)

Answer any **FIVE** questions. Each answer not exceeding 250 words. All questions carry equal marks.

11. Bring out the salient features of the order coleoptera.
12. What are the reasons for insects becoming pests?
13. Discuss any three pests of sugar cane.
14. What are the physical methods of pert management?
15. Write notes on pheromones
16. Classify pesticides based on mode of action
17. Bring out the importance of scavengers
18. Discuss the importance of pest surveillance

Part C (3x10=30 marks)

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

19. a. With suitable example classify the class insect a upto order.

(or)

b. Give an account of pests of paddy.

20. a. "Predators and Parasites" – Explain

(or)

b. Give a brief account on beneficial insects.

21. a. Write an essay on integrated pest management (IPM)

(or)

b. Give an account of the effects of pesticides on ecosystem.

12PZO Z03

(For the candidates admitted from 2012-2013 onwards)

Msc., DEGREE EXAMINATION

Zoology

THIRD SEMESTER

ELECTIVE –III

ACQUIRED IMMUNO DEFICIENCY SYNDROME (AIDS) AND AWARENESS

Time : Three Hours **Maximum :75 Marks**

Part-A (10x2 = 20 marks)

Answer **ALL** the Questions. Define / Briefly explain

1. Define epidemiology
2. What stands for AIDS
3. Explain RNA virus
4. What is Immunodeficiency?
5. Comment on Opportunistic infections
6. What are the symptoms of tuberculosis?
7. What stands for ELISA?
8. What is meant by syndrome?
9. Mention the AIDS control programme
10. HIV sanitorium- explain

Part B (5x5=25 marks)

Answer any **FIVE** questions. Each answer not exceeding 250 words. All questions carry equal marks.

11. Give a short account on origin of AIDS.
12. Write a brief account on epidemiology of AIDS
13. Sketch the HIV structure
14. Discuss briefly about replication of HIV
15. List out the secondary immunodeficiency diseases
16. Comment on signs and symptoms of AIDS in children
17. Discuss the preventive measures of AIDS
18. Describe about councelling for the AIDS patients.

Part C (3x10=30 marks)

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

19. a. Give an elaborate account of transmission of AIDS

(or)

b. Write a detailed account on pathogenesis of HIV

20. a. Discuss in detail about opportunistic infections in HIV patients.

(or)

b. Explain the HIV diagnosis in detail.

21. a. Write an elaborate account on AIDS control programme.

(or)

b. Explain about the immunodeficiency diseases in HIV patients

12PZO 12

(For the candidates admitted from 2012-2013 onwards)

Msc., DEGREE EXAMINATION

Zoology

FOURTH SEMESTER

CORE-XII

EVOLUTION AND TAXONOMY

Time : Three Hours **Maximum : 75 Marks**

Part-A (10x2 = 20 marks)

Answer **ALL** the Questions. Define / Briefly explain

1. Coacervates
2. Cosmozoa
3. Define Species
4. State Handy-Weinberg law
5. Micro evolution
6. Geological Time scale
7. Non adaptive trait
8. Bipolar distribution
9. Taxonomic character
10. Molecular drive

Part B (5x5=25 marks)

Answer any **FIVE** questions. Each answer not exceeding 250 words. All questions carry equal marks.

11. Explain Urey-Miller experiment
12. Theory of Biogenesis
13. What are the factors influencing speciation?
14. How will you predict the future evolution of man?
15. With suitable example explain adaptive radiation.
16. Discuss the evolutionary significance of animal distribution.
17. Briefly explain the principles of Lamarkism
18. Critically discuss the importance of Binomial nomenclature

Part C (3x10=30 marks)

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

19. a. Write an a account on the origin of life.

(or)

b. Explain the role of genetics and natural selection in evolution.

20. a. Give an account of speciation

(or)

b. Explain the evolutionary significance of coloration in animals.

21. a. Trace the evolutionary history of man

(or)

b. Discuss the objectives and uses of taxonomic keys in zoological nomenclature.

