2014-15

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NAGARJUNA GOVT. COLLEGE NALGONDA
(Autonomous) NAAC A GRADE

DEPARTMENT OF ZOOLOGY

S.No	Number	Category	Nature	Name & Designation	Address/Mail/ Phone	Remarks
1	1 Incharge Dept	Chairman	Appointed by Principal			
2	All faculty members of the Dept	Members	Nominated by Principal	1 K. Neeraja H.O.D Dept. of Zoology Chairman B.O.S	N.G. College 9396614002	
				2. Dr. K. Ganesh, Lecturer	9849079303	
				3. Dr. B. Chittaranjan Rao, Lecturer	9440785877	
				4. B. Saritha, Contract Lecturer	9542727418	
				5. R. Shyam Sundar, Guest Faculty	9885337258	
3.	2 subject experts	Members	Nominated by Academic Council	1. Prof. T. Nagaraju, Chairman B.O.S. Dept. Of Zoology O.U.		
				2. Prof. M.D. Masood Hussain	8008517950	
4.	1 University Nominee	Member	Nominated by VC on recommendation of the Principal	Prof. K. Rudrama Devi Dept. of Zoology O.U	8179080659	
5	1 Industry	Member	Nominated by Principal			
6	IPG Meritorious Alumnus	Member	Nominated by Principal/Coopted by Chairman BOS by the approval of Principal			

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OSMANIA UNIVERSITY
HYDERABAD

Prof. K. Rudrama Devi
Dept. of Zoology
Osmania University,
Hyderabad.

Submitted for approval

Incharge/Chairman BOS council

Proposals Approved

Principal/Chairman academic

Principal
Nagarjuna Govt. College
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NAGARJUNA GOVT. COLLEGE NALGONDA
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DEPARTMENT OF ZOOLOGY

BOARD OF STUDIES MEETING

The board of studies meeting of zoology department is being held on 23-04-2014 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.

Agneda:
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 2014-15 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)** this academic year by offering Interdisciplinary courses which is mandatory to all students to be pursued in any one of the semisters 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, III, IV, V, VI semester each of which is for 70 marks and the practicals at the end of the year 100 marks end practical exams 70 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. Kum. K.Neeraja Chairman Board of Studies, Dept. of Zoology, N.G. College Nalgonda.
2. Prof. K. Rudrama Devi Dept. of Zoology, O.U, M.G. university nominee.
3. Prof. Md. Masood Hussain Dept. of Zoology, O.U.
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
7. Mr. R. Shyam Sundar, Guest Faculty in Zoology, N.G. College, Nalgonda.

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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
VII 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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Introduction of CBCS in Nagarjuna Govt. College, Nalgonda (Autonomous)

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 ElectiveII	**Instrumentation**	03	100	02*
8	VI Applied	**Aquaculture, Haematology, Immunology, Human parasitology**	04	100	03
	Applied Elective I	**Sericulture**	03	100	02*
	Applied Elective II	**Poultry**	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 is compulsory in Respective Semester.				

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NAGARJUNA GOVT. COLLEGE, Nalgonda

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Syllabus for B.Sc. Course

Subject: ZOOLOGY Theory

Semester-I

Module: BIOLOGY OF INVERTEBRATES

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 Coelenterate: General characters and outline classification up to classes. Type study: *Obelia*; Polymorphism is Coelenterates; Corals and Coral reef formation. **7 hours**

Topics: 2.Platyhelminthes, Nematehelimenthes and Annelida

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

2.2 Phylum Nemateheliminthes: General characters and outline classification up to classes. Type study: *Ascaris lumbricoides.* **3 hours**

2.3 Phylum Annelidia: General characters and outline classification up to classes Type study: Leech; Coelom and coelomoducts in Annelida **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. **10 hours**

3.2 Phylum Mollusca: General characters and outline classification of up to classes Type study: *Pila*; Pearl formation in Molluses. **8 hours**

Topics: 4. Echinodermata and Hemichordata

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

4.2 General characters of Hemichordata: structure and affinities of *Balanoglossus.* **5 hours**

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NAGARJUNA GOVT. COLLEGE, Nalgonda

