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)

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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


Unit – II : Radiates and Acoelomates

Unit – III : Pseudocoelomates and Eucoelomates


Unit – IV : Pisces and Tetrapods – I


Unit – V : Tetrapods – II

Text Books


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

Reference Books


CORE – II : CELL AND MOLECULAR BIOLOGY AND BIOPHYSICS

Subject Code : 12PZO02
Mark : 100

Hours : L+T+P=C
5 +0+0=3

Unit – I : Cell Structure


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


Unit – IV : Bioinstrumentation (Principles and Uses)

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:


Reference Books:


CORE – III : ADVANCED GENETICS

Subject Code : 12PZO03
Mark : 100

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


Unit – III : Chromosome and Genetics Disorders

**Human Genetics.** Normal human karyotype – Variations 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.

Reference Books


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

Unit III : Agro – Microbiology


IMMUNOLOGY

Unit IV – Innate and Cellular Immunity and Antigens


Unit V


Text Book


Reference


5. DAVID FRIED FELDER (1998), Microbial genetics, narosa publishing house, 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.


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)


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

Mark: 100

Hours: L+T+P=C

5 +0+0=3

Unit: I


Unit: II

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

Unit: III


Unit: IV

Normal and Abnormal Blood Pressure. Specific Infectious Diseases. Method of Nursing the patients suffering from them.
Unit: V

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

Reference:

1. TRAINEES PRECIS, NCC College, Gwalior.
SECOND SEMESTER

CORE – V - BIOSTATISTICS AND COMPUTER APPLICATIONS

Subject Code : 12PZO05  
Mark : 100

Hours : L+T+P=C  
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.

Unit – II : Descriptive And Inferential Statistics

- 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 Regression

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


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


BIO STATISTICS

Text books :


COMPUTER SCIENCE

TEXT BOOKS:


REFERENCE BOOKS


Unit - I : Water


Unit – II: Biomolecules


Unit – III : Bioenergetics and Metabolism of Carbohydrate and Lipids

Carbohydrate- structure, classification and biological significance.

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

**Unit – IV : Hormones**


**Unit – V : Vitamins**


**Reference Books**


10. Ambika Shanmugam – Test book of Biochemistry


CORE – VII - ENVIRONMENTAL SCIENCE

Subject Code : 12PZO07
Mark : 100

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

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 – geothermal Programme in India – Types of nuclear reactors – nuclear power status around the world and country.

Unit - IV : Pollution And Management


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


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. Keyboard
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 – O₂, free CO₂, Alkalinity, Salinity, (Carbonates and Biocarbonates).


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

Mark: 100

Hours: L+T+P=C

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


Unit - III

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

Unit - IV

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


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

Mark: 100

Hours: L+T+ P=C

Unit: I


Unit: II


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

Unit :V


Test Book :


Reference Books:


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

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 – Marketing of egg.
Unit V:


Test Book:


Reference

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 Form Association and Unions – Right to Movement – Right to Family –
Right to Contract – Right to Constitutional Remedies – Right to Vote and Contest in
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


Unit – IV : Human Rights Movements for Social Development


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:


THIRD SEMESTER

CORE – VIII : DEVELOPMENTAL BIOLOGY

Subject Code : 12PZO08
Mark : 100

Hours : L+T+P=C
5+0+0=3

Unit - I : Scope of Developmental Biology And Gametogenesis

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


Unit – II : Fertilization And Cleavage


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

   Philadelphia.

Unit - I : Techniques of Genetic Engineering


Unit – II : Cloning Vectors


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


Reference Books


Unit - I : Nutrition

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

Unit - II : Respiration

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

Circulation


Unit - III : 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


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


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.


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

Text Books


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

Subject Code : 12PZOP03
Mark : 100
Hours : L+T+P=C
0+0+5=6

I. Developmental Biology


2. Vital staining and Mounting of chick blastoderm of various stages.


4. Study of different types of placenta.


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.


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.


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


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


Evolution

Unit - I : Origin of life And Theories


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


Unit - I : Instrumentation

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


Haematological Techniques

Unit – II


Unit – III

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

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

Unit – V : Clinical Studies

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

Text Book


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


Unit – III : Silkworm Rearing


Unit – IV : Grainage Techniques

Unit – V : Silk Reeling


Text Books


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.


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.


5. Identification of various types of silkworms and silk moths and their external morphology.


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
Mark: 100
Hours: L+T+P=C

Unit - I


Unit - II


Unit - III


Unit - IV

Unit - V


Reference


4. Dr. G.S. SHUKLA and Dr. V.B. UPADHYAY : Economic Zoology, Rastogi Publications, Shivaji Road, Meerut – 260 002, India.


EXAMINATION

THEORY

<table>
<thead>
<tr>
<th>University Examination (UE)</th>
<th>Internal Assessment (IA)</th>
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<tbody>
<tr>
<td>75 Marks</td>
<td>25 Marks</td>
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CLASSIFICATION OF INTERNAL ASSESSMENT STRUCTURE

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<tr>
<th>Marks</th>
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<tr>
<td>Seminar - 5</td>
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<td>Test - 10</td>
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<td>Assignment - 5</td>
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<tr>
<td>Attendance - 5</td>
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<tr>
<td>Total - 25 Marks</td>
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Passing minimum (IA) – 50% - 12 marks
Passing minimum (UE) – 50% - 38 marks
Total Passing minimum - 50 marks
## PRACTICAL

<table>
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<tr>
<th>University Examination (UE)</th>
<th>Internal Assessment (IA)</th>
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<tbody>
<tr>
<td>60 Marks</td>
<td>40 Marks</td>
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</tbody>
</table>

- Passing minimum (IA) – 50% - 20 marks
- Passing minimum (UE) – 50% - 30 marks
- Total Passing minimum - 50 marks

## CLASSIFICATION OF INTERNAL ASSESSMENT STRUCTURE

40 Marks

<table>
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| 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

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<th>Time 4 hours</th>
<th>Maximum Marks 60</th>
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<td>Practical</td>
<td>50</td>
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<tr>
<td>Record</td>
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| 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

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<th>Time 4 hours</th>
<th>Maximum Marks 60</th>
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<td>Practical</td>
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<tr>
<td>Record &amp; other submissions</td>
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</table>

| 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 |
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
(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
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.

   (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.
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
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


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.

   
   (or)

   b. Give an account of vaccines and their production.
For the candidates admitted from 2012-2013 onwards

Msc., DEGREE EXAMINATION

Zoology

FIRST SEMESTER

ELECTIVE –I

FIRST AID & HOME NURSING

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?
5. Home Nursing
6. Name the instrument used to count pulse rate
7. Define blood pressure.
8. What do you mean by infection?
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.
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.


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.

   (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.
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
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.
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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 artherosclerosis
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.
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?
Part-A (10\times2 = 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?
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.

   (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.
(For the candidates admitted from 2012-2013 onwards)

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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.
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.
(For the candidates admitted from 2012-2013 onwards)

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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.
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
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, ionic 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.

   
   (or)

   b. Discuss the physiology of excretion in man.
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THIRD SEMESTER
CORE-XI
OPTIONAL SUBJECT - I - APPLIED AND STORAGE ENTOMOLOGY

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 pest 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.
(For the candidates admitted from 2012-2013 onwards)

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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 sanatorium- 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 counselling 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
(For the candidates admitted from 2012-2013 onwards)

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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 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.
(For the candidates admitted from 2012-2013 onwards)

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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 pH 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.
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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.


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.
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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.