2015-16

Zoology

NAGARJUNA GOVERNMENT COLLEGE: NALGONDA

(AUTONOMOUS)

(Re-Accredited With NAAC A-Grade)

Date: 5-10-2015

To
The Principal
NG College
NALGONDA

Sir,

Sub: Grant of Autonomous Status – Constitution of BOARD OF STUDIES in ZOOLOGY Request for Approval – Reg.

Ref: 1) No. F. 22-1/2007(AC) Dt: 3rd April 2007
2) OU Lr. Mr.69/H/2007/Acad., Dt. 12-6-2007.
3) GO RT.No.467 HE. (CE-1) Dept. Dt. 29-6-2007
4) MGU Lr. 191/MGU/NLG/2015-16, Dt. 28-8-2015.

*_*_*

With Reference to the subject cited above, I am Submitting the List of Board of Studies for Academic Years 2015-16 for your Approval.

SL.NO	Name	Designation
1	Miss. K.Neeraja, In-charge, Dept. of Zoology, Nagarjuna Govt.College Nalgonda	**Chairperson**
2	Dr.B.Reddya Naik Professor, Dept. of Zoology O.U, HYDERABAD	**University Nominee**
4	Dr. P. Nagaraja Rao Professor, Dept. of Zoology, O.U Hyderabad	**Subject Expert**
5	Dr.K.Ganesh Asst.Prof Dept.of Zoology, Nagarjuna Govt. College.Nalgonda	**Member**
6	Dr.B.Chittaranjan Rao Asst.prof Dept.of.Zoology Nagarjuna Govt. College Nalgonda	**Member**
7	V.Saritha Contract lecturer, Dept. of Zoology Nagarjuna Govt. College Nalgonda	**Member**

Submitted BY

Chairman BOS

Proposals Approved

Principal / Chair Person Acad. Council

NAGARJUNA GOVT. COLLEGE NALGONDA

(Autonomous) NAAC A GRADE

DEPARTMENT OF ZOOLOGY

BORAD OF STUDIES MEETING

The board of studies meeting of zoology department is being held on 23-09-2015 in the department of zoology under the chairmanship of Kum. K. Neeraja Head Dept. of Zoology to discuss the following agenda and formulate certain resolutions.

Agenda:

To consider and approve the syllabus for B.Sc I year, II year, III year (Semisters – I,II,III,IV,V,VI) for the academic year 2015-16 and after.

As per the instructions of the Commissioner of Collegiate Education to ensure the employability to the undergraduate students college is introducing **choice based credit system** (CBCS) by offering Interdisciplinary courses which is mandatory to all students to the pursued in any one of the semesters through the three year degree course.

The examinations are conducted semester basis each semester is of 100 marks in which 70 marks for theory and 30 marks for internal examinations 20 marks for written examination 5 marks for assignment and 5 marks for seminar.

The committee approved the model question papers for I,II,II,IV,V,VI semester each for which is for 70 marks and the practical's at the end of the year 100 marks end practical exams 50 marks project work 20 marks field work 10 marks.

The committee approved the list of paper setters for evaluation of six papers.

Members present

1. K. Neeraja BOS Chairman Dept. of Zoology, N.G. College Nalgonda.
2. Prof. Reddya Naik Dept. of Zoology, O.U, M.G. University nominee.
3. Prof. P. Nagaraja Rao Dept. of Zoology, Osmania University.
4. Dr. K. Ganesh Lecturer in Zoology, N.G. College, Nalgonda.
5. Dr. B. Chittaranjan Rao, Lecturer in Zoology, N.G. College, Nalgonda.
6. V.Saritha, Contract Lecturer in Zoology, N.G. College, Nalgonda.

PANAL OF ZOOLOGY EXAMINERS N.G. COLLEGE, NALGONDA (AUTONOMOUS)

(Autonomous, Re-Accredited by NAAC with A Grade)

The committee approved the list of examiners for paper setting and evaluation as follows:

I Semester	1. Prof. P. Nagaraja Rao (UCS, OU), Cell No. 8099047747 2. Srinivasa Sherel (Govt. Degree College, Nakrekal) Cell No. 9949496795 3. J. Narendar Reddy (K.N.M Degree College, Miryalaguda) Cell No. 8374939833
II Semester	1. J. Swamy (K.R.R College Kodad) Cell No. 984848024 2. B. Sreenivas Reddy G.D.C Jadcharla, Cell No. 9493461555 3. Srinivasa Sherel (Govt. Degree College, Nakrekal) Cell No. 9949496795
III Semester	1. Dr. T. Shanker (Narayanpet), Cell No. 2. A. Srinivas Reddy (G.D.C Siddipet) Cell No. 3. Dr. K. Madhu, Nalgonda, Cell No. 9247804932
IV Semester	1. J. Swamy (K.R.R College Kodad) Cell No. 9848480243 2. Ramesh (S.L.N.S) Bhongir, Cell No. 9440926180 3. Dattatreya Reddy (S.A.P) Vikarabad, Cell No.

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V Semester (Paper –V)	1. Dr. Heeroji Rao Bhonsle, Cell No. 2. Dr. J.Venkateshwar Rao, Asst. Prof. Dept. of Zoology Nizam College, Cell No. 7702355472 3. R. Naresh KRR Degree College, Kodad, Cell No. 8341695026 4. Dr. K. Madhu, Cell No. 9490423850
V Semester (Paper – VI)	1. Bheemlal, Cell No. 9290604255 2. Dr. J.Venkateshwar Rao, Asst. Prof. Dept. of Zoology Nizam College, Cell No. 7702355472 3. A. Suresh, Dr. BRR Govt. Degree College, Jadcharla, Cell No. 9885674402 4. P. Narendar, G.D.C, Vaneparthy, Cell No. 9440244818
VI Semester (Paper – VII)	1. Dr. K. Madhu, Nalgonda, Cell No. 9490423850 2. Dr. Heeroji Rao Bhonsle, 3. Dr. J.Venkateshwar Rao, Asst. Prof. Dept. of Zoology Nizam College, Cell No. 7702355472 4. R. Naresh KRR Degree College, Kodad, Cell No. 8341695026
VI Semester (Paper-VIII)	1. Dr. J.Venkateshwar Rao, Asst. Prof. Dept. of Zoology Nizam College, Cell No. 7702355472 2. B. Bheemlal, Cell No. 9290604255 3. S. Venkateshwarlu, Cell No. 9440867231 4. J. Narendar Reddy (K.N.M Degree College, Miryalaguda) Cell No. 8374939833

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Lecturer in Zoology
NAGARJUNA GOVT. COLLEGE
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ALLOCATION OF CREDITS AT SUBJECT LEVEL

