



ZOOLOGY

SYLLABUS

FOR

2020-2021

BOARD OF STUDIES MEETING

2020 -2021

SRI Y.N. COLLEGE (AUTONOMOUS)
NARSAPUR

ZOOLOGY SYLLABUS

W.E.F. 2015-16 (REVISED IN APRIL, 2016)

SRI Y.N.COLLEGE (AUTONOMOUS)

(Affiliated to Adikavi Nannaya University)
Thrice Accredited by NAAC with 'A' Grade
Recognized by UGC as 'College with Potential for Excellence'
NARSAPUR - 534 275

BOARD OF STUDIES IN ZOOLOGY FOR THE YEAR 2020 – 2021

MEETING NOTICE

A meeting of the members on Board of Studies of the Department held on **25-06-2020** at **02.00 P.M. through online (Zoom)** to discuss the following Agenda.

AGENDA:

1. To prepare the syllabus (modified up to 10%) and model question papers (CBCS) for II & III year for the academic year 2020 - 2021.
2. To suggest methodologies for innovative methods of teaching.
3. To promote Research, Teaching, Extension and other academic activities in the Department.
4. To prepare the syllabi and model question papers for Certificate Courses/Add on courses.
5. To discuss the topics of study projects for final year students.
6. Allotment of internal marks for student assignments, mid semester examination for the continuous internal assessment in CBCS pattern.
7. Any other matters with permission of the chair.

You are cordially invited to attend the meeting and make it a success.

Yours Sincerely

PRINCIPAL

SRI Y.N.COLLEGE (AUTONOMOUS)

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NARSAPUR - 534 275

MEMBERS OF THE BOARD

The Board of Studies for Zoology for the year 2020 – 2021 is constituted with the following members.

- | | | |
|-----------------------------|--------------|----------|
| 1. Dr. T.V.V. Satyanarayana | In-charge | Chairman |
| 2. Ms. K.S.S.V.N. Lakshmi | Lecturer | Member |
| 3. Smt. G. Sunitha | Lecturer | Member |
| 4. Dr. N.H.K. Durga Prasad | Lecturer | Member |
| 5. Ms. Ch. G. Bhavani | Demonstrator | Member |

University Nominee

Dr. K. Ramaneswari
Associate Professor
Dept. of Zoology
UCST, ANUR

Members from other College

1. Dr. B. Padmaja
DNR College (A)
BHIMAVARAM
2. Sri. K. Rama Krishna
SKSD Mahila Kalasala
TANUKU

Industry

Sri M. Radha Krishna Murthy
Asst. ASM, N.G. Feeds Pvt. Ltd.
ARUGOLANU

Alumni Member

Sri Kotipalli Srinivasa Murthy
Advocate
NARSAPUR

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BOARD OF STUDIES IN ZOOLOGY FOR THE YEAR 2020 – 2021

RESOLUTIONS:

The members present and discussed about the syllabus relating to III to VI semester including Practical in Zoology and proposed the following resolutions.

Resolution 1: Resolved to approve the syllabus for III, IV, V & VI semesters for 2020 - 2021 as appended herewith.

Resolution 2: Resolved to approve the Model Papers, Schemes, and Blue Prints etc.

Resolution 3: Resolved to conduct Students Seminars, Quiz Competition, Students assignments as a part of other academic activities of the department for the year 2020 - 2021.

Resolution 4: Resolved to conduct Field Trips, Study Tours for I, II and III year students to enrich their knowledge in the subject concern.

Resolution 5: Resolved to give authorization to the Chairman to implement the syllabus for I and II Semesters prescribed by the APSCHE in toto or with slight modifications.

(Dr. T.V.V. SATYANARAYANA)
CHAIRMAN & HOD

DEPARTMENT OF ZOOLOGY

ZOOLOGY SYLLABUS FOR I SEMESTER ZOOLOGY - PAPER - I

ANIMAL DIVERSITY – BIOLOGY OF NONCHORDATES

Hours: 60

Max. Marks: 75

UNIT – I

- 1.1 Principles of Taxonomy – Binomial nomenclature – Rules of nomenclature
- 1.2 Whittaker's five kingdom concept and classification of Animal Kingdom.

PHYLUM PROTOZOA

- 1.3 General characters and Classification up to classes with suitable examples
- 1.4 Locomotion, Nutrition and Reproduction in Protozoans
- 1.5 *Elphidium* (type study)

UNIT - II

PHYLUM PORIFERA

- 2.1 General characters and Classification up to classes with suitable examples
- 2.2 Skeleton in Sponges
- 2.3 Canal system in sponges

PHYLUM COELENTERATA

- 2.4 General characters and Classification up to classes with suitable examples
- 2.5 Metagenesis in *Obelia*
- 2.6 Polymorphism in Coelenterates
- 2.7 Corals and coral reef

PHYLUM CTENOPHORA

- 2.8 General characters and Evolutionary significance (Affinities)

UNIT - III

PHYLUM PLATYHELMINTHES

- 3.1 General characters and Classification up to classes with suitable examples
- 3.2 Life cycle and pathogenicity of *Fasciola hepatica*
- 3.3 Parasitic adaptations in Helminthes

PHYLUM NEMATHELMINTHES

3.4 General characters and Classification up to classes with suitable examples

3.5 Life cycle and pathogenicity of *Ascaris lumbricoides*

UNIT - IV

PHYLUM ANNELIDA

4.1 General characters and Classification up to classes with suitable examples

4.2 Evolution of Coelom and Coelom ducts

4.3 Vermiculture – Scope, Significance, Earthworm species, processing, Vermicompost, economic importance of vermicompost

PHYLUM ARTHROPODA

4.4 General characters and Classification up to classes with suitable examples

4.5 Vision and respiration in Arthropoda

4.6 Metamorphosis in Insects

4.7 *Peripatus* - Structure and affinities

4.8 Social life in Bees and Termites

UNIT – V

PHYLUM: MOLLUSCA

5.1 General characters and Classification up to classes with suitable examples

5.2 Pearl formation in Pelecypoda

5.3 Sense organs in Mollusca

PHYLUM: ECHINODERMATA

5.4 General characters and Classification up to classes with suitable examples

5.5 Water vascular system in star fish

5.6 Larval forms of Echinodermata

PHYLUM HEMICHORDATA

5.7 General characters and Classification up to classes with suitable examples

5.8 *Balanoglossus* - Structure and affinities

CO-CURRICULAR ACTIVITIES (SUGGESTED)

Preparation of charts/models of Phylogenetic Tree of Life, 5-kingdom classification, *Elphidium* life cycle etc.

Visit to Zoology museum or Coral island as part of Zoological tour

Charts on life cycle of *Obelia*, Polymorphism, Sponge Spicules

Preparation of charts on life cycle of *Fasciola* and *Ascaris*

DEPARTMENT OF ZOOLOGY

ZOOLOGY MODEL PAPER FOR I SEMESTER ZOOLOGY - PAPER - I

ANIMAL DIVERSITY – BIOLOGY OF NONCHORDATES

Time: 3 hrs

Max. Marks: 75

I. Answer any FIVE of the following. Draw labeled diagrams wherever necessary. 5 x 5 = 25 M

1. Sponges – స్పంజికలు
2. Coral reef – ప్రవాళావరోధము
3. Parasites – పరాన్నజీవులు
4. Coelom – శరీర కుహరము
5. Crustacea – క్రస్టేషియా
6. Pelecypoda – పెలిసిపోడ
7. Cucumaria – కుకుమేరియా
8. Bipinnaria Larva – బైపిన్నేరియా డింభకము

II. Answer any FIVE of the following. Draw labeled diagrams wherever necessary. 5 x 10 = 50 M

8. Give an account on life history of *Elphidium*.
ఎల్ఫీడియం జీవిత చరిత్రను గూర్చి వ్రాయుము.

OR

Write an essay on Canal system in Sponges.