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Syllabus for B.Sc. Course

Subject: ZOOLOGY Theory

Semester-II

Module: CELL BIOLOGY

60 Hours (4 hrs/week)

Topics:1. Cell Structure

1.1 Cell theory: Proposed theories for Cell **1 hour**

1.2 Animal cell Structure: Ultra structure of Animal cell and cell organelles **4 hours**

Topics:2. Structure and Functions of Cell Orgenells

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

2.2 Structure and functions: Endoplasmic reticulum, Golgi body, Ribosomes, lyososomes and Mitochondria. **8 hours**

2.3 Chromosomes: Nomenclature types and structure. Giant chromosomes – Polytene and Lampbrush chromosomes. **4 hours**

2.4 Cell division: Cell-cycle stages (G_1, S, G_2 and M phases), Cell-cycle check points and regulation. Mitosis; Meiosis – and its significance. **4 hours**

Topics:3. Biomolecules of the Cell-I

3.1. Carbohydrates: 3.1.1Classification 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**

4.2. Proteins: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**

Topics.4. Biomolecules of th Cell-II

4.1. Lipid: Classification. Structure of Fatty acids (Saturated and unsaturated). Triacylglycerols, Phospolipids (Lecithin and cephalin) and Steroids (Cholesterol). **4 hours**

4.2. Nucleic acids: Structure of purines, pyrimidines, ribose and deoxyribose sugars. Watson and Crick model of DNA – Nucleoside, Nucleotide, Chargaff's rule. Structure of RNA, Types of RNA – rRNA, tRNA and mRNA. **4 hours**

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PRACTICAL PAPER – I

90 hrs

(3 hrs/week)

INVERTEBRATES:

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

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

Porifera – *Spongilla, Euspongia.*

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

Platyhelminthes and Nemathelminthes – *Planaria, Larval stages of Fasciola, Mirachidium, Redia, Cercaria, Echinococcus granulosus Schistosoma haematobium, Ancylostoma duodenale.*

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

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

Peripatus.

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

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

Hemichordata – *Balanoglossus, Tornaria larva.*

2. DISSECTIONS:

Leech: Reproductive and excretory system, Mounting Jaws and Nephridia.

Prawn: Nervous system, mounting statocyst and appendages or as an alternatively crab/Scorpion/locust (digestive system)

Union or *Pila:* Nervous system, Mounting radula of *Pila.*

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.

REFERENCE BOOKS

Biology of Invertebrates:

1. 'The Invertebrates' by L. H. Hyman. Vol I, II and V. – M.C. Graw Hill Company Ltd.
2. 'Invertebrate Zoology' – A functional Evolutionary approach. Ruppert, Fox and Barnes., Thomas publishers. Indian Edition.
3. 'Invertebrate Zoology' by E. L. Jordan and P.S. Verma., S. Chand and Company.
4. 'Invertebrate Zoology' by R. D. Barnes : W. B. Sauwonders CO., 1986.
5. 'Invertebrate structure and Function' by Barrington. E. J. W., ELBS.
6. 'A student text book of Zoology' by Sedgwick, A., Vol-I, II and III – Central Book Depot, Allahabad.
7. 'A text book of Zoology' by Parker, T. J. and Haswell, W. A., Mac Millan Co. London.

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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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Introduction of CBCS in Nagarjuna Govt. College, Nalgonda (Autonomous)

Course: **B.Sc.**

GENREAL ELECTIVE from **Department of ZOOLOGY**

1. Anthropology
2. Nutrition and Health Care
3. Ornamental Fisheries
4. Vermiculture and Biofertilizer culture
5. Bioinformatics

Neeraja

K. Rudrama Devi 15/5/2014

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Introduction of CBCS in
NAGARJUNA GOVT. COLLEGE, (Autonomous), Nalgonda
Tentative Scheme of Evaluation for a semester
B.Sc.