Course: **B.Sc.** Subject: **ZOOLOGY**

S.No.	Semester	Module(Paper)	Hours	Max. Marks	Credits
1	I (Core)	**Biology of Invertebrates**	04	100	03
2	II (Core)	**Cell Biology**	04	100	03
3	Practicals-1	**Invertebrates and Cell Biology**	03	100	02
4	III(Core)	**Biology of Chordates**	04	100	03
5	IV(Core)	**Embryology, Ecology and Zoogeography**	04	100	03
6	Practicals-2	**Chordates Embryology and Ecology**	03	100	02
7	V Advanced	**Animal Physiology, Genetics and Evolution**	04	100	03
	Advanced Elective-I	**Biostatistics**	03	100	02
	Advanced Elective-II	**Biofertilizer Technology**	03	100	02
8	VI Applied	**Aquaculture, Hematology, Immunology and Human Parasitology. (Applied Biotech.)**	04	100	03
	Applied Elective-I	**Health and Hygiene**	03	100	02
	Applied Elective-II	**Vermiculture** , M.S.S	03	100	02
	Practicals-3	**Animal Physiology and Genetics**	03	100	02
	Practicals-4	**Aquaculture and Clinical Biology**	03	100	02
	TOTAL CREDITS				**30**
	Project Work	On the given topic		100	03
	*Only one Elective compulsory in Respective Semester				

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B.SC IYEAR SYLLABUS THEORY for 2015-2016

SEMISTER- I

Subject: Zoology

MODULE: Biology of Invertebrates

THEORY PAPER -I

60 Hours (4 hrs/week)

TOPICS: 1. Protozoa, Porifera and Coelenterata

1.1 Phylum Protozoa: General characters and outline classification up to classes. Type study: *Paramecium* **5 hours**

1.2 **Phylum Porifera:** General characters and outline classification up to classes. Type study: *Sycon*; Canal system in Sponges. **5 hours**

1.3 Phylum Coelenterata: General characters and outline classification up to classes. Type study: *Obelia*; Polymorphism in Coelenterates; Corals and Coral reef formation. **5 hours**

TOPICS: 2. Platyhelminthes, Nemathelminthes and Annelida

2.1phylum Platyhelminthes: General characters and outline classification up to classes. Type study: *Fasciola hepatica.* **5 hours**

2.2 Phylum Nemathelminthes: General characters and outline classification up to classes. Type study: *Ascaris lumbricoides.* **5 hours**

2.3 Phylum Annelidia: General characters and outline classification up to classes Type study: Leech; Coelom and coelomoducts in Annelids. **5 hours**

TOPICS: 3. Arthropoda and Mollusca

3.1 Phylum Arthropoda: General characters and outline classification of up to classes Type study; Prawn; Crustacean larvae; *Peripatus* – Characters and Significance. **8 hours**

3.2 Phylum Mollusca: General characters and outline classification of up to classes Type study: *Pila*; Pearl formation in Molluscans. **7 hours**

TOPICS: 4. Echinodermata to Hemichordata

4.1 Phylum Echinodermata: General characters and outline classification of up to classes. Type study: Star fish. **7 hours**

4.2 Larva of Echinodermata . **3 hours**

4.3 Hemichordata: General characters and structure and affinities of *Balanoglossus*. **5 hour**

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B.SC IYEAR SYLLABUS THEORY for 2015-2016

SEMISTER- II

Subject: Zoology

MODULE: Cell and Molecular Biology

THEORY PAPER -II

60 Hours (4 hrs/week)

TOPICS: 1. Cell Theory and Cell Structure

1.1 Cell theory **1 hour**

1.2 Ultra structure of Animal cell **4 hours**

1.3 Structure of Plasma membrane – Fluid-mosaic mode. Transport functions of Plasma membrane-Passive transport, active transport (Antiport, symport and uniport) and bulk transport. **5 hours**

1.4 Structure and functions: of Endoplasmic reticulum Golgi bodies, Ribosomes, lyososomes **5 hours**

TOPICS: 2. Cell Biology

2.1 Mitochondria: Structure and function. **3 hours**

2.2 Chromosomes – nomenclature types and structure. Giant chromosomes – Polytene and Lampbrush chromosomes. **4 hours**

2.3 Cell division – Cell-cycle stages (G1, S, G2 and M phases), Cell-cycle check points and regulation. Mitosis; Meiosis – and its significance. **8 hours**

TOPICS: 3. Carbohydrates:

3.1.1. Classification of Carbohydrates **3 hours**

3.1.2. Structure of Monosaccharides (Glucose and Fructose) **4 hours**

3.1.3. Structure of Disaccharides (Lactose and Sucrose) **4 hours**

3.1.4. Structure of Polysaccharides (Starch, Glycogen and Chitin) **4 hours**

TOPICS: 4. Proteins, Lipids and Nucleicacids

4.2.1. Amino acids: General properties, nomenclature, classification and structure. **3 hours**

4.2.2. Classification of proteins based on functions, chemical nature and nutrition, peptide bond and structure (Primary, Secondary, Tertiary and Quaternary structures) **4 hours**

4.3. Lipids: **4 hours**

4.3.1. Classification. Structure of Fatty acids (Saturated and unsaturated).

4.3.2. Triacylglycerols, Phospolipids (Lecithin and cephalin) and Steroids (Cholesterol).

4.4. Nucleic acids: **4 hour**

4.4.1. Structure of purines, pyrimidines, ribose and deoxyribose sugars.

4.4.2. Watson and Crick model of DNA – Nucleoside, Nucleotide, Chargaff's rule. Structure of RNA, Types of RNA – rRNA, tRNA and mRNA.

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(AUTONOMOUS)
DEPARTMENT OF ZOOLOGY
PRACTICAL PAPER

90 hours(3 hrs/week)

I. INVERTEBRATES:

1. Observation of the following slides / specimens / models:

Protozoa – *Elphidium, Monocystis, Paramoecium – binary fission and conjugation.*

Porifera– *Spongilla, Euspongia.*

Coelenterata– *Physalia, Velella, Corallium, Gorgonia, Aurelia, Pennatula.Obelia colony, Medusa.*

Platyhelminthes and Nemathelminthes– *Planaria, Larval stages of Fasciola, Mirachidium, Redia, Cercaria, EchinococcusgranulosusSchistosomahaematobium, Ancylostomaduodenale.*

Annelida – *Nereis, Aphrodite, Hirudo, Trochophore larva.*

Arthropoda– *Sacculina, Limulus, Julus, Scolopendra, Anopheles mouthparts (male and female),Peripatus.*

Mollusca – *Chiton, Unio, Pteredo, Sepia, Octopus, Nautilus, Glochidum larva.*

Echinodermata – *Ophiothrix, Echinus, Clypeaster, Cucumaria, Antedon, Bipinnaria larva.*

Hemichordata– *Balanoglossus, Tornaria larva.*

2. DISSECTIONS:

Prawn: Nervous system, mounting statocyst and appendages or as an alternatively

Crab/Scorpion/Locust :Digestive system

Earth worm: - Nervous system, and Reproductive system

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II. CELL BIOLOGY:

1. Identification of stages from prepared slides showing Mitosis and Meiosis.
2. Squash preparation of Onion/garlic root tip for Mitotic chromosomes.
3. Squash preparation of Grass hopper Testis for Meiotic chromosomes.
4. Identification of salivary gland chromosomes and polytene chromosomes (Photographs or figures).
5. Qualitative identification of Amino acids.