12PZO 13

(For the candidates admitted from 2012-2013 onwards)

Msc., DEGREE EXAMINATION

Zoology

FOURTH SEMESTER

CORE-XIII

MEDICAL LABORATORY TECHNIQUES

Time : Three Hours **Maximum : 75 Marks**

Part-A (10x2 = 20 marks)

Answer **ALL** the Questions. Define / Briefly explain

1. Chemical sterilization
2. Ionizing radiation
3. Haemocytometer
4. ESR
5. MCH
6. Prothrombin
7. Normal P^{H} of Urine
8. Any two tests employed in routine analysis of blood sugar
9. RIA
10. What are the applications of ELISA technique

Part B (5x5=25 marks)

Answer any **FIVE** questions. Each answer not exceeding 250 words. All questions carry equal marks.

11. What are the causes of laboratory accidents?
12. How will you prepare glass wares for use in the laboratory?
13. Write brief notes on hematological techniques in analysis of blood.
14. What is the clinical significance of hemoglobin estimation?
15. How specific gravity of Urine is determined?
16. Explain the clinical significances of estimation of ketone bodies and albumin in Urine.
17. Comment on the clinical significance of analysis of semen.
18. State the importance of analysis of faeces.

Part C (3x10=30 marks)

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

19. a. Give an account of physical method of sterilization

    (or)

    b. Explain the importance of total RBC counting and WBC differential counting.

20. a. Give an account of hemorrhage

    (or)

    b. What is HCG test? How it is related to pregnancy testing?

21. a. Explain the role of vectors in transmission of diseases with suitable examples.

    (or)

    b. Give an account of WESTERN BLOT technique.

12PZO 14

(For the candidates admitted from 2012-2013 onwards)

Msc., DEGREE EXAMINATION

Zoology

FOURTH SEMESTER

CORE-XIV

OPTIONAL SUBJECT – II – SERICULTURE

Time : Three Hours **Maximum : 75 Marks**

Part-A (10x2 = 20 marks)

Answer **ALL** the Questions. Define / Briefly explain

1. List out the races of silk wOrm
2. Ecdysone
3. Pruning
4. Name the mulberry varieties.
5. Mountage.
6. Cocoon.
7. Grainage
8. Hibernating eggs.
9. Book making
10. What are the reeling methods?

Part B (5x5=25 marks)

Answer any **FIVE** questions. Each answer not exceeding 250 words. All questions carry equal marks.

11. Briefly describe the life cycle of *Bombyx mori*
12. Enumerate the appliances used for feeding.
13. Write short notes or Bed cleaning
14. Explain various types of brushing method used in rearing houses.
15. Discuss the diseases of silkworm and explain their causative organisms.
16. Explain Acid – treatment of eggs.
17. Describe harvesting and assessment of cocoon.
18. Briefly explain silk examination and grading of silk.

Part C (3x10=30 marks)

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

19. a. Discuss the races of mulberry silk worms.

(or)

b. What are the pests and diseases of mulberry and their control measures.

20. a. Explain different types of mountages used in India.

(or)

b. Write an account on cocoon assessment and marketing.

21. a. Describe the different types of reeling appliances.

(or)

b. Explain the sequence of procedures in grainage of sericulture unit.

12**PZO Z04**

(For the candidates admitted from 2012-2013 onwards)

Msc., DEGREE EXAMINATION

Zoology

FOURTH SEMESTER

ELECTIVE - IV

ECONOMIC ZOOLOGY

Time : Three Hours **Maximum : 75 Marks**

Part-A (10x2 = 20 marks)

Answer **ALL** the Questions. Define / Briefly explain

1. Rice weevil
2. Vector
3. Bee hive
4. Swarming
5. Macrobrachium rosenberg
6. Drag net
7. Hatching pond
8. Fish seed
9. Vermi cast
10. Vamiculture

Part B (5x5=25 marks)

Answer any **FIVE** questions. Each answer not exceeding 250 words. All questions carry equal marks.

11. Explain the insect pests of household goods.
12. Write a brief account on chemical composition of honey.
13. Describe bee hive with a neat diagram.
14. Give an account of the types of prawn farms in India.
15. Briefly explain the culture of fresh water prawn.
16. Write notes on composite fish farming
17. What are the By-products of fishing industry?
18. Discuss the role of vermi casts in improving the soil fertility.

Part C (3x10=30 marks)

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

19. a. Write a detailed account on any two important insects affecting human health.

(or)

b. Give an account of social organization of honey bee.

20. a. Write a detailed account on processing and preservation of prawn.

(or)

b. What are the various methods used in preservation of fish.

21. a. Give a detailed account on the role of earth warm in organic farming.

(or)

b. Write an essay on vermi composting.