స్పంజికలలో కుల్యా వ్యవస్థను గూర్చి ఒక వ్యాసము వ్రాయుము.

9. Describe the Polymorphism in Coelenterates.
సీలెంటిరేటా జీవులలో బహురూపకతను గూర్చి వర్ణింపుము.

OR

Give an account on general characters of phylum Ctenophora.

టీనోఫోరా వర్గము యొక్క సాధారణ లక్షణములను గూర్చి వ్రాయుము.

10. Describe the pathogenicity of *Fasciola hepatica*.

పాసియోలా హిపాటికా వ్యాధి సంక్రమణను గూర్చి వర్ణింపుము.

OR

Write an essay on Vermiculture.

వెర్మికల్చర్ ను గూర్చి ఒక వ్యాసము వ్రాయుము.

11. Give an account on structure and affinities of *Peripatus*.

పెరిపేటస్ జీవి నిర్మాణము మరియు సంబంధ భాంధవ్యాలను గూర్చి వ్రాయుము.

OR

Write an essay on Torsion in gastropoda.

గాస్ట్రోపోడా జీవులలో మెలితిరుగు విధానమును గూర్చి ఒక వ్యాసము వ్రాయుము.

12. Describe the water vascular system in star fish.

సముద్ర నక్షత్రములో జల ప్రసరణ వ్యవస్థను గూర్చి వర్ణింపుము.

OR

Give an account on structure and affinities of *Balanoglossus*.

బెలనోగ్లోసస్ జీవి యొక్క నిర్మాణము మరియు సంబంధ భాంధవ్యాలను గూర్చి వ్రాయుము.

DEPARTMENT OF ZOOLOGY

ZOOLOGY PAPER FOR I SEMESTER ZOOLOGY - PAPER - I

ANIMAL DIVERSITY – BIOLOGY OF NONCHORDATES

Time: 3 hrs

Max. Marks: 75

BLUE PRINT

Unit No.	Essay Questions	Short Questions	Marks allotted to the Unit	Remarks
Unit – 1	2	1	25	2 Essay Questions
Unit – 2	2	1	25	2 Essay Questions
Unit – 3	2	2	30	2 Essay Question
Unit – 4	2	2	30	2 Essay Questions
Unit – 5	2	2	30	2 Essay Questions
Total Marks including Choice				140

Note: - The Question Paper setters are requested to adhere to the format given above.

DEPARTMENT OF ZOOLOGY

ZOOLOGY PRACTICAL SYLLABUS FOR I SEMESTER ZOOLOGY - PAPER – I

ANIMAL DIVERSITY - BIOLOGY OF NONCHORDATES

Periods: 24

Max. Marks: 50

1. Study of museum slides/Specimens/models (Classification of animals up to orders)

Protozoa: *Amoeba*, *Paramoecium*, *Paramecium* - Binary fission and conjugation, *Vorticella*, *Entamoeba histolytica*, *Plasmodium vivax*.

Porifera: *Sycon*, *Spongilla*, *Euspongia*, *Sycon*, *Sycon* - T.S & L.S. Spicules, Gemmule.

Coelenterata: *Obelia* - Colony & Medusa, *Aurelia*, *Physalia*, *Velella*, *Corallium*, *Gorgonia*, *Pennatula*.

Platyhelminthes: *Planaria*, *Fasciola hepatica*, *Fasciola* larval forms - Miracidium, Redia, Cercaria, *Echinococcus granulosus*, *Taenia solium*.

Nemathelminthes: *Ascaris* (Male & Female), *Dracunculus*, *Ancylostoma*, *Wuchereria*.

Annelida: *Neries*, *Aphrodite*, *Chaetopterus*, *Hirudinaria*, Trochophore larva.

Arthropoda: Cancer, Palaemon, Scorpion, *Scolopendra*, *Sacculina*, *Limulus*, *Peripatus*, Larvae – Nauplius, Zoea, Mysis, Mouth parts of male & female *Anopheles* and *Culex*, Mouthparts of Housefly and Butterfly.

Mollusca: *Chiton*, *Pila*, *Unio*, *Pteredo*, *Murex*, *Sepia*, *Loligo*, *Octopus*, *Nautilus*,
Glochidium larva

Echinodermata: *Asterias*, *Ophiothrix*, *Echinus*, *Clypeaster*, *Cucumaria*, *Antedon*,
Bipinnaria larva

Hemichordata: *Balanoglossus*, Tornaria larva

2. Dissections:

1. Prawn: Appendages, Digestive system, Nervous system, Mounting of Statocyst.
2. Insect: Mouth Parts.
3. Laboratory Record work shall be submitted at the time of practical examination.
4. An "Animal Album" containing photographs, cutouts, with appropriate write up about the above mentioned taxa. Different taxa/topics may be given to different sets of students for this purpose.
5. Computer – aided techniques should be adopted or show virtual dissections.

DEPARTMENT OF ZOOLOGY

ZOOLOGY PRACTICAL MODEL PAPER FOR I SEMESTER
ZOOLOGY - PAPER – I

ANIMAL DIVERSITY – BIOLOGY OF NONCHORDATES

TIME: 3 Hrs.

Max. Marks: 50

I. Draw a neat labeled diagram of Nervous system of Prawn or Digestive system of Prawn.
10 + 5 = 15 M

II. Mounting of Statocyst/Appendages of Prawn or Mouth parts of an Insect (Labeled Diagram only)
10 M

III. Identify, Sketch and Comment on
5 x 3 = 15 M

A

B

C

D

E

IV Record + Viva
10 M

Total

50

DEPARTMENT OF ZOOLOGY

ZOOLOGY SYLLABUS FOR II SEMESTER
ZOOLOGY - PAPER – II

ANIMAL DIVERSITY – BIOLOGY OF CHORDATES

Periods: 60

Max. Marks: 75

UNIT - I

- 1.1 General characters and classification of Chordata up to classes
- 1.2 Protochordata – Salient features of Cephalochordata, Affinities of Cephalochordata.
- 1.3 Salient features of Urochordata
- 1.4 Structure and life history of Herdmania
- 1.5 Retrogressive metamorphosis – Process and Significance

UNIT - II

- 2.1 Cyclostomata, General characters, Comparison of *Petromyzon* and *Myxine*
- 2.2 Pisces - General characters of Fishes
- 2.3 *Scoliodon*: External features, Digestive system, Respiratory system, structure and functions of Heart, Structure and functions of the Brain.
- 2.4 Migration in Fishes
- 2.5 Types of Scales
- 2.6 Dipnoi

UNIT - III

- 3.1 General characters of Amphibia
- 3.2 Classification of Amphibia up to orders with examples.
- 3.3 *Rana hexadactyla*: External features, Digestive system, Respiratory system, Structure and functions of Heart.
- 3.4 Reptilia: General characters of Reptilia, Classification of Reptilia up to orders with examples.
- 3.5 Classification of Reptilia up to orders with examples
- 3.5 *Calotes*: External features, Digestive system, Respiratory system, Structure and function of Heart, Structure and function of Brain
- 3.6 Identification of Poisonous snakes and skull in reptiles.

UNIT – IV

AVES:

- 4.1 General characters of Aves

- 4.2 *Columba livia*: External features, Digestive system, Respiratory system. Structure and function of Heart, Structure and function of Brain
- 4.3 Migration in Birds
- 4.4 Flight adaptation in birds

UNIT – V

- 5.1 General characters of Mammalia
- 5.2 Classification of Mammalia up to sub - classes with examples
- 5.3 Comparison of Prototherians, Metatheria's and Eutherians
- 5.4 Dentition in mammals

Co-curricular activities (suggested)

Preparation of charts on Chordate classification (with representative animal photos) and retrogressive metamorphosis.

Thermocol or Clay models of Herdmania and Amphioxus.

Visit to a local fish market and identification of local cartilaginous and bony fishes.

Thermocol models of fish heart and brain.

Collecting and preparation of Museum specimens with dead frogs/snakes/lizards etc.

Chart preparation for Dentition in mammals.

DEPARTMENT OF ZOOLOGY

ZOOLOGY MODEL PAPER FOR II SEMESTER

ZOOLOGY - PAPER – II

ANIMAL DIVERSITY – BIOLOGY OF CHORDATES

Time: 3 hrs

Max. Marks: 75

I. Answer any FIVE of the following. Draw labeled diagrams wherever necessary. 5 x 5 = 25 M

1. Urochordata – యూరోకార్డేట
2. *Myxine* – మిక్సీన్
3. *Draco* – డ్రాకో
4. Identification of Poisonous Snakes - విష సర్పములను గుర్తించుట
5. Quil feather – క్వీల్ ఈక
6. Migration – వలస
7. Mammalian characters – క్షీరద లక్షణములు
8. Prototheria – ప్రోటోథీరియా

II. Answer any FIVE of the following. Draw labeled diagrams wherever necessary. 5 x 10 = 50 M

9. Explain the general characters of chordates
సకశేరుక జీవుల సాధారణ లక్షణములను గూర్చి వివరింపుము.

OR

Describe the life history of *Herdmania*
హెర్డ్మేనియా జీవిత చరిత్రను గూర్చి వర్ణింపుము.

10. Describe the structure and functions of heart of *Scoliodon*.
సొరిచేప గుండె నిర్మాణము మరియు విధులను గూర్చి వర్ణింపుము.

OR

Write an essay on Migration in Fishes.
చేపలలో వలస విధానమును గూర్చి ఒక వ్యాసము వ్రాయుము.

11. Describe the Respiratory system of *Rana hexadactyla*
కప్ప శ్వాస వ్యవస్థను గూర్చి వర్ణింపుము.

OR

Explain the structure and functions of Brain in *Calotes*.
తొండ మెదడు నిర్మాణము మరియు విధులను గూర్చి వివరింపుము.

12. Give an account on Digestive system of *Columba livia*
పావురము యొక్క జీర్ణ వ్యవస్థను గూర్చి వ్రాయుము.

OR

Write an essay on flight adaptations in birds

పక్షులలో ఉడ్డయక అనుకూలనాలను గూర్చి ఒక వ్యాసము వ్రాయుము.

13. Compare the characters of Metatheria and Eutheria

మెటాథీరియా మరియు యూథీరియా లక్షణములను పోల్చుము.

OR

Write an essay on dentition in mammals

క్షీరదాలలో దంత విన్యాసమును గూర్చి ఒక వ్యాసము వ్రాయుము.

DEPARTMENT OF ZOOLOGY

ZOOLOGY PAPER FOR II SEMESTER
ZOOLOGY - PAPER - II

ANIMAL DIVERSITY – BIOLOGY OF CHORDATES

Time: 3 hrs

Max. Marks: 75

BLUE PRINT

Unit No.	Essay Questions	Short Questions	Marks allotted to the Unit	Remarks
Unit – 1	2	1	25	2 Essay Questions
Unit – 2	2	1	25	2 Essay Questions
Unit – 3	2	2	30	2 Essay Question
Unit – 4	2	2	30	2 Essay Questions
Unit – 5	2	2	30	2 Essay Questions
Total Marks including Choice				140

Note: - The Question Paper setters are requested to adhere to the format given above.

DEPARTMENT OF ZOOLOGY

ZOOLOGY PRACTICAL SYLLABUS FOR II SEMESTER ZOOLOGY - PAPER – II

ANIMAL DIVERSITY – BIOLOGY OF CHORDATES

Periods: 24

Max. Marks: 50

OBSERVATION OF THE FOLLOWING SLIDES / SPOTTERS / MODELS

1. Protochordata: *Herdmania*, *Amphioxus*, *Amphioxus* T.S. through pharynx
2. Cyclostomata: *Petromyzon*, *Myxine*
3. Pisces: *Pristis*, *Torpedo*, *Hippocampus*, *Exocoetus*, *Eheneis*, *Labeo*, *Catla*, *Clarius*, *Channa*, *Auguilla*,
4. Amphibia: *Ichthyophis*, *Amblystoma*, *Axolotl* larva, *Hyla*.
5. Reptilia: *Draco*, *Chamaeleon*, *Uromastix*, *Testudo*, *Trionix*, *Russels viper*, *Naja*, *Krait*, *Hydrophis*, *Crocodile*.
6. Aves: *Psittacula*, *Eudynamis*, *Bubo*, *Alcedo*.
7. Mammalia: *Ornithorhynchus*, *Pteropus*, *Funambulus*.

Dissections:

1. *Scoliodon* IX & X cranial nerves.
2. *Scoliodon* Brain.
3. Mounting of fish scales.

Note: 1. Dissections are to be demonstrated only by virtual.

2. Laboratory Record work shall be submitted at the time of Practical Examinations

DEPARTMENT OF ZOOLOGY

ZOOLOGY PRACTICAL MODEL PAPER FOR II SEMESTER ZOOLOGY - PAPER – II

ANIMAL DIVERSITY – BIOLOGY OF CHORDATES

TIME: 3 Hrs.

Max. Marks: 50

I. Draw a neat labeled diagram of Cranial Nerves of *Scoliodon* (IX&X) or Brain of *Scoliodon*.
10 + 5 = 15 M

II. Mounting of Scale (Labeled Diagram only) 10 M

III. Identify, Sketch and Comment on 5 x 3 = 15 M

A

B

C

D

E

IV Record + Viva 10 M

Total

50

DEPARTMENT OF ZOOLOGY

ZOOLOGY SYLLABUS FOR III SEMESTER
ZOOLOGY - PAPER – III

CYTOLOGY, GENETICS AND EVOLUTION

Periods: 60

Max. Marks: 75

UNIT - I

1. CYTOLOGY

- 1.1 Definition, history, prokaryotic and eukaryotic cells.
- 1.2 Electron microscopic structure of eukaryotic cell.
- 1.3 Plasma membrane –Fluid Mosaic model of plasma membrane.

UNIT – II

2. CELL ORGANELLES

- 2.1 Structure and functions of Endoplasmic Reticulum
- 2.2 Structure and functions of Golgi apparatus
- 2.3 Structure and functions of Lysosomes
- 2.4 Structure and functions of Ribosomes
- 2.5 Structure and functions of Mitochondria
- 2.6 Nucleus
- 2.7 Chromosomes - Structure, types, functions

UNIT - III

3.1 GENETICS – I

- 3.1.1 Mendel's work on transmission on traits
- 3.1.2 Principles of inheritance
- 3.1.3 Incomplete dominance and co-dominance
- 3.1.4 Epistasis, Pleiotropy

UNIT - IV

4.1 GENETICS – II

- 4.1.1 Sex determination
- 4.1.2 Sex linked inheritance
- 4.1.3 Extra chromosomal inheritance
- 4.1.4 Human Karyotyping

UNIT – V

5.1 EVOLUTION

- 5.1.1 Lamarckism, Darwinism, Neo – Darwinism, Hardy-Weinberg Equilibrium.
- 5.1.2 Variations, isolating mechanisms, natural selection
- 5.1.3 Types of natural selection (directional, stabilizing, disruptive)
- 5.1.4 Speciation (Allopatric and Sympatric)
- 5.1.5 Macro evolutionary principles (Example: Darwin's finches)

DEPARTMENT OF ZOOLOGY

ZOOLOGY MODEL PAPER FOR III SEMESTER
ZOOLOGY - PAPER - III

CYTOLOGY, GENETICS AND EVOLUTION

Time: 3 hrs

Max. Marks: 75

I. Answer any FIVE of the following. Draw labeled diagrams wherever necessary. 5 x 5 = 25 M

1. Fluid mosaic model – కేంద్రక పూర్వకణము
2. Nucleus – కేంద్రకము
3. Incomplete dominance – అసంపూర్ణ బహిర్గతత్వం
4. Epistasis – ఎపిస్టాసిస్
5. Sex Linkage – లింగ సహలగ్నత
6. Human Karyotyping – మానవ కారియోటైపింగ్
7. Hardy-Weinberg equilibrium – హార్డి-వీనెబర్గ్ సమతాస్థితి
8. Darwin's Finches – డార్విన్ ఫించ్ పక్షులు

II. Answer any FIVE of the following. Draw labeled diagrams wherever necessary. 5 x 10 = 50 M

9. Write an essay on electron microscopic structure of a typical animal cell.

సాధరణ జంతు కణ నిర్మాణమును గూర్చి ఒక వ్యాసము వ్రాయుము.

OR

Give an account on Fluid Mosaic model of Plasma Membrane.

ప్లాస్మా త్వచము యొక్క ద్రవ మోసాయిక్ నమూనాను గూర్చి వ్రాయుము.

10. Describe the structure and functions of Endoplasmic Reticulum.

అంతర్జీవ ద్రవ్య జాలకము యొక్క నిర్మాణము మరియు విధులను గూర్చి వర్ణింపుము.

OR

Give an account on structure and functions of Mitochondria.

మైటోఖాండ్రీయా యొక్క నిర్మాణము మరియు విధులను గూర్చి వ్రాయుము.

11. Describe the Mendel's work on transmission of traits.

లక్షణముల అనువంశికతను గూర్చి మెండల్ చేసిన ప్రయోగములను గూర్చి వర్ణింపుము.

OR

Write an essay on Principles of Inheritance.

అనువంశిక నియమములను గూర్చి ఒక వ్యాసము వ్రాయుము.

12. Give an account on Sex Determination in animals.

జంతువులలో లింగ నిర్ధారణను గూర్చి వ్రాయుము.

OR

Write an essay on Extra Chromosomal Inheritance.

క్రోమోజోమేతర ఆనువంశికతను గూర్చి ఒక వ్యాసము వ్రాయుము.

13. Describe the Evolutionary Theory of Darwin.

డార్విన్ పరిణామ సిద్ధాంతమును గూర్చి వర్ణింపుము.

OR

Give an account on different types of Speciation.

జాతులు ఏర్పడు వివిధ రకముల పద్ధతులను గూర్చి వ్రాయుము.

DEPARTMENT OF ZOOLOGY

ZOOLOGY PAPER FOR III SEMESTER
ZOOLOGY - PAPER - III

CYTOLOGY, GENETICS AND EVOLUTION

Time: 3 hrs

Max. Marks: 75

BLUE PRINT

Unit No.	Essay Questions	Short Questions	Marks allotted to the Unit	Remarks
Unit – 1	2	1	25	2 Essay Questions
Unit – 2	2	1	25	2 Essay Questions
Unit – 3	2	2	30	2 Essay Question
Unit – 4	2	2	30	2 Essay Questions
Unit – 5	2	2	30	2 Essay Questions
Total Marks including Choice				140

Note: - The Question Paper setters are requested to adhere to the format given above.

DEPARTMENT OF ZOOLOGY

ZOOLOGY PRACTICAL SYLLABUS FOR III SEMESTER ZOOLOGY - PAPER – III

CYTOLOGY, GENETICS AND EVOLUTION

Periods: 24

Max. Marks: 50

I. CYTOLOGY

1. Preparation of temporary slides of Mitotic divisions with onion root tips
2. Observation of various stages of Mitosis and Meiosis with prepared slides
3. Mounting of salivary gland chromosomes of *Chironomus*

II. GENETICS

1. Study of Mendelian inheritance using suitable examples
2. Study of linkage recombination, gene mapping using the data
3. Study of human karyotypes

III. EVOLUTION

1. Study of fossil evidences
2. Study of homology and analogy from suitable specimens and pictures
3. Phylogeny of horse with pictures
4. Darwin's finches (pictures)
5. Visit to natural history museum and submission of report

DEPARTMENT OF ZOOLOGY

ZOOLOGY PRACTICAL MODEL PAPER FOR III SEMESTER ZOOLOGY - PAPER – III

CYTOLOGY, GENETICS AND EVOLUTION

Time: 3 Hrs.

Max. Marks: 50

I. Estimate the amount of carbohydrates/Proteins/Fats in the given sample and write the procedure adopted for it (Physiology Experiment) 10 + 5 = 15 M

II, Estimate the amount of Dissolved oxygen/P^H/Alkalinity/Salinity in the given sample and write the procedure adopted for it (Ecology Experiment) 10 M

III. Identify, Sketch and Comment on 5 x 3 = 15 M

- A. T.S. of Testes or Ovary
- B. One of the Cleavage stages
- C. Chick Embryo 18 hrs./24 hrs./33 hrs./48 hrs.
- D. T. S. of Duodenum/Liver/Kidney/Lung
- E. T.S. Spinal cord/Bone/Cartilage

IV Record + Viva 10 M

Total

50 M

DEPARTMENT OF ZOOLOGY

ZOOLOGY SYLLABUS FOR IV SEMESTER ZOOLOGY - PAPER – IV

EMBRYOLOGY, PHYSIOLOGY AND ECOLOGY

Periods: 60

Max. Marks: 75

UNIT - I

1.1 DEVELOPMENTAL BIOLOGY AND EMBRYOLOGY

- 1.1.1 Gametogenesis
- 1.1.2 Fertilization
- 1.1.3 Types of eggs
- 1.1.4 Types of cleavages
- 1.2. Formation and functions of Foetal membrane in chick embryo
- 1.3. Types and functions of Placenta in mammals

UNIT - II

2.1 PHYSIOLOGY – I

- 2.1.1 Elementary study of process of digestion
- 2.1.2 Absorption of digested food
- 2.1.3 Respiration - Transport of oxygen and carbon dioxide
- 2.1.4 Circulation - Structure and functioning of heart, Cardiac cycle
- 2.1.5 Excretion - Structure of nephron, urine formation, counter current mechanism

UNIT - III

3.1 PHYSIOLOGY - II

- 3.1.1 Nerve impulse transmission - Resting membrane potential, origin and propagation of action potentials along myelinated and non-myelinated nerve fibers.
- 3.1.2 Muscle contraction - Ultra structure of muscle fibre, molecular and chemical basis of muscle contraction.
- 3.1.3 Endocrine glands - Structure, secretions and the functions (of hormones) of pituitary, thyroid, parathyroid, adrenal glands and pancreas
- 3.1.4 Hormonal control of reproduction in a mammal

UNIT - IV

4.1 ECOLOGY – I

- 4.1.1 Meaning and scope of Ecology
- 4.1.2 Important abiotic factors of Ecosystem - Temperature, light, water, oxygen and Carbon dioxide.
- 4.1.3 Nutrient cycles - Nitrogen, Carbon and phosphorus
- 4.1.4 Components of Ecosystem (lake), food chains and food web, energy flow in Ecosystem.

UNIT - V

5.1 ECOLOGY – II

5.1.1 Habitat and ecological niche

5.1.2 Community interactions - Mutualism, commensalism, parasitism, competition, predation.

5.1.3 Ecological succession

5.1.4 Population studies

6.1 ZOOGEOGRAPHY

6.1.1 Zoogeographical regions

6.1.1 Study of physical and faunal peculiarities of Oriental, Australian and Ethiopian regions.

DEPARTMENT OF ZOOLOGY

ZOOLOGY MODEL PAPER FOR IV SEMESTER
ZOOLOGY - PAPER – IV

EMBRYOLOGY, PHYSIOLOGY AND ECOLOGY

Time: 3 hrs

Max. Marks: 75

I. Answer any FIVE of the following. Draw labeled diagrams wherever necessary. 5 x 5 = 25 M

1. Spermatogenesis – శుక్ర కణోత్పత్తి
 2. Cardiac Cycle – హృదయ వలయము
 3. Nerve Impulse – నాడీ ప్రచోధనము
 4. Pancreas – క్లోమము
 5. Light – కాంతి
 6. Food Chain – ఆహారపు గొలుసు
 7. Competition – పోటీతత్వము
 8. Zoogeographical Region – జంతు భౌగోళిక ప్రాంతము
- II. Answer any FIVE of the following. Draw labeled diagrams wherever necessary. 5 x 10 = 50 M

9. Write an essay on different types of Cleavages.

వివిధ రకముల విడళనములను గూర్చి ఒక వ్యాసము వ్రాయుము.

OR

Give an account on types and functions of Placenta in Mammals.

క్షీరదాలలో జరాయువు రకములు మరియు విధులను గూర్చి వ్రాయుము.

10. Describe the process of Digestion.

జీర్ణక్రియా విధానమును గూర్చి వర్ణింపుము.

OR

Give an account on structure and functions of Nephron.

నెఫ్రాను యొక్క నిర్మాణము మరియు విధులను గూర్చి వ్రాయుము.

11. Describe the Ultra structure of muscle fibre.

కండరపు పోగు యొక్క సూక్ష్మ నిర్మాణమును గూర్చి వర్ణింపుము.

OR

Write an essay on Hormonal control of reproduction in mammals.

క్షీరదాలలో ప్రత్యుత్పత్తి యొక్క హార్మోనుల నియంత్రణను గూర్చి ఒక వ్యాసము వ్రాయుము.

12. Give an account on 'Temperature as an Ecological factor'.

'ఉష్ణోగ్రత ఒక జీవావరణ కారకము' ను గూర్చి వ్రాయుము.

OR

Write an essay on Ecosystem by taking a Lake as an example.

ఒక సరస్సును ఉదహరిస్తూ జీవావరణ వ్యవస్థను గూర్చి ఒక వ్యాసము వ్రాయుము.

13. Describe the process of Ecological Succession.

జీవావరణ అనుక్రమమును గూర్చి వర్ణింపుము.

OR

Give an account on Physical and Faunal characters of Oriental Region.

ఓరియంటల్ ప్రాంతపు భౌతిక మరియు జంతు లక్షణములను గూర్చి వ్రాయుము.

DEPARTMENT OF ZOOLOGY

ZOOLOGY PAPER FOR IV SEMESTER

ZOOLOGY - PAPER - IV

EMBRYOLOGY, PHYSIOLOGY AND ECOLOGY

Time: 3 hrs

Max. Marks: 75

BLUE PRINT

Unit No.	Essay Questions	Short Questions	Marks allotted to the	Remarks
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			Unit	
Unit – 1	2	1	25	2 Essay Questions
Unit – 2	2	1	25	2 Essay Questions
Unit – 3	2	2	30	2 Essay Question
Unit – 4	2	2	30	2 Essay Questions
Unit – 5	2	2	30	2 Essay Questions
Total Marks including Choice 140				

Note: - The Question Paper setters are requested to adhere to the format given above.

DEPARTMENT OF ZOOLOGY

ZOOLOGY PRACTICAL SYLLABUS FOR IV SEMESTER ZOOLOGY - PAPER – IV

EMBRYOLOGY, PHYSIOLOGY AND ECOLOGY

Periods: 24

Max. Marks: 50

I. EMBRYOLOGY

1. Study of T.S. of testis, ovary of a mammal
2. Study of different stages of cleavages (2, 4, 8 cell stages)
3. Study of chick embryos of 18 hours, 24 hours, 33 hours and 48 hours of incubation

II. PHYSIOLOGY

1. Qualitative tests for identification of carbohydrates, proteins and fats
2. Qualitative tests for identification of ammonia, urea and uric acid
3. Study of activity of salivary amylase under optimum conditions
4. Study of prepared slides of T.S. of duodenum, liver, lung, kidney, spinal cord, bone and cartilage

III. ECOLOGY

1. Determination of pH of given sample
2. Estimation of dissolved oxygen of given sample
3. Estimation of total alkalinity of given sample
4. Estimation of salinity of given sample

DEPARTMENT OF ZOOLOGY

ZOOLOGY PRACTICAL MODEL PAPER FOR IV SEMESTER ZOOLOGY - PAPER – IV

EMBRYOLOGY, PHYSIOLOGY AND ECOLOGY

Time: 3 Hrs.

Max. Marks: 50

- I. Estimate the amount of carbohydrates/Proteins/Fats in the given sample and write the procedure adopted for it (Physiology Experiment) 10 + 5 = 15 M

II, Estimate the amount of Dissolved oxygen/ P^H /Alkalinity/Salinity in the given sample and write the procedure adopted for it (Ecology Experiment) 10 M

III. Identify, Sketch and Comment on 5 x 3 = 15 M

- A. T.S. of Testes or Ovary
- B. One of the Cleavage stages
- C. Chick Embryo 18 hrs./24 hrs./33 hrs./48 hrs.
- D. T. S. of Duodenum/Liver/Kidney/Lung
- E.T.S. Spinal cord/Bone/Cartilage

IV Record + Viva 10 M

Total

50 M

DEPARTMENT OF ZOOLOGY

ZOOLOGY SYLLABUS FOR V SEMESTER ZOOLOGY - PAPER – V

ANIMAL BIOTECHNOLOGY

Periods: 60

Max. Marks: 75

UNIT - I

Tools of Recombinant DNA technology - Enzymes and Vectors
Restriction modification systems: Types I, II and III.
Application of Type II restriction enzymes in Genetic Engineering.
Cloning Vectors - Plasmid vectors, pBR and pUC series.

UNIT - II

Techniques of Recombinant DNA technology

Gene delivery: Microinjection, Electroporation, Biolistic method (gene gun), liposome and viral-mediated delivery

PCR: Basics of PCR.

Hybridization techniques - Southern and Northern.

Genomic and cDNA libraries - Preparation and Uses

UNIT – III

Animal Cell Technology

Cell culture media: Natural and Synthetic

Cell cultures: primary culture, secondary culture, continuous cell lines, Protocols for Primary

Cell Culture - Organ culture and Cryopreservation.

Hybridoma Technology-Cell fusion, Production of Monoclonal antibodies (mAb), Applications of mAb

Stem cells: Types of stem cells, applications

UNIT - IV

Reproductive Technologies & Transgenic Animals

Manipulation of reproduction in animals - Artificial Insemination, *In vitro* fertilization, super ovulation, Embryo transfer, Embryo Cloning

Transgenic Animals: Strategies of Gene transfer; Transgenic - sheep, - fish and applications

UNIT - V

Agriculture: fisheries – monoculture in fishes, polyploidy in fishes. DNA finger .printing.

DEPARTMENT OF ZOOLOGY

ZOOLOGY MODEL PAPER FOR V SEMESTER

ZOOLOGY - PAPER – V

ANIMAL BIOTECHNOLOGY

Time: 3 hrs

Max. Marks: 75

I. Answer any FIVE of the following. Draw labeled diagrams wherever necessary. 5 x 5 = 25 M

1. p^{BR} – p^{BR}

2. Microinjection – మైక్రో ఇంజక్షన్

3. Cell Lines – కణ వరసలు

4. Monoclonal Anti Bodies (mAb) – ఏక సంతత ప్రతి రక్షకాలు

5. Transgenesis – ట్రాన్స్ జెనిసిస్

6. Super Ovulation – అధి అండోత్పత్తి

7. Monoculture – ఏకసంవర్ధనము

8. Polyploidy – పాలి ప్లాయిడి

II. Answer any FIVE of the following. Draw labeled diagrams wherever necessary. 5 x 10 = 50 M

9. Describe various types of Restriction modification systems..

వివిధ రకముల రిస్ట్రిక్షన్ మార్పు వ్యవస్థలను గూర్చి వర్ణింపుము.

OR

Explain different types of vectors used in Biotechnology.

జీవ సాంకేతికత శాస్త్రములో వినియోగింపబడు వివిధరకాల వెక్టర్లను గూర్చి వివరింపుము.

10. Give an account on gene cloning..

జన్యు క్లోనింగ్ విధానమును గూర్చి వ్రాయుము.

OR

Write an essay on PCR Technique.

పి.సి.ఆర్. సాంకేతికతను గూర్చి ఒక వ్యాసము వ్రాయుము.

11. Explain various types of culture media used for Animal cell culture.

జంతు కణ సంవర్ధనములో వినియోగించు వివిధ రకముల మాద్యమములను గూర్చి వివరింపుము.

OR

Write an essay on methods used for organ culture.

అంగ సంవర్ధనములో వినియోగించు వివిధ పద్ధతులను గూర్చి ఒక వ్యాసము వ్రాయుము.

12. Describe Artificial Insemination followed in animals.

జంతువులలో అవలంబించు కృత్రిమ గర్భధారణను గూర్చి వర్ణింపుము.

OR

Write an essay on Transgenic Animals.

ట్రాన్స్ జెనిక్ జంతువులను గూర్చి ఒక వ్యాసము వ్రాయుము.

13. Describe the Monoculture in fishes.

చేపలలో ఏకసంవర్ధనమును గూర్చి వర్ణింపుము.

OR

Give an account on DNA fingerprinting Technology.

డి. యన్. ఏ. ఫింగర్ ప్రింటింగ్ సాంకేతికతను గూర్చి వ్రాయుము.

DEPARTMENT OF ZOOLOGY

ZOOLOGY PAPER FOR V SEMESTER

ZOOLOGY - PAPER - V

ANIMAL BIOTECHNOLOGY

Time: 3 hrs

Max. Marks: 75

BLUE PRINT

Unit No.	Essay Questions	Short Questions	Marks allotted to the Unit	Remarks
Unit – 1	2	1	25	2 Essay Questions
Unit – 2	2	1	25	2 Essay Questions

Unit – 3	2	2	30	2 Essay Question
Unit – 4	2	2	30	2 Essay Questions
Unit – 5	2	2	30	2 Essay Questions
Total Marks including Choice 140				

Note: - The Question Paper setters are requested to adhere to the format given above.

DEPARTMENT OF ZOOLOGY

ZOOLOGY PRACTICAL SYLLABUS FOR V SEMESTER ZOOLOGY - PAPER – V

ANIMAL BIOTECHNOLOGY

Periods: 24

Max. Marks: 50

ANY SIX OF THE FOLLOWING:

1. Maintenance and storage of *E.coli* DH5 alpha cells.
2. Isolation of Plasmid DNA from *E.coli*
3. Preparation of genomic DNA from *E. coli*/animals/ human.
4. DNA quantification using Agarose gel electrophoresis (by using lambda DNA as standard).
5. Restriction digestion of lambda (λ) DNA using EcoR1 and Hind III.
6. Preparation for insertion and vector for ligation.

7. Performance of ligation reaction using T4 DNA Ligase.
8. Preparation of competent cells
9. Transformation of *E. coli* with plasmid DNA using CaCl₂,
10. Selection of transformants on X-gal and IPTG
11. Techniques: Western Blot, Southern Hybridization, DNA Fingerprinting
12. Interpretation of sequencing gel electropherograms
13. Amplification of DNA by PCR
14. Packing and sterilization of glass and plastic wares for cell culture.
15. Preparation of culture media.

DEPARTMENT OF ZOOLOGY

ZOOLOGY PRACTICAL MODEL PAPER FOR V SEMESTER ZOOLOGY –PAPER - V

ANIMAL BIOTECHNOLOGY

Time: 3 Hrs.

Max. Marks: 50

- | | |
|--|------|
| Q. 1. Write the procedure for DNA quantification using Agarose gel electrophoresis | 15 M |
| Q. 2. Write the procedure for Preparation of culture media | 10 M |
| Q. 3. Write the procedure for the following Techniques. | 15 M |

Western Blot / Southern Hybridization / DNA Fingerprinting

Q. 4. Record and Viva Voce

10 M

Total

50 M

DEPARTMENT OF ZOOLOGY

ZOOLOGY SYLLABUS FOR V SEMESTER
ZOOLOGY - PAPER – VI

ANIMAL HUSBANDRY

Periods: 60

Max. Marks: 75

UNIT – I

General introduction to Principles of poultry housing.

Poultry houses.

Management of chicks, growers and layers.

Management of Broilers. poultry farming.

UNIT – II

Poultry feed management – Principles of feeding.

Nutrient requirements for different stages of layers and broilers. Methods of feeding.

Poultry diseases – viral, bacterial, fungal and parasitic (two each) symptoms, control and management.

UNIT – III

Selection, care and handling of hatching eggs. Egg testing.

Methods of hatching. Brooding and rearing.

Sexing of chicks.

UNIT- IV

Breeds of Dairy Cattle and Buffaloes – Definition of breed, Classification of Indian Cattle breeds, Exotic breeds and Indian buffalo breeds.

Systems of inbreeding and crossbreeding.

Housing of dairy animals – Selection of site for dairy farm systems of housing.

Conventional dairy barn. Cleaning and sanitation of dairy farm.

Weaning of calf. Deworming and Vaccination programme.

Records to be maintained in a dairy farm.

UNIT - V

Care and management of dairy animals.

Care and management of calf, heifer, milk animal, dry and pregnant animal, bulls and bullocks.

DEPARTMENT OF ZOOLOGY

ZOOLOGY MODEL PAPER FOR V SEMESTER

ZOOLOGY - PAPER - VI

ANIMAL HUSBANDRY

Time: 3 hrs

Max. Marks: 75

I. Answer any FIVE of the following. Draw labeled diagrams wherever necessary. 5 x 5 = 25 M

1. Poultry Houses – పౌల్ట్రీ షామ్
2. Broilers – మాంసమును ఉత్పత్తి చేయు కోళ్ళు
3. Egg Testing – గుడ్ల పరీక్ష
4. Sexing of Chicks – కోళ్ళ లింగత్వము
5. Exotic Breeds – విదేశీ జాతులు

6. Weaning of Calf – దూడల వీనింగ్
7. Dairy Animals - పాలను ఉత్పత్తి చేయు జంతువులు
8. Bulls – ఎద్దులు

II. Answer any FIVE of the following. Draw labeled diagrams wherever necessary. 5 x 10 = 50 M

9. Describe the basic principles of Poultry Housing.

పౌల్ట్రీఫామ్ యొక్క మూల నియమములను గూర్చి వర్ణింపుము.

OR

Explain the management of Growers and Layers.

గ్రోయర్స్ మరియు లేయర్స్ యొక్క యాజమాన్యంను గూర్చి వివరింపుము.

10. Give an account on principles of Poultry Feeding/

పౌల్ట్రీ జీవుల పోషణ నియమములను గూర్చి వ్రాయుము.

OR

Write an essay on Bacterial and Fungal diseases occurs in Poultry Birds.

పౌల్ట్రీ జీవులకు సంభవించు బాక్టీరియల్ మరియు ఫంగల్ వ్యాధులను గూర్చి ఒక వ్యాసము వ్రాయుము.

11. Explain about selection and caring of hatching Eggs.

పొడుగు గుడ్ల ఎంపిక మరియు జాగ్రత్తలను గూర్చి వివరింపుము.

OR

Write an essay on different methods of hatching eggs.

గుడ్లను పొదిగించుటకు అవలంబించు వివిధ పద్ధతులను గూర్చి ఒక వ్యాసము వ్రాయుము.

12. Describe the systems of Inbreeding and crossbreeding.

అంతప్రజననము మరియు పరాగప్రజనన వ్యవస్థలను గూర్చి వర్ణింపుము.

OR

Write an essay on maintenance of Records in Dairy Farm.

డైరీ పామ్ నందు నిర్వహించవలసిన రికార్డులను గూర్చి ఒక వ్యాసము
వ్రాయుము.

13. Describe the Care and Management of Dairy Animals.

డైరీ పశువుల జాగ్రత్తలు మరియు యాజమాన్యంను గూర్చి వర్ణింపుము.

OR

Give an account on Care and Management of Dry and Pregnant Animals.
వట్టిపోయిన మరియు సూడి పశువుల జాగ్రత్తలు మరియు యాజమాన్యంను గూర్చి
వ్రాయుము.

DEPARTMENT OF ZOOLOGY

ZOOLOGY PAPER FOR V SEMESTER
ZOOLOGY - PAPER - VI

ANIMAL HUSBANDRY

Time: 3 hrs

Max. Marks: 75

BLUE PRINT

Unit No.	Essay Questions	Short Questions	Marks allotted to the Unit	Remarks
Unit – 1	2	1	25	2 Essay Questions
Unit – 2	2	1	25	2 Essay Questions
Unit – 3	2	2	30	2 Essay Question

Unit – 4	2	2	30	2 Essay Questions
Unit – 5	2	2	30	2 Essay Questions
Total Marks including Choice 140				

Note: - The Question Paper setters are requested to adhere to the format given above.

DEPARTMENT OF ZOOLOGY

ZOOLOGY PRACTICAL SYLLABUS FOR V SEMESTER ZOOLOGY - PAPER – VI

ANIMAL HUSBANDRY

Periods: 24

Max. Marks: 50

1. Study of various breeds of layers and broilers (photographs)
2. Identification of disease causing organisms in poultry birds (as per theory)
3. Study of the anatomy of a poultry bird by way of dissecting a bird. (Demonstration)
4. Study of various activities in a poultry farm (layers and broilers) and submission of a report.
5. Study of various breeds of cattle (photographs/microfilms)
6. Study of various activities carried out in a dairy farm and submission of a report.

DEPARTMENT OF ZOOLOGY

ZOOLOGY PRACTICAL MODEL PAPER FOR V SEMESTER ZOOLOGY – PAPER - VI

ANIMAL HUSBANDARY

Time: 3 Hrs.

Max. Marks: 50

- Q. 1. Identification of various breeds of Layers/Broilers/Cattle 2 x 10 = 20 M
- A.
- B.
- Q. 2. Draw a neat labeled diagram of digestive system of Bird 10 M
- Q. 3. Identification of diseases occurs in Poultry Birds 2 x 5 = 10 M

A.

B.

Q. 4. Record and Field visit Report

10 M

Total

50 M

DEPARTMENT OF ZOOLOGY

ZOOLOGY SYLLABUS FOR VI SEMESTER ZOOLOGY – ELECTIVE PAPER - VII

IMMUNOLOGY

Periods: 60

Max. Marks: 75

UNIT – I

1. OVERVIEW OF IMMUNE SYSTEM

- 1.1 Introduction to basic concepts in Immunology
- 1.2 Innate and adaptive immunity
- 1.3 Cells and organs of Immune system
- 1.4 Cells of immune system
- 1.5 Organs of immune system

UNIT – II

2. ANTIGENS

- 2.1 Basic properties of antigens
- 2.2 B and T cell epitopes, haptens and adjuvants
- 2.3 Factors influencing immunogenicity

UNIT – III

3. ANTIBODIES

- 3.1 Structure of antibody
- 3.2 Classes and functions of antibodies
- 3.3 Monoclonal antibodies

UNIT – IV

4. WORKING OF IMMUNE SYSTEM

- 4.1 Structure and functions of major histocompatibility complexes
- 4.2 Exogenous and Endogenous pathways of antigen presentation and processing
- 4.3 Basic properties and functions of cytokines

UNIT – V

5. IMMUNE SYSTEM IN HEALTH AND DISEASE

- 5.1 Classification and brief description of various types of hyper sensitivities
- 5.2 Introduction to concepts of autoimmunity and immunodeficiency

VACCINES

- 5.3 General introduction to vaccines
- 5.4 Types of vaccines

DEPARTMENT OF ZOOLOGY

ZOOLOGY MODEL PAPER FOR VI SEMESTER ZOOLOGY - ELECTIVE PAPER – VII

IMMUNOLOGY

Time: 3 hrs

Max. Marks: 75

I. Answer any FIVE of the following. Draw labeled diagrams wherever necessary. 5 x 5 = 25 M

1. Concepts of Immunology – రోగనిరోధకశాస్త్రము యొక్క భావన
2. Haptanes – హేప్టేనులు
3. Antibody – ప్రతిరక్షకము
4. Monoclonal Antibodies – ఏకసంతత ప్రతిరక్షకాలు
5. Exogenous – ఎక్సో జీనులు
6. Cytokines – సైటోకైన్స్
7. Hypersensitivity – అధిసున్నితత్వము
8. Vaccines – టీకాలు

II. Answer any FIVE of the following. Draw labeled diagrams wherever necessary. 5 x 10 = 50 M

9. Describe the different types of Immunity.

వివిధ రకముల రోగనిరోధకతలను గూర్చి వర్ణింపుము.

OR

Explain the Cells of Immune System.

రోగనిరోధక వ్యవస్థ యొక్క కణములను గూర్చి వివరింపుము.

10. Give an account on basic properties of Antigens.

ప్రతిజనకాల మూల ధర్మములను గూర్చి వ్రాయుము.

OR

Write an essay on factors influencing Immunogenicity.

ఇమ్మ్యూనోజెనిసిటీను ప్రభావితం చేయు కారకాలను గూర్చి ఒక వ్యాసమ వ్రాయుము.

11. Explain about the structure of Antibody.

ప్రతిరక్షకము యొక్క నిర్మాణమును గూర్చి వివరింపుము.

OR

Write an essay on classes and functions of Antibodies.

ప్రతిరక్షకాల వర్గములు మరియు విధులను గూర్చి ఒక వ్యాసము వ్రాయుము.

12. Describe the structure and functions of major histocompatibility complexes.

మేజర్ హిస్టోకాంపేటబిలిటీసంక్లిష్టం యొక్క నిర్మాణము మరియు విధులను గూర్చి వర్ణింపుము.

OR

Write an essay on basic properties and functions of Cytokines.

సైటోకైన్స్ మూల ధర్మములను మరియు విధులను గూర్చి ఒక వ్యాసము వ్రాయుము.

13. Describe the classification of various types of Hypersensitivities.

వివిధ రకముల అధిసున్నితత్వముల వర్గీకరణను గూర్చి వర్ణింపుము.

OR

Give an account on various types of Vaccines.

వివిధ రకముల టీకాలను గూర్చి వ్రాయుము.

DEPARTMENT OF ZOOLOGY

ZOOLOGY PAPER FOR VI SEMESTER
ZOOLOGY - PAPER - VII

IMMUNOLOGY

Time: 3 hrs

Max. Marks: 75

BLUE PRINT

Unit No.	Essay Questions	Short Questions	Marks allotted to the Unit	Remarks
Unit – 1	2	1	25	2 Essay Questions
Unit – 2	2	1	25	2 Essay Questions
Unit – 3	2	2	30	2 Essay Question

Unit – 4	2	2	30	2 Essay Questions
Unit – 5	2	2	30	2 Essay Questions
Total Marks including Choice				140

Note: - The Question Paper setters are requested to adhere to the format given above.

DEPARTMENT OF ZOOLOGY

ZOOLOGY PRACTICAL SYLLABUS FOR VI SEMESTER ZOOLOGY –ELECTIVE PAPER - VII

IMMUNOLOGY

Periods: 24

Max. Marks: 50

1. Demonstration of lymphoid organs (as per UGC guidelines)
2. Histological study of spleen, thymus and lymph nodes (through prepared slides)
3. Blood group determination
4. Demonstration of
 - a. ELISA
 - b. Immunoelectrophoresis

DEPARTMENT OF ZOOLOGY

ZOOLOGY PRACTICAL MODEL PAPER FOR VI SEMESTER ZOOLOGY – ELECTIVE PAPER - VII

IMMUNOLOGY

Time: 3 Hrs.

Max. Marks: 50

- Q. 1. Identify the blood group in the given sample of blood and write the procedure adopted for it. 10 + 5 = 15 M
- Q. 2. Write the procedure for ELISA test 10 M
- Q. 3. Identify, Sketch and comment on 2 x 5 = 10 M
- A.
- B.
- Q. 4. Record and Viva Voce 10 M

Q. 5. Project Work Report

5 M

Total

50 M

DEPARTMENT OF ZOOLOGY

ZOOLOGY SYLLABUS FOR VI SEMESTER ZOOLOGY – CLUSTER ELECTIVE PAPER: VIII - (A)

PRINCIPLES OF AQUACULTURE

Periods: 60

Max. Marks: 75

UNIT – I

1.1 INTRODUCTION / BASICS OF AQUACULTURE

- 1.1.1 Definition, Significance and History of Aquaculture
- 1.1.2 Present status of Aquaculture – Global and National scenario
- 1.1.3 Major cultivable species for aquaculture: freshwater, brackish water and marine.
- 1.1.4 Criteria for the selection of species for culture

UNIT – II

2.1 TYPES OF AQUACULTURE

- 2.1.1 Concept of Monoculture, Poly culture, Composite culture, Mono sex culture and Integrated fish farming
- 2.2 Ponds, Raceways, Cages, Pens, Rafts and water re-circulating systems
- 2.3 Traditional, extensive, modified extensive, semi-intensive and intensive cultures of fish and shrimp.

UNIT – III

3.1 DESIGN AND CONSTRUCTION OF AQUA FARMS

3.1.1 Criteria for the selection of site for freshwater and brackish water pond farms

3.1.2 Design and construction of fish and shrimp farms

3.2 Seed resources

3.2.1 Natural seed resources and Procurement of seed for stocking: Carp and shrimp

3.3 Nutrition and feeds

3.3.1 Nutritional requirements of a cultivable fish and shellfish

3.3.2 Natural food and Artificial feeds and their importance in fish and shrimp culture

UNIT – IV

4.1 MANAGEMENT OF CARP CULTURE PONDS

4.1.1 Culture of Indian major carps: Pre-stocking management – Dewatering, drying, ploughing / de silting Predators, weeds and algal blooms and their control, Liming and fertilization, Stocking management – Stocking density and stocking; Post-stocking management – Feeding, water quality, growth and health care and Harvesting of ponds.

4.2 Culture of giant freshwater prawn, *Macro brachium rosenbergii*

UNIT – V

5.1 Culture of shrimp (*Penaeus monodon* or *Litopenaeus vannamei*)

5.2 Culture of pearl oysters

5.3 Culture of seaweeds-species cultured, culture techniques, important by-products, prospects

5.4 Culture of ornamental fishes – Setting up and maintenance of aquarium; and breeding.

DEPARTMENT OF ZOOLOGY

ZOOLOGY MODEL PAPER FOR VI SEMESTER ZOOLOGY - ELECTIVE PAPER – VII

PRINCIPLES OF AQUACULTURE

Time: 3 hrs

Max. Marks: 75

I. Answer any FIVE of the following. Draw labeled diagrams wherever necessary. 5 x 5 = 25 M

1. Catla catla – కట్లా కట్లా
2. Poly culture – బహుళ సంవర్ధనము
3. Seed resources – విత్తన వనరులు
4. Natural Food – సహజ ఆహారము
5. Predators – పరభక్షులు
6. Water Quality – నీటి నాణ్యత
7. Pearl Oyster – ముత్యపు చిప్ప
8. Ornamental Fishes – అలంకరణ చేపలు

II. Answer any FIVE of the following. Draw labeled diagrams wherever necessary. 5 x 10 = 50 M

9. Describe the Significance of Aquaculture.

నీటి సంవర్ధనము యొక్క ప్రాముఖ్యతను గూర్చి వర్ణింపుము.

OR

Write an essay on major cultivable species of fresh water.
మంచి నీటి ముఖ్య పెంపకపు చేపలను గూర్చి ఒక వ్యాసము వ్రాయుము.

10. Give an account on Integrated Fish Farming.

సమగ్ర చేపల పెంపకమును గూర్చి వ్రాయుము.

OR

Write an essay on semi-intensive and intensive cultures of shrimp.
రొయ్య సెమి-ఇంటెన్సివ్ మరియు ఇంటెన్సివ్ సంవర్ధనమును గూర్చి ఒక వ్యాసము వ్రాయుము.

11. Explain about the Design and Construction of a fish pond.

చేపల కుంట నమూనా మరియు నిర్మాణమును గూర్చి వివరింపుము.

OR

Write an essay on Nutritional requirements of a cultivable fish.
పెంపకపు చేపల పోషణా అవసరములను గూర్చి ఒక వ్యాసము వ్రాయుము.

12. Describe the Weeds and their control in a culture pond.

సంవర్ధనపు కుంటలో కలుపు మొక్కలు మరియు వాటి నివారణను గూర్చి వర్ణింపుము.

OR

Write an essay on culture of giant fresh water prawn.
మంచి నీటి అతి పెద్ద రొయ్య సంవర్ధనమును గూర్చి ఒక వ్యాసము వ్రాయుము.

13. Describe the culture of *Penaeus monodon*.

పినయస్ మోనోడాన్ సంవర్ధనమును గూర్చి వర్ణింపుము.

OR

Give an account on setting up and maintenance of an aquarium.
గాజు తొట్టె నిర్మాణము మరియు యాజమాన్యంను గూర్చి వ్రాయుము.

DEPARTMENT OF ZOOLOGY
VI SEMESTER
ZOOLOGY – CLUSTER ELECTIVE PAPER: VIII - (A)
PRINCIPLES OF AQUACULTURE

Time: 3 hrs

Max. Marks: 75

BLUE PRINT

Unit No.	Essay Questions	Short Questions	Marks allotted to the Unit	Remarks
Unit – 1	2	1	25	2 Essay Questions
Unit – 2	2	1	25	2 Essay Questions
Unit – 3	2	2	30	2 Essay Question
Unit – 4	2	2	30	2 Essay Questions
Unit – 5	2	2	30	2 Essay Questions
Total Marks including Choice				140

Note: - The Question Paper setters are requested to adhere to the format given above.

DEPARTMENT OF ZOOLOGY
ZOOLOGY SYLLABUS FOR VI SEMESTER
ZOOLOGY – CLUSTER ELECTIVE PAPER: VIII - (