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8. 'Textbook of Invertebrates' by Kavita Juneja and H. S. Bhamrah.

Cell Biology:

1. 'Molecular Cell Biology' by Lodish, Berk, Kaiser, Scott. – Scientific American Books.
2. 'Cell and Molecular Biology' by De Robertis & De Robertis : Saunders College.
3. 'Cell Biology, Genetic Evolution an Ecology' by P.S. Varma and V. K. Agrawal; S. Chand and Company.
4. 'Molecular Biology' by Mohan P. Arror., Himalaya Publishing House Pvt. Ltd.
5. 'Manual of Laboratory Experiments in Cell Biology' – Edward Gasque: (W.C. Brouh Publishers.)
6. 'Biomolecules' by Mohan P. Arora., Himalaya Publishing House Pvt. Ltd.
7. 'Cell and Molecular Biology' – P. K. Gupta.
8. Concepts of Cell Biology' - P.S. Verma and V. K. Agarwal.
9. Biochemistry – U. Sathyanarayana and U. Chakrapani.
10. Biology – Campbell and Reece.
11. Molecular biology of the cell – Alberts et., al
12. 'Cell Biology' by S. C. Rastogi
13. 'Cell Biology by C. B. Powar, Himalayan Publications.

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CBCS MODEL QUESTION PAPER
B.Sc ZOOLOGY
SEMESTER-I
BIOLOGY OF NON CHORDATES

Time: 21/2 Hours **Max.Marks:70**

I. Answer the following questions **2x5=10**

1. Kappa particles
2. Spicules
3. Corals
4. Flame cells
5. Nephridia

II. Answer any four of the following questions **5x4=20**

6. Describe the salient futures of Protozoa
7. Write an essay on coral reef formation
8. Describe the excretory system in Leech
9. Enumerate the general characters of Arthropoda
10. Write about Peripatus
11. Write essay on Coelom

III. Answer the following questions **10x4=40**

12. a) Write about different types of cell found in Porifera

Or

b) Give an account of Crustacean larvae

13. a) Describe the life cycle of Ascaris Lumbricoides

Or

b) Explain the Polymorphism in Coelenterates

14. a) Write an essay on respiration in Pila

Or

b) Describe the Digestive system of Leech

15. a) Write about general characters of Echinodermata

Or

b) Describe the water vascular system in Echinodermata.

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CBCS MODEL QUESTION PAPER
B.Sc ZOOLOGY
SEMESTER-I1
CELLAND MOLECULAR BIOLOGY

Time: 21/2 Hours **Max.Marks:70**

I. Answer the following questions **2x5=10**

1. Lysosomes
2. Microvilli
3. Peroxisomes
4. Karyotype
5. Chitin

II. Answer any four of the following questions **5x4=20**

6. Describe the process of glycolysis
7. Write an essay on amino acids
8. Discuss Golgi complex
9. Describe functions of Mitochondria
10. Give a brief account RNA types
11. Explain the Endoplasmic reticulum

III. Answer the following questions **10x4=40**

12. a) What is Plasma membrane?List out its functions?

Or

b) Write an essay on carbohydrates.

13. a) Differentiate between Mitosis and meiosis

Or

b) Give classification of proteins based on the structure

14. a) Describe the glucose molecule structures

Or

b) Explain the structure of DNA

15. a) Explain the special types of chromosomes

Or

b) Draw a neat labeled diagram of Mitochondria and explain its structure.

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Syllabus for B.Sc Course
Subject: ZOOLOGY Theory
SEMESTER-III
Module: BIOLOGY OF CHORDATES

60 Hours (4 hrs/week)

Topics I: Protochordates and Fishes

1.1. Protochordates : Sailent features of Urochordata and Cephalochordata Structure and life history of *Herdmania*, Significance of retrogressive Metamorphosis. **6 hours**
1.2. General organization of Chordates **1hour**
1.3. General characters of Cyclostomes **1 hour**
1.4. General characters of fishes, classification up to sub-class level with examples **2 hours**
1.5. Type study – *Scoliodon*: Morphology, respiratory system, circulatory system, Excretory system, nervous system and sense organs. **7 hours**
1.6. Migration in fishes and types of scales **2 hours**

Topics II: Amphibia

2.1. General characters and classification of Amphibia up to order level **1hour**
2.2 Type study – *Rana*: Morphology, digestive system, respiratory system, circulatory System, excretory system, nervous system and reproductive system **9 hours**
2.3.Parental care in amphibians. **1 hour**

Topics III:Reptilia

3.1. General characters and classification of Reptilia up to order level. **3 hours**
3.2. Type study – *Calotes:* Morphology, digestive system, respiratory system, circulatory system, urinogenital system and nervous system. **9 hours**

Topics IV:Aves and Mammals

4.1. General characters and classification of Aves up to order level with examples. **3 hours**
4.2. Type study – Pigeon (*Columbia livia*) : Exoskeleton, respiratory system, circulating system and excretory system. **6 hours**
4.3. Significance of migration in birds **2 hour**
4.4. Flight adaptation in birds **2 hours**
4.5. General characters and classification of mammalian up to order level with examples **3 hours**
4.6 Dentition in mammals **2 hours**

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NAGARJUNA GOVT. COLLEGE, NALGONDA
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Syllabus for B.Sc Course
Subject: ZOOLOGY Theory
SEMESTER-IV
Module: EMBRYOLOGY,ECOLOGY,AND ZOOGEOGRAPHY

60 Hours (4 hrs/week)

Topics I: Embryology

1.1. Spermatogenesis,Oogenesis,and Fertilization.**3hour**
1.2. Types of eggs **3 hours**
1.3. Types of cleavages **4 hours**
1.4. Development of frog up to gastrulation and formation of primary germ layers **9 hours**
1.5. Foetal membranes and their significance **3 hours**
1.6 Placenta : types and functions **4 hours**
1.7. Regeneration with reference to Turbellarians and lizards **4 hours**

Topics II: Ecology

2.1.Scope of ecology **1 hour**
2.2. Structure of ecosystem-Biotic and abiotic factor,food chain,food web,energy flow and ecological pyramids. **2 hours**
2.3. Biogeochemical cycles or nutrient cycles – Gaseous cycles of Nitrogen and Carbon,Sedimentary cycle- phosphorus. **2 hours**
2.4. Definition of Community – Habitat and ecological niche **1 hours**
2.5.Community interactions : Brief account on Competition, predation, mutualism, commensalisms and parasitism. **3 hours**
2.6. Ecological succession: Primary and Secondary, seral stages, climax community with examples **3 hours**

Topics III: Population Ecology

3.1. Population ecology : Natality, Mortality, Density and Dispersions of animal populations **4 hours**
3.2. Growth curves and growth of animal populations –r-selected and k-selected Species **2 hours**
3.3. Population regulation mechanisms – both biotic and abiotic **2 hours**
3.4. Growth of human population its control. Future of human population **4 hours**

Topics IV: Zoogeographical Distribution

4.1. Zoogeographical realms and their characteristic fauna **7 hours**
a) Oriental realms
b) Australian realms
c) Neotropical realms
d) Ethiopian realms
e) Nearctic realms
f) Palaearctic realms

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PRACTICAL PAPER –II

(CHORDATA, EMBRYOLOGY AND ECOLOGY)

90 hrs
(3hrs/week)

Observation of the following slides / specimens / models:

1. **Protochordata :-** *Herdmania, Amphioxus, Amphioxus T.S through pharynx.*
2. **Cyclostomes:-***Petromyzon and Myxin.*
3. **Pisces:** *Pristis, Torpedo, Channa, Pleuronectes, Hippocampus, Exocoetus, Echeneis, Labeo, Catla, Clarius, Anguilla*, Scales of fishes.
4. **Amphibians:** *Ichthyophis, Amblystoma, Siren, Axolotl larva, Rana, Hyla. Alytes.*
5. **Reptilians: -** *Draco, Chamaeleon, Uromastix, Russel's viper, Naja, Krait, Enhydrina, Testudo Trionyx, Crocodile.*
6. **Aves:** -Indian roller, *Psittacula, Eudynamus, Bubo, Alcedo.*
7. **Mammalians: -** *Ornithorhynchus, Tachyglossus, Hedgehog, pteropus, Funambulus, Manis.*

DISSECTIONS:

1. V, VII, IX and X cranial nerves of *Scoliodon* or locally available fish.
2. Arterial system of *Scoliodon* or *Calotes*.

OSTEOLOGY:

1. Appendicular skeletons of *Varanus*, Pigeon and Rabbit.

EMBRYOLOGY:

1. Mounting of sperms (Grasshopper/Rat)
2. Observations of following slides / models
2.1. T.S. of testis and ovary (Rat / Rabbit / Human)
3. Different stages of cleavage (2-cell, 4-cell and 8-cell), Morula.
4. Blastula and gastrula of frog.

ECOLOGY:

1. Determination of pH in a given sample.
2. Estimation of dissolved oxygen in the given samples at different temperatures.
3. Estimation of salinity (chloride) of water in the given samples.
4. Estimation of hardness of water in terms of Carbonates, bicarbonates in the given samples

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REFERENCE BOOKS

1. 'Chordate Zoology' – E.L. Jordan and P.S. Verma, S. Chandu Publications.
2. 'Cell biology, Genetics, Evolution and Ecology'. by P.S. Verma and V.K. Agarwal., S. Chand Publishers.
3. 'Chordata – I' by Mohan P. Arora., Himalaya Publishing House Pvt. Ltd.
4. 'Text book of Zoology – Vertebrates'., by parker and Haswell.
5. 'Text book of chordates' – Kavita Juneja and H.S. Bhamrah.
6. 'A text book of Embryology' – N. Arumugam.
7. 'Chordate Embryology' by P.S. Verma and V. K. Agarwal., S. Chand and Company.
8. 'Developmental Biology – Scott. F. Gilbert.
9. 'Developmental Genetics – G.S. Miglani.
10. 'Embryology' – Mohan P.Arora.
11. 'Elements of Ecology' – Odum.
12. 'Environmental Biology' by H.R. Singh., S. Chand Publications.
13. 'Ecology' –M.P.Arora
14. 'Environmental Biology' – P.D.Sharma
15. 'Environmental Ecology' – P.R. Trivedi and Gurdeep Raj.
16. 'Ecology – Principles and Applications' – J.L Chapman and M.J.Reiss.
17. 'Biology' by Campbell & Reece.
18. Biology: The science of Life; by R.A. Wallace, G.P. Sanders & R.J. Ferl.

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PRACTICAL PAPER –II

(CHORDATE, EMBRYOLOGY AND ECOLOGY)

90 hrs
(3hrs/week)

Observation of the following slides / specimens / models:

1. **Protochordata :-** *Herdmania, Amphioxus, Amphioxus T.S through pharynx.*
2. **Cyclostomes:-***Petromyzon and Myxin.*
3. **Pisces:** *Pristis, Torpedo, Channa, Pleuronectes, Hippocampus, Exocoetus, Echeneis, Labeo, Catla, Clarius, Anguilla*, Scales of fishes.
4. **Amphibians:** *Ichthyophis, Amblystoma, Siren, Axolotl larva, Rana, Hyla. Alytes.*
5. **Reptilians: -** *Draco, Chamaeleon, Uromastix, Russel's viper, Naja, Krait, Enhydrina, Testudo Trionyx, Crocodile.*
6. **Aves: -** *Picus, Psittacula, Eudynamus, Bubo, Alcedo.*
7. **Mammalians: -** *Ornithorhynchus, Tachyglossus, Hedgehog, pteropus, Funambulus, Manis.*

DISSECTIONS:

1. V, VII, IX and X cranial nerves of *Tilapia* or locally available fish.
2. Arterial system of *Tilapia.*

OSTEOLOGY:

1. Appendicular skeletons of *Varanus*, Pigeon and Rabbit.

EMBRYOLOGY:

1. Mounting of sperms (Grasshopper/Rat)
2. Observations of following slides / models
2.1. T.S. of testis and ovary (Rat / Rabbit / Human)
3. Different stages of cleavage (2-cell, 4-cell and 8-cell), Morula.
4. Blastula and gastrula of frog.

ECOLOGY:

1. Determination of pH in a given sample.
2. Estimation of dissolved oxygen in the given samples at different temperatures.
3. Estimation of salinity (chloride) of water in the given samples.
4. Estimation of alkalinity of water in terms of Carbonates, bicarbonates in the given samples

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(AUTONOMOUS)
CBCS MODEL QUESTION PAPER
B.Sc ZOOLOGY
SEMESTER-III
BIOLOGY OF CHORDATES

Time: 21/2 Hours **Max.Marks:70**

I. Answer the following questions **2x5=10**

1. Ascidian tadpole larva
2. Dipnoi fishes
3. Air sacs
4. Sexual dimorphism in frog
5. Placoid scales

II. Answer any four of the following questions **5x4=20**

6. Describe the salient futures of Urochordata
7. Write an essay on migration of fishes
8. Describe the pulmonary respiration in frog
9. Enumerate the general characters of Reptilians
10. Write about the flight adaptations in birds
11. Write essay on dentition in mammals

III. Answer the following questions **10x4=40**

12. a) Write about retrogressive metamorphosis in herdmania and its significance

Or

b) Give a comparative account of lamprey and hag fish

13. a) Describe the different types of scales in fishes

Or

b) Explain the arterial system of scoliodon

14. a) write an essay on parental care in amphibians

Or

b) Describe the arterial system of calotes

15. a) Write about general characters of mammals

Or

b) Describe the structure of heart of a bird

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CBCS MODEL QUESTION PAPER
B.Sc-ZOOLOGY
SEMESTER-IV
EMBRYOLOGY, ECOLOGY, AND ZOOGEOGRAPHY

Time: 21/2 Hours **Max.Marks:70**

I. Answer the following questions **2x5=10**

1. Fertilization significance
2. Cleidoic eggs
3. Cleavage
4. Age pyramids
5. Nitrification

II. Answer any four of the following questions **5x4=20**

6. Describe the process of spermatogenesis
7. Write an essay on egg membranes
8. Discuss gastrulation in frog
9. Describe functions of placenta
10. Give a brief account on community interaction
11. Explain the population dispersal

III. Answer the following questions **10x4=40**

12. a) What are foetal membranes? How are they developed?

Or

b) Write an essay on placentaion in mammals.

13. a) Differentiate between spermatogenesis and oogenesis

Or

b) Give classification of eggs based on the amount of yolk

14. a) Describe the carbon bio geo chemical cycle

Or

b) Explain the ecological succession by giving an example

15. a) Explain the oriental geo graphical region

Or

b) Describe the future of human population

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Introduction of CBCS in Nagarjuna Govt. college, Nalgonda

(Autonomous)

Course: B.Sc.

GENERAL ELECTIVE from Department of ZOOLOGY

1. **Health and Hygiene**
2. **Vermiculture**
3. **NSS**

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ELECTIVE I

HEALTH AND HYGIENE

Objectives:-

To import awareness on public health and Hygiene
To create knowledge on Health Education.

UNIT – I

Scope of Public Health and Hygiene – nutrition and health – classification of foods – Nutritional deficiencies – Vitamin deficiencies.

UNIT – II

Environment and Health Hazards – Environmental degradation – pollution and associated health Hazards.

UNIT – III

Communicable diseases and their control measures such as Malaria, Dengue, Dysentery, Influenza, Polio, Chikungunya, Rabies, and AIDS.
Food borne diseases, water borne diseases, Air borne diseases, Vector borne diseases.

UNIT – IV

Non – communicable diseases and their preventive measures such as Hypertension, Coronary Heart Diseases, Stroke, Diabetes, Obesity and Mental ill – Health.

UNIT – V

Health Education in India – WHO programs – government and voluntary Organizations and their health service – Precautions first Aid and awareness on sporadic diseases (Cancer)

Reference Books:

Park and Park, 1995: Text book of preventive and social medicine – Banarsidas Bhanot Publ. jodhpur- India.
Verma, S. 1998: Medical zoology, Rastogi Publ.- Meerut- India
Singh, H.s. and Rastogi, P. 2009: Parasitology, Rastogi Publ. India.
Dubey, R.C and Maheswari, D.K. 2007: Text Book of Microbiology – S. Chand & co. Publ. New Delhi, India.

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VERMICULTURE

Objective:

To impart training on Earthworm culture technology

To create knowledge on Self - Employment opportunity

UNIT – I

Eathworm classification – Morphological and Anatomical characteristics. Biology of Lampito maruitti.

UNIT – II

Vermicomposting materials and their classification. Feeding habits and food for composting worms.

UNIT – III

Vermicomposting methods such as – Small scale and large scale pit method, heap method, window method etc., factors affecting vermicomposting such as pH, Moisture, temperature etc.

UNIT – IV

Vermicomposting: General procedure in Homes. Maintenance of vermicomposting beds. Harvesting the worms. Earthworm Predators, parasites and pathogens.

UNIT – V

Application of Vermicomposting in Agriculture and Horticultural practices. Advantage of Vermicomposting.

Reference Books:

Edwards, C.A., and Bother, B. 1996: Biology of Earthworms – Chapman Hall Publ. Co., London.

Ismail, S.A. 1997: Vermitechnology – the Biology of Earthworms – Orient Longman Publ. – India.

Ranganathan, L.S. 2006: Vermibiotechnology from soil health to Human health – Agrobios – India.

Talashikar, S.C. 2008: Earthworms in Agriculture – Agrobios - India

Gupta, P.K. 2008: Vermicomposting for sustainable agriculture [2nd edition] – Agrobios – India.

TEMPLATE
COURSE CURRICULUM

For Introducing
NATIONAL SERVICE SCHEME (NSS)
As an elective subject in Higher Education

Submitted by
Ministry of Youth Affairs and Sports
Govt. of India

NSS SYLLABUS FOR HONOURS/PASS/GENERAL COURSES
(Four Common Semesters)

SEMESTER-I

PAPER-01

Theory Weight – 60
Practical/Project work – 40

No. of Lectures (35)

Unit – 01: Introduction and Basic Concepts of NSS (4)

a) History, philosophy, aims & objectives of NSS (1)
b) Emblem, flag, motto, song, badge etc. (1)
c) Organizational structure, roles and responsibilities of various NSS functionaries (2)

Unit – 02: NSS Programmes and Activities (10)

a) Concept of regular activities, special camping, Day Camps (3)
b) Basis of adoption of village/slums, Methodology of conducting Survey (2)
c) Financial pattern of the scheme (1)
d) Other youth prog./schemes of GOI (2)
e) Coordination with different agencies (1)
f) Maintenance of the Diary (1)

Unit – 03: Understanding Youth (5)

a) Definition, profile of youth, categories of youth (2)
b) Issues, challenges and opportunities for youth (2)
c) Youth as an agent of social change (1)

Unit – 04: Community Mobilisation (9)

a) Mapping of community stakeholders (3)
b) Designing the message in the context of the problem and the culture of the community (1)
c) Identifying methods of mobilisation (3)
d) Youth-adult partnership (2)

Unit – 05: Volunteerism and Shramdan (7)

a) Indian Tradition of volunteerism (1)
b) Needs & importance of volunteerism (2)
c) Motivation and Constraints of Volunteerism (2)
d) Shramdan as a part of volunteerism (2)

Project work/Practical **40 Marks**

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NSS SYLLABUS FOR HONOURS/PASS/GENERAL COURSES
(Four Common Semesters)

SEMESTER–II

PAPER–02

Theory Weight – 60
Practical/Project work – 40

No. of Lectures (35)

Unit – 01: Importance and Role of Youth Leadership (6)

a) Meaning and types of leadership (2)
b) Qualities of good leaders; traits of leadership (2)
c) Importance and role of youth leadership (2)

Unit – 02: Life Competencies (11)

a) Definition and importance of life competencies (2)
b) Communication (3)
c) Inter Personal (3)
d) Problem-solving and decision-making (3)

Unit – 03: Social Harmony and National Integration (9)

a) Indian history and culture (2)
b) Role of youth in peace-building and conflict resolution (5)
c) Role of youth in Nation building (2)

Unit – 04: Youth Development Programmes in India (9)

a) National Youth Policy (3)
b) Youth development programmes at the National Level, State Level and voluntary sector (4)
c) Youth-focused and Youth-led organisations (2)

Project work/Practical **40 Marks**

Conducting surveys on special theme and preparing a report thereof.

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NSS SYLLABUS FOR HONOURS/PASS/GENERAL COURSES
(Four Common Semesters)

SEMESTER–III

PAPER–03

Theory Weight – 60
Practical/Project work – 40

No. of Lectures (35)

Unit – 01: Citizenship (7)

a) Basic Features of Constitution of India (2)
b) Fundamental Rights and Duties (2)
c) Human Rights (1)
d) Consumer awareness and the legal rights of the consumer (1)
e) RTI (1)

Unit – 02: Family and Society (6)

a) Concept of family, community, (PRIs and other community-based organisations) and society (2)
b) Growing up in the family – dynamics and impact (1)
c) Human values (1)
d) IV) Gender justice (2)

Unit – 03: Health, Hygiene & Sanitation (7)

a) Definition, needs and scope of health education (1)
b) Food and Nutrition (1)
c) Safe drinking water, water borne diseases and sanitation (Swachh Bharat Abhiyan) (2)
d) National Health Programme (2)
e) Reproductive health (1)

Unit – 04: Youth Health (6)

a) Healthy Lifestyles (1)
b) HIV AIDS, Drugs and Substance abuse (2)
c) Home Nursing (1)
d) First Aid (2)

Unit – 05: Youth and Yoga (9)

a) History, philosophy and concept of Yoga (2)
b) Myths and misconceptions about yoga (1)
c) Different Yoga traditions and their Impacts (2)
d) Yoga as a preventive, promotive ,and curative method (2)
e) Yoga as a tool for healthy lifestyle (2)

Project work/Practical **40 Marks**

Preparation of research project report.

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NSS SYLLABUS FOR HONOURS/PASS/GENERAL COURSES
(Four Common Semesters)

SEMESTER–IV

PAPER–04

Theory Weight – 60
Practical/Project work – 40

No. of Lectures (35)

Unit – 01: Environment Issues (11)

a) Environment conservation, enrichment and Sustainability (2)
b) Climate change (2)
c) Waste management (2)
d) Natural resource management (5)
(Rain water harvesting, energy conservation, waste land development, soil conservations and afforestation)

Unit – 02: Disaster Management (7)

a) Introduction to Disaster Management, classification of disasters (4)
b) Role of youth in Disaster Management (3)

Unit-03: Project Cycle Management (10)

a) Project planning (2)
b) Project implementation (3)
c) Project monitoring (2)
d) Project evaluation: impact assessment (3)

Unit – 04: Documentation and Reporting (7)

a) Collection and analysis of data (3)
b) Preparation of documentation/reports (2)
c) Dissemination of documents/reports (2)

Project work/Practical **40 Marks**

Workshops/seminars on personality development and improvement of communication skills

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NSS SYLLABUS FOR PASS/GENERAL COURSES

SEMESTER–V

PAPER–05

Theory Weight – 60
Practical/Project work – 40

No. of Lectures (35)

Unit – 1: Vocational Skill Development (20)

This Unit will aim to enhance the employment potential of the NSS volunteers or, alternately, to help them to set up small business enterprises. For this purpose, a list of 12 to 15 vocational skills will be drawn up, based on the local conditions and opportunities. Each volunteer will have the option to select two skill-areas out of this list – one such skill in each semester. The education institution (or the university) will make arrangements for developing these skills in collaboration with established agencies that possess the necessary expertise in the related vocational skills.

Unit – 02: Entrepreneurship Development (8)

a) Definition & Meaning (1)
b) Qualities of good entrepreneur (2)
c) Steps/ways in opening an enterprise (3)
d) Role of financial and support service Institutions (2)

Unit – 03: Youth and Crime (7)

a) Sociological and Psychological Factors influencing Youth Crime (2)
b) Peer Mentoring in preventing crimes (1)
c) Awareness about Anti-Ragging (1)
d) Cyber Crime and its Prevention (2)
e) Juvenile Justice (1)

Project work/Practical **40 Marks**

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NSS SYLLABUS FOR PASS/GENERAL COURSES

SEMESTER–VI

PAPER–06

Theory Weight – 60
Practical/Project work – 40

No. of Lectures (35)

Unit – 1: Vocational Skill Development (20)

This Unit will aim to enhance the employment potential of the NSS volunteers or, alternately, to help them to set up small business enterprises. For this purpose, a list of 12 to 15 vocational skills will be drawn up, based on the local conditions and opportunities. Each volunteer will have the option to select two skill-areas out of this list – one such skill in each semester. The education institution (or the university) will make arrangements for developing these skills in collaboration with established agencies that possess the necessary expertise in the related vocational skills.

Unit – 02: Civil/Self Defense (5)

a) Civil defense services, aims and Objectives of civil defense (2)
b) Needs for Self defense training (3)

Unit-03: Resource Mobilisation (3)

a) Writing a Project Proposal (2)
b) Establishment of SFUs (1)

Unit-04: Additional Life Skills (7)

a) Positive Thinking (1)
b) Self Confidence and Self Esteem (2)
c) Setting Life Goals and working to achieve them (2)
d) Management of Stress including Time Management (2)

Project work/Practical **40 Marks**

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B.SC IIIYEAR SYLLABUS THEORY 2015-2016

SEMISTER- V

Module: ANIMAL PHYSIOLOGY

THEORY PAPER –V

TOPICS. I - Physiology of Digestion and Physiology of respiration **20 hours**

1.1 Definition of digestion and types of digestion – extra and intracellular.
1.2 Digestion of Carbohydrates, proteins, lipids and cellulose digestion.
1.3 Absorption and assimilation of digested food materials.
1.4 Gastrointestinal hormones – control of digestion.
1.5 Types of respiration – external and internal respiration.
1.6 Structure of mammalian lungs and gaseous exchange.
1.7 Transport of oxygen – formation of oxy-hemoglobin and affinity of hemoglobin for Oxygen, Oxygen dissociation curves.
1.8 Transport of CO_2 – Chloride shift, Bohr effect.
1.9 Cellular respiration – Main steps of glycolysis, Kreb's cycle, electron transport, Oxidative phosphorylation and ATP production (Chemosmotic theory).

TOPICS. II - Physiology of Circulation and Physiology of Excretion **20 hours**

2.1 Open and closed circulation.
2.2 Structure of mammalian heart and its working mechanism – Heartbeat and cardiac cycle. Myogenic and neurogenic hearts.
2.3 Regulation of heart rate – Tachycardia and Bradycardia.
2.4 Definition of excretion.
2.5 Forms of nitrogenous waste material and their formation: classification of animals on the basis of excretory products.
2.6 Gross organization of mammalian excretory system and structure of kidney.
2.7 Structure and function of Nephron – Counter current mechanism.

TOPICS. III - Physiology of muscle contraction and Physiology of nerve impulse **10 hours**

3.1 General structure and types of muscles.
3.2 Ultra structure of skeletal muscle.
3.3 Sliding filament mechanism of muscle contraction.
3.4 Chemical changes during muscle contraction – role of calcium, ATP utilization and its Replenishment.

TOPICS. IV - Physiology of nerve impulse **10 hours**

4.1 Structure of nerve cell.
4.2 Nature of nerve impulse – resting potential and action potential. Properties of nerve impulse – threshold value, refractory period, all or none response.
4.3 Conduction of nerve impulse along an axon – local circuit theory and salutatory conduction theory.
4.4 Structure of synapse, mechanism of synaptic transmission – electrical and chemical transmissions.

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B.SC IIIY EAR SYLLABUS THEORY 2015-2016
SEMISTER- V (ANIMAL PHYSIOLOGY)
PRACTICAL PAPER –V

ANIMAL PHYSIOLOGY **90 hours**

1. Identification of carbohydrates, proteins and lipids.
2. Unit Oxygen Consumption in an aquatic animal (fish or crab
3. Quantitative analysis of excretory products.
4. Demonstration of salivary amylase

REFERENCE BOOKS

1. 'Essentials of Animal Physiology' by S.C.Rastogi'
2. 'Animal Physiology' by H.C. Nigam.
3. 'Biology' by Campbell & Reece.
4. 'Animal Physiology' – Agarwal, R.A. Srivastava, Kaushal, Anil and Kumar.
5. 'Animal Physiology and Biochemistry' by Dr. B.Annadurai.
6. 'Principles of Animal Physiology' by Christopher D.Moyes, Patricia M Schulte.
7. 'Biology: The Science of Life' by R.A. Wallace, G.P. Sanders & R.J. Ferl.
8. 'Biology: Concepts and Applications' by Starr

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SEMISTER- VI

Module: ANIMAL PHYSIOLOGY,GENETICS &EVOLUTION

THEORY PAPER –VII

TOPICS. I- Physiology of Endocrine system **20 hours**

1.1 Relationship between hypothalamus and pituitary gland.
1.2 Hormones of hypothalamus.
1.3 Hormones of Adenohypophysis and Neurohypophysis.
1.4 Hormones of pineal gland, thyroid gland, parathyroid, thymus, adrenal and pancreas.
1.5 Endocrine control of mammalian reproduction – Male and female hormones – Hormonal control of menstrual cycle in humans

TOPICS. II – Physiology of Homeostasis **10 hours**

2.1 Concept of homeostasis and its basic working mechanism.
2.2 Mechanism of Homeostasis – giving three illustration viz., Hormonal control of glucose levels, Water and ionic regulation by freshwater and marine animals and temperature regulation in man.

TOPICS. III – Genetics **20 hours**

3.1. Mendel's laws – Law of segregation and independent assortment;
3.2. Genetic interactions –Incomplete dominance, Co-dominance and epitasis.
3.3. Identification of DNA as the genetic material – Griffith's experiment and Hershey – Chase experiment.
3.4. Central dogma of molecular biology – Brief account of DNA replication (Semiconservative method), Replication fork (Continuous and discontinuous synthesis);
3.5. Transcription – Brief account initiation, elongation and termination in eukaryotes;
3.6. Translation; Genetic code; gene regulation as exemplified by Lac operon.

TOPICS. IV - Organic Evolution: **10 hours**

4.1. Human karyotyping, bar bodies and Lyon hypothesis and Amniocentesis chromosomal disorders – Autosomal and sex chromosomes
4.2. Genetic basis of Evolution, Gene pool and gene frequencies, Hardy-Weinberg's Law, Force of destabilization, natural selection, genetic drift, Mutation, Isolation and Migration.
4.3. Speciation – Allopatric and sympatric.

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B.SC III YEAR SYLLABUS 2015-2016
SEMISTER- VI (**GENETICS**)
PRACTICAL PAPER –VII

GENETICS **90 hours**

1. A, B, O blood group identification
2. Problems based on Blood grouping.
3. Karyotyping of human chromosomes (Human karyotype figure on paper should be cut in todifferent sets of chromosomes and students are asked to arrange them in an order and comment on the ideogram)
4. Identification of genetic syndromes given on charts.
5. Problems based on Mendelian inheritance (at least one problem for each for the laws of segregation and law of independent assortment).

REFERENCE BOOKS

1. 'Essentials of Animal Physiology' by S.C.Rastogi'
2. 'Animal Physiology' by H.C. Nigam.
3. 'Biology' by Campbell & Reece.
4. 'Animal Physiology' – Agarwal, R.A. Srivastava, Kaushal, Anil and Kumar.
5. 'Animal Physiology and Biochemistry' by Dr. B.Annadurai
6. 'Genetics' Vol-I. by C.B.Powar., Himalaya Publishing House Pvt.Ltd.
7. 'Genetics' by Strickberger.
8. 'Genetics' by P.K. Gupta.
9. ' Cell Biology, Genetics, Evolution and Ecology' by P.S.Varma and V.K. Agrawal;
10. 'Principles of Genetics' by Gardner, Simmons & Smustard.
11. 'Principles of Genetics' by H. Robert & Tamasin.
12. 'Genetics' by P.S.Verma & V.K.Agarwal.
13. 'Organic Evolution' by M.P.Arora & Chandrakanta.
14. 'Organic Evolution' by N.Arumugam.
15. ' Animal nutrition' by P.Mc Donald, R.A. Edwards, J.F.D. Greenhalgh, C.A. Morgan.

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NAGARJUNA GOVT. COLLEGE, NALGONDA.
(Autonomous)
B.SC III YEAR SYLLABUS THEORY 2015-2016
SEMISTER- V
Module: FISHERIES, AQUACULTURE AND HEMATOLOGY
THEORY PAPER –VI

TOPICS. I - Fisheries **10 hours**

1.1. Capture fisheries – Introduction
1.2. Types of fisheries, Fishery resources from Freshwater, Brackish water and Marine habitats.
1.3. Finfish and shell fisheries.
1.4. Fishing gears and fishing crafts.

TOPICS. II – Aquaculture **20 hours**

2.1. Freshwater, Brackish water and Marine culture.
2.2 Site selection criteria 1.7. Aquaculture systems.
2.3. Induced breeding.
2.4. Hatchery design and Management, Seed transportation
2.5. Larval rearing – Nursery ponds, rearing and grow out ponds
2.6. Shrimp and Prawn culture
2.7. Common diseases of fish & their control.

TOPICS. III – Harvesting Technology **10 hours**

3.1. ~~Hatchery systems, Seed transport, common diseases and control~~
3.2. Post-harvest technology
3.3. Preservation and processing – Freezing, solar drying, Canning, salting smoking, By product of fish cool mineral

TOPICS. III – Hematology **20 hours**

4.1. Blood composition and functions
4.2. Blood groups and transfusion problems
4.3. Blood diseases – Anemia, Leukemia, Leukocytosis, Leucopoenia
4.4. Biopsy and – Clinical importance.
4.5. Autopsy – Clinical importance.

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SEMISTER- VI
Module: IMMUNOLOGY&ANIMAL BIOTECHNOLOGY
THEORY PAPER –VIII

TOPICS, I- Immunology **20 Hours**

1.1. Types of immunity – Innate and acquired
1.2. Antigens – Haptenes and epitopes and their properties
1.3. Structure and biological properties of human immunoglobulin G (IgG)
1.4. Hypersensitivity – immediate and delayed

TOPICS, I- Important Human parasites **10 Hours**

2.1. Blood parasites (structure and Clinical significance of *Plasmodium*).
2.2 Intestinal parasites – Structure and clinical significance *Entamoeba, Giardia, Taenia solim, Ancylostoma, Enterobius*

TOPICS, III-Animal Biotechnology **15 Hours**

3.1. Animal Biotechnology: Scope of Biotechnology, Cloning vectors – Characteristics of vectors, Plasmids.
3.2. Gene Cloning – Enzymatic cleavage of DNA, Restriction enzymes (Endonucleases) and Ligation

TOPIC, IV-Transgenic Animals **15 Hours**

4.1. Trans genesis and Production of transgenic animals (Fish and Goat).
4.2. Application of Stem Cell technology in cell based therapy (Diabetes and Parkinson's diseases)

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B.SC III YEAR SYLLABUS 2015-2016
SEMISTER- V
(FISHERIES, AQUACULTUREAND PARASITES)
PRACTICAL PAPER –VI

FISHERIES AND AQUACULTURE **90 hours**

1.0. Identification of important Freshwater and Marine edible fishes (Minimum 10)
2.0. Identification of important edible prawns (Minimum 5)

FIELD WORK:

Field work is compulsory. Field trip to local fisheries / aquaculture unit is to be conducted and certified field note book should be submitted at the time of practical examination.

CLINCIAL SCIENCE:

1.0. Identification of the following protozoan parasites.
a) Entamoeba histolytica
b) Giardia intestinalis
c) Balantidium coli
d) Trypanosoma gambiense
e) Plasmodium – Any two stages

2.0. Identification of the following helminth parasites.
a) Taenia solium
b) Ascaris (Male and female)
c) Enterobius vermicularis
d) Dracanculus medinenesis
e) Ancylostoma duodenale

REFERENCE BOOKS

1. The fishes of India-Francis Day.Vol-I and II.Wiliam dawson & sons Ltd.1958
2. Fish and fisheries of india-V.G.jhingram,Hindustan publishing company..1958
3. Aquaculture productivity-V.R.P.Sinha and H.C siaslara Oxford IBH,1991.
4. Advances in aquaculture-T.V.R.Pillay and M.A Dill..,Fishing news books Ltd,.1979
5. Essentials of Immunology-Ivanriots
6. NMS Immunology-Richard M.Hyde
7. Immunology-I.Kannan.
8. Medical zoology-Sobti

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SEMISTER- VIII (CLINICAL SCIENCE& ANIMAL BIOTECHNOLOGY)
PRACTICAL PAPER –VIII

CLINICAL SCIENNCE **90 hours**

1. Blood cell counting – RBC and WBC
2. Estimation of Hemoglobin (Sahali's Method)

ANIMAL BIOTECHNOLOGY:

1. Identification of vectors (charts or photographs)
2. Identification of Genetic disorders (charts or photographs)
Identification of transgenic animals (charts or photographs)

REFERENCE BOOKS

1.Essentials of Immunology-Ivanriots

2.NMS Immunology-Richard M.Hyde

3.Immunology-I.Kannan.

4.Medical zoology-Sobti

5.Parasitology-Chandler

6.Eleemts of Biotechnology-P.K.Gupta

7.Molecular Biotechnology-Glick and Pasternak

8.Genomics and Biotechnology-P.K.Gupta

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Model question paper

B.SC IIIYEAR 2015-2016

SEMISTER- V (ANIMAL PHYSIOLOGY)

Paper-V

Max.Marks:40

Answer the following questions. Draw a neat labeled diagram wherever necessary.

Section-A

4X8=32 Marks

1. a) Explain briefly the physiology of digestion.
   (or)
   b) Write about the transport of gases in the respiration process.

2. a) Explain in detail the structure and functions of heart.
   (or)
   b) Write about the structure and function of kidney.

3. a) Explain the muscle contraction in detail.
   (or)
   b) Write a note on chemistry of muscle contraction.

4. a) Write about the synaptic transmission.
   (or)
   b) Describe the structure of a neuron and explain its functional properties.

Section-B

Answer the any four questions. **4x2=8 Marks**

5. Pepsin.
6. Chloride shift.
7. Bohr effect.
8. Myogenic heart.
9. Nephron.
10. ACH
11. Active potential.
12. Axon.

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Model question paper

B.SC IIIYEAR 2015-2016

SEMISTER- VI (FISHERIES,AQUACULTURE AND ,HAEMATOLOGY)

PAPER-VI **Max.Marks:40**

Answer the following questions. Draw a neat labeled diagram wherever necessary.

Section-A **4X8=32 marks**

1. a) Describe the fin fishes
   (or)
   b) Explain the Brackish water fishery resource in India.

2. a) Give an account on induced breeding in carps.
   (or)
   b) Give an account of prawn culture.

3. a) Describe any two diseases generally occurring fishes.
   (or)
   b) Write a note on preservation and processing of the fishes.

4. a) describe the blood composition and functions.
   (or)
   b) Explain two blood diseases.

Section-B **4x2=8 Marks**

Answer the any questions.

5. Caste net.
6. Mari culture.
7. Nursery ponds.
8. Caning.
9. Biopsy.
10. Blood transfusion.
11. Platelets.
12. Trap net.

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Model question paper

B.SC IIIYEAR 2015-2016

SEMISTER- VI (ANIMAL PHYSIOLOGY GENETICS & EVOLUTION)

Paper-VII **Max.Marks:40**

Answer the following questions. Draw a neat labeled diagram wherever necessary.

Section-A **4X8=32 Marks**

1. a) Write about the structure and functions of pituitary gland.
   (or)
   b) Write about the hormonal control in reproduction.

2. a) Write an essay on thermoregulation in human beings
   (or)
   b) Define homeostasis explain the same in different organisms.

3. a) Explain briefly about the DNA replication
   (or)
   b) Write about the Oparan concept.

4. a) Write about the chromosomal disorders
   (or)
   b) Explain the natural selection theory.

Section-B

4x2=8 Marks

Answer the any four questions.

5.Neuro Hypophysis
6. Thymus
7.Homeo statasis
8. Alleles
9. Genotype
10.Incomplete dominance
11.Barrbodies
12. Sex chromosomes

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Model question paper

B.SC IIIYEAR 2015-2016

SEMISTER- VI (IMMUNOLGOY AND ANIMAL BIOTECHNOLGOY)

Paper-VIII **Max.Marks:40**

Answer the following questions. Draw a neat labeled diagram wherever necessary.

4X8=32 Marks

Section-A

1. a) What is immunity? Describe the innate and acquired immunity
   (or)
   b) Describe the structure of immunoglobulin Ig G and write properties.

2. a) Write about any two of intestinal parasites.
   (or)
   b) Explain the structure and clinical significance of plasmodium

3. a) Describe briefly the scope of Biotechnology.
   (or)
   b) what is gene cloning ? Describe briefly

4. a) what is trans genesis? Briefly write about it in fishes
   (or)
   b) Explain briefly about the application of stem cells in diabetes.

Section-B

4x2=8 Marks

Answer the any four questions.

5.Antigens.
6.Entamoeba.
7.Plasmids.
8. Endonucleases
9.ligases
10.parkinson's disease
11.Ancylostoma
12..Delayed hypersensitivity

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