Subject: ZOOLOGY

Module

1. Theory

   Max. Marks: 100

   Distribution of Marks

   a). End semester exam: 70

   b). Internal exam: 20

   c).Co-curricular activities: 10

2. Practicals

   Max. Marks: 100

   Distribution of Marks

   a). End practical exam: 70

   b). Project work: 20

   c).Field work: 10

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Introduction of CBCS in

NAGARJUNA GOVT. COLLEGE, (Autonomous), Nalgonda

Model Question Paper

B.Sc., ZOOLOGY

Semester-I, Biology of Invertebrate

Time: 2&1/2 hours **Max. Marks:70**

I. Answer all the questions **5x2=10 marks**

1. What is Tube feet?
2. Write about Contractile vacuole.
3. What is Cyclosis?
4. In which animal Blastostyle?
5. Where does clitellum exists?

II. Answer any four of the following Questions **4x5=20 marks**

6. Write about cytoplasmic particles in Paramecium.
7. What is polymorphism? Give examples.
8. Draw diagram of a Flame cell and explain.
9. Give details of pathogeny caused by Ascaris
10. Write Peripatus characters.
11. What is radula

III. Answer all the Questions **4x10=40 marks**

12. a) Describe the conjugation in paramecium

OR

b) Write the general characters of porifera and give outline classification up to classes

13. a) Describe the excretory system in fasciola hepatica

OR

b) Narrate the life cycle of Ascaris lumbricoides

14. a) Describe the charaters of peripatus and add note on its significance

OR

b) Writ about the pearl formation in Molluscans

15. a) Write about the water vascular system in star fish

OR

b) Write the general Characters of Hemichordata.

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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: Salient features of Urochordata and Cephalochordata Structure and lifehistory of *Herdmania*, Significance of retrogressive Metamorphosis. **6 hours**

1.2. General organization of Chordates **1 hour**

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 scales in fishes 2 **hours**

Topics II. Amphibia

2.1 General characters and classification of Amphibia up to order level. **1 hour**

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 hours**

4.4. Flight adaptation in birds **2 hours**

4.5. General characters and classification of Mammalia 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. **3 hours**
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 factore, 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 hour**
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 and its control. Future of human population. **4hours**

Topics IV. Zoogeography

4.1. Zoogeographical realms **6 hours**
a) Oriental realms
b) Australian realms
c) Neotropical realms
d) Ethiopian realms
e) Nearctic realms
f) Palaearctic realms

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PARCTICAL PAPER – II

90 hrs

(3hrs/week)

CHORDATE, EMBRYOLOGY AND ECOLOGY

Observation of the following slides / specimens / models:

1. ***Protochordata*** *: Herdmania, Amphioxus, Amphioxus T.S through pharynx.*
2. ***Cyclostomata*** *: Petromyzon and Myxine.*
3. ***Pisces*** *: Pristis, Torpedo, Channa, Pleuronectes, Hippocoampus, Exocoetus, Echeneis, Labeo, Catla, Clarius, Anguilla, Scales of fishes.*
4. ***Amphibia*** *: Ichthyophis, Amblystoma, Siren, Axolotl larva, Rana, Hyla. Alytes.*
5. ***Reptilia****: Draco, Chamaeleon, Uromastix, Russels viper, Naja, Krait, Enhydrina, Testudo, Trionyx, Crocodile.*
6. ***Aves****: Picus, Psittacula, Endynamis, Bubo, Alcedo.*
7. ***Mammalia****: Ornithorhynchus, Tachyglossus, Hedgehog, pteropus, Funambulus, Manis.*

DISSECTIONS:

1. *V, VII, IX and X cranial nerves of Soliodon 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~~ alkalinity 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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NAGARJUNA GOVT. COLLEGE, Nalgonda

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B.Sc. III YEAR SYLLABUS THEORY 2014-15

Subject: ZOOLOGY

Semester-V

UNIT I

1.0. Physiology of Digestion 7 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.

Physiology of respiration 8 hours

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 oxyhaemoglobin and affinity of haemoglobin 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 phosporylationa and ATP production (Chemosmotic theory).

UNIT II

2.0. Physiology of Circulation 7 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.

Physiology of Excretion 8 hours

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.

UNIT III

3.0. Physiology of muscle contraction 7 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.

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UNIT- IV Physiology of nerve impulse 8 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 III year Syllabus Theory 2014-15

Semester-VI (ANIMAL PHYSIOLOGY, GENETICS & EVOLUTION)

Theory Paper- VII

UNIT-I

Physiology of Endocrine system 8 hours

1.1 Relationship between hypothalamus and pituitary gland.

1.2 Hormones of hypothalamus.

1.3 Hormones of Adenohypophysis and Neurohypophsis.

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

UNIT-II

Physiology of Homeostasis

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.

UNIT III

3.0. Genetics

3.1. Mendel's laws – Law of segregation and independent assortment; Genetic interactions – Incomplete dominance, codominance and epitasis. **3 hours**

3.2. Identification of DNA as the genetic material – Griffith's experiment and Hershey – Chase experiment. **4 hours**

3.3. Central dogma of molecular biology – Brief account of DNA replication (Semiconservative method), Replication fork (Continous and discontinous synthesis);
Transcription – Brief account initiation, elongation and termination in eukaryotes;
Translation; Genetic code; gene regulation as exemplified by lac operon. **8 hours**

3.4. Human karyotyping, barr bodies and Lyon hypothesis and Amniocentesis chromosomal disorders – Autosomal and sex chromosomes **5 hours**

UNIT- IV

Organic Evolution:

4.1. Genetic basis of Evolution, Gene pool and gene frequencies, Hardy-Weinberg's Law, Force of destabilization, natural selection, genetic drift, Mutation, Isolation and Migration. **8 hours**

4.2. Speciation – Allopatry and sympatry. **2 hours**

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PRACTICAL PAPER - III

ANIMAL PHYSIOLOGY, GENETICS & EVOLUTION

90 hrs

(3hrs/week)

ANIMAL PHYSIOLOGY

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

GENETICS

5. A, B, O blood group identification
6. Problems based on Blood grouping.
7. Karyotyping of human chromosomes (Human karyotype figure on paper should be cut in to different sets of chromosomes and students are asked to arrange them in an order and comment on the ideogram)
8. Identification of genetic syndromes given on charts.
9. 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. '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
9. 'Genetics' Vol-l. by C. B. Powar., Himalaya Publishing House Pvt. Ltd.
10. 'Genetics' by Strickberger.
11. 'Genetics' by P. K. Gupta.

13

12. 'Cell Biology, Genetics, Evolution and Ecology' by P. S. Varma and V. K. Agrawal; S. Chand and Company.
13. 'Principles of Genetics' by S. B. Basu and M. Hossain.
14. 'Principles of Genetics' by Gardner, Simmons & Smustard.
15. 'Principles of Genetics' by H. Robert & Tamasin.
16. 'Genetics' by P. S. Verma & V. K. Agarwal.
17. 'Organic Evolution' by M. P. Arora & Chandrakanta.
18. 'Organic Evolution' by N. Arumugam.
19. 'Animal nutrition' by P. Mc Donald, R. A. Edwards, J. F. D. Greenhalgh, C. A. Morgan.

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B.SC III YEAR SYLLABUS THEORY 2015-2016

SEMISTER- V

Module: FISHERIES, AQUACULTURE AND HEMATOLOGY

THEORY PAPER –VI (ELECTIVE)

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.

1.5.

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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B.Sc III year Syllabus Theory 2014-15

Semester-VI (FISHERIES, AQUACULTURE AND HEMATOLOGY)

Theory Paper- VI

UNIT I

1.0. Fisheries and Aquaculture

1.1. Capture fisheries – Introduction **1 hour**

1.2. Types of fisheries, Fishery resources from Freshwater, Brackish water and Marine habitats. **2 hours**

1.3. Finfish and shell fisheries. **2 hours**

1.4. Fishing gears and fishing crafts. **2 hours**

1.5. Freshwater, Brackish water and Mariculture. **5 hours**

1.6. Site selection criteria. **2 hours**

UNIT II

2.1. Aquaculture systems. **3 hours**

2.2 Induced breeding. **2 hours**

2.3. Hatchery design and Management **2 hours**

2. 4 Larval rearing – Nursery ponds, rearing and grow out ponds **2 hours**

2.5 Shrimp and Prawn culture **2 hours**

UNIT III

2.6 Hatchery systems, Seed transport, common diseases and control **2 hours**

2.7 Post-harvest technology **1 hour**

2.8 Preservation and processing – Freezing, solar drying, Canning, salting smoking, By product of fish cool mineral **2 hours**

UNIT- IV

4.0. Clinical Science

4.1. Hematology 8 hours

4.2 Blood composition and functions

4.3 Blood groups and transfusion problems

4.4 Blood diseases – Anemia, Leukemia, Leucocytosis, Leucopaenia

4.5 Biopsy and autopsy – Clinical importance.

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B.Sc III year Syllabus Theory 2014-15

Semester-VI (IMMUNOLOGY & ANIMAL BIOTECHNOLOGY)

Theory Paper- VIII

UNIT-I

1. Immunology 12 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

UNIT-II

2. 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*

UNIT –III

3.0.Animal Biotechnology:

3.1. Animal Biotechnology: Scope of Biotechnology, Cloning vectors – Characteristics of vectors, Plasmids. **8 hours**

3.2. Gene Cloning – Enzymatic cleavage of DNA, Restriction enzymes (Endonucleases) and Ligation **10 hours**

UNIT- IV

4.1 Transgenesis and Production of transgenic animals (Fish and Goat). **6 hours**

4.2 Application of Stem Cell technology in cell based therapy (Diabetes and Parkinson's diseases) **6 hours**

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PARCTICAL PAPER – IV

90 hrs

(3 hrs/week)

FISHERIES AND AQUACULTURE

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

3.0. Blood cell counting – RBC and WBC

4.0. Estimation of Haemoglobin (Sahi's Method)

ANIMAL BIOTECHNOLOGY:

1.0. Identification of vectors (charts or photographs)

5.0. Identification of Genetic disorders (charts or photographs)

Identification of transgenic animals (charts or photographs)

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REFERENCE BOOKS

1. 'Immunology' 5th edition, 2003, - R. A. Goldsby, T. J. Kindt, B. A. Osborne and J. Kuby. W. H. Freemann and Company, Newyork.
2. 'Essentials of Immunology' – Ivanriots.
3. 'A text book of Immunology and Immunotechnology' by B. Annadurai, S. Chand Publicatins.
4. ' Principles of Immunology' N.V. Shastri., Himalaya Publishing hOuse Pvt. Ltd.
5. 'Genetic Engineering' by Mohan P. Arora., Himalayan Publishers
6. 'Practical Immunology' – Talwar.
7. 'Introduction to basic Molecular Biology Techniques' by G. R. Naik, Himalaya Publishing House Pvt. Ltd.
8. 'Immunology' – I. Kannan.
9. 'NMS Immunology' – Richard M. Hyde.
10. 'Text book of Immunology' – C. V. Rao.
11. 'Biology' – Campbell and Reece.
12. 'Medical Zoology' – Sobti.
13. 'Parasitology' – Chandler
14. 'Elements of Biotechnology' – P. K. Gupta.
15. 'Genomics and Biotechnology' – P. K. Gupta.
16. 'Molecular Biotechnology' – Glick and Pasternak.
17. 'The Fishes of India' – Francis Day. Vol – I & II. William dawson & Sons Ltd, 1958.
18. 'General and Applied Ichthyology' (Fish and Fisheries) S. K. Gupta and P. C. Gupta., S. Chand Publishers
19. 'Fish and fisheries of India' – V. G. Jhingran, Hindustan publishing company., 1985
20. Aquaculture productivity – V. R. P. Sinha and H. C. Siaslara Oxford IBH, 1991.
21. Advances in aquaculture – T. V. R. Pillay and M. A. Dill., Fishing news Books Ltd., 1979.

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Faculty of Sciences

B.Sc. **II Yr. IV** Semester-End Examination, Mar/Apr 2014

ZOOLOGY - IV

Time: 2 ½ Hrs. Max.Marks: 40

SECTION - A **(4 x 8 = 32)**

Answer the following questions. Draw neat labelled diagrams (whenever necessary)

ఈ క్రింది ప్రశ్నలకు సమాధానములు వ్రాయుము. అవసరమైన చోట పటమును గీయుము.

1. (a) Giving the general structure of egg, describe various types of eggs laid by the females.
అండము యొక్క సాధారణ నిర్మాణమును వివరించి స్త్రీ జీవుల ద్వారా ఉత్పత్తి చేసే వివిధ రకముల అండాలను గురించి వ్రాయుము.

(or)

(b) What is fertilization and describe process of fertilization.
ఫలదీకరణమనగానేమి? ఫలదీకరణ విధానమును వివరించుము.

2. (a) What are foetalmembranes explain about Allantois.
పిండ బాహ్యత్వచములు అనగానేమి. అల్లాంటమును విశదీకరించుము.

(or)

(b) Define Regeneration. Explain with reference to turbellarians.
పునరుత్పత్తిని నిర్వచించి, టర్బల్లేరియాలలో పునరుత్పత్తి ప్రక్రియను వివరించుము.

3. (a) Define Biogeochemical cycles. Explain Nitrogen cycle.
జీవభూరసాయన వలయాలను నిర్వచించి నత్రజని వలయమును వివరించుము.

(or)

(b) What is ecological succession. Explain the types of ecological successions.
జీవావరణ అనుక్రమము అనగానేమి? జీవావరణ అనుక్రమములో రకాల గురించి వివరించుము.

4. (a) Describe the growth of human populations and its control mechanism.
మానవ జనాభా పెరుగుదల నియంత్రణ చర్యలను వివరించుము.

(or)

(b) Explain about Ethiopian Region.
ఇథియోపియన్ ప్రాంతము గురించి వ్రాయుము.

SECTION - B **(4 x 2 = 8)**

Answer any four questions.

ఈ క్రింది వానిలో ఏవేని 4 ప్రశ్నలకు సమాధానములు వ్రాయుము.

5. Oogenesis. (అండోత్పత్తి)
6. Caudal autotomy (పుచ్ఛీయ స్వయంవిచ్ఛిత్తి)
7. Yolksac. (సొన సంచి)
8. Producers. (ఉత్పత్తిదారులు)
9. Growth curves (వృద్ధి రేఖలు)
10. Symbiosis (సహజీవనము)
11. Biotic fotentials (జీవసామర్థ్యము)
12. Oriental region (ఓరియంటల్ ప్రాంతము)

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B.Sc. **III Yr. V** Semester (Bac & Imp) Examination, Mar/Apr 2014

ZOOLOGY

Paper - VI

Time: 2 ½ Hrs. Max.Marks: 40

SECTION - A (4 x 8 = 32)

Answer the following questions. Draw neat labelled diagrams (whenever necessary)

ఈ క్రింది ప్రశ్నలకు సమాధానములు వ్రాయుము. అవసరమైన చోట పటమును గీయుము.

1. (a) Write about fishinig crafts.
చేపలు పట్టుటలో ఉపయోగించబడు పడవలను (ఫిషింగ్ క్రాఫ్ట్స్) వివరించుము.

(or)

(b) What are the different types of nets used in catching fishes.
చేపలను పట్టుటకు ఉపయోగించు వివిధ రకముల వలలను గూర్చి వ్రాయుము.

2. (a) Write in detail the culture of prawns.
రొయ్యల పెంపకము గూర్చి వివరముగా వ్రాయుము.

(or)

(b) Write an account on the methods of preserving the fishes and prawns.
చేపలను మరియు రొయ్యలను నిలువచేసే వివిధ పద్ధతులను గూర్చి వ్రాయుము.

3. (a) Describe the hatchary system and write about the fish seeds transportation.
చేపల సంతాన ఉత్పత్తి కేంద్రములను వివరించి చేపల విత్తన రవాణ గూర్చి వ్రాయుము.

(or)

(b) Write about the common diseases of fishes.
చేపలకు సామాన్యంగ సంభవించు వ్యాధులను గూర్చి వ్రాయుము.

4. (a) Write the composition and functions of blood.
రక్త సంఘటనను వివరించి దీని విధులను గూర్చి వ్రాయుము.

(or)

(b) Wht is anemia? Write about various types of anemia and symptoms.
రక్తహీనత అనగానేమి? వివిధ రకాల రక్తహీనతలను వివరించి వాని లక్షణములను వ్రాయుమ.

SECTION - B (4 x 2 = 8)

Answer any four questions.

ఈ క్రింది వానిలో ఏవేని 4 ప్రశ్నలకు సమాధానములు వ్రాయుము.

5. Biopsy. (బయోప్సి)
6. Neutrophils. (న్యూ ట్రోఫిల్స్)
7. Salting. (సాల్టింగ్)
8. Fin Fisheries. (ఫిన్ ఫిషరిస్)
9. Leukemia. (ల్యూకేమియా)
10. O Blood group. (O రక్త వర్గము)1
11. Reservoirs. (జలాశయము)
12. Nursary ponds. (నర్సరీ చెరువులు)

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Model question paper

B.SC IIIYEAR 2012-2013

SEMISTER- VI (ANIMAL PHYSIOLOGY)

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

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

Section-A (4X8=32)

2. 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 (4x2=8)

Answer the any four questions.

5. Pepsin.

6. Chloride shift.

7.Bohreffect.

8.Myogenic heart.

9. Nephron.

10. ACH

11. Active potential.

12. Axon.

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Model question paper

B.SC IIIYEAR 2012-2013

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)

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)

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 2012-2013

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)**

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 Oparin concept.

4. a) Write about the chromosomal disorders

   (or)

   b) Explain the natural selection theory.

Section-B
(4x2=8)

Answer the any four questions.

5.Neuro hypophysis

6. Thymus

7.Homeo statasis

8.Alleles

9. Genotype

10.Incomplete dominance

11.Bar bodies

12.Sex chromosomes

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Model question paper

B.SC IIIYEAR 2012-2013

SEMISTER- VI (IMMUNOLGOY AND ANIMAL BIOTECHNOLGOY)

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

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

Section-A (4X8=32)

2. 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 transgenesis? Briefly write about it in fishes

(or)

b) Explain briefly about the application of stem cells in diabetes.

Section-B

(4x2=8)

Answer the any four questions.

5.Antigenes.

6.Entamoeba.

7.Plasmids.

8.Endonucleases

9.ligases

10.parkinsons disease

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Code No.336/10

Faculty of Science

B.Sc. II Yr. III Semester-End Examination, November 2010

ZOOLOGY - III

Time: 2 ½ Hrs. Max.Marks: 40

SECTION - A (4 x 8 = 32)

Answer the following questions.
ఈ క్రింది ప్రశ్నలకు సమాధానములు వ్రాయుము.

Z 00 - 3

1. (a) Write the retrogressive metamorphosis in herdmania.
హెర్డ్‌మేనియాలో తరోగమన రూపవిక్రియ వివరింపుము.
(OR)
(b) Write the general characters of cephalochordata and give classification briefly.
సిఫెలో ఆర్డేటా సాధారణ లక్షణములు తెలిపి సంక్షిప్తముగా దాని వర్గీకరణను తెలుపుము.

2. (a) Write the general characters of cyclostomes.
సైక్లోస్టోమ్స్ సాధారణ లక్షణములు వ్రాయుము.
(OR)
(b) Describe the circulatory system in scoliodon.
స్కోలియోడాన్ లో రక్తప్రసరణ వ్యవస్థ వర్ణించుము.

3. (a) Explain the structure and physiology of kidney in frog.
కప్పలో మూత్రపిండము నిర్మాణము మరియు పనిచేయు విధానము తెలుపుము.
(OR)
(b) Write the respiratory system in Calotes.
తొండలో శ్వాస వ్యవస్థను వ్రాయుము.

4. (a) Write the flight adaptations in birds.
పక్షులలో ఎగురుటకు ఉపయోగపడు లక్షణములను వివరించుము.
(OR)
(b) Describe the dentition in mammals.
క్షీరదములలో దంత విన్యాసము వర్ణించుము.

SECTION - B (4 x 2 = 8)

Answer any four questions.
ఈ క్రింది వానిలో ఏవేని 4 ప్రశ్నలకు సమాధానములు వ్రాయుము.

5. Fins. (పాఙములు)
6. Neotany. (శాఖ జననము)
7. Thecodant. (గర్తికాదంతములు)
8. Quill feather. (క్విల్ ఈక)
9. Marsupial pouch. (మార్సూపియల్ కోశము)
10. Echidna. (ఎకిడ్నా)
11. Pericardiam. (పెరికార్డియమ్)
12. Crokadelia. (క్రోకడీలియా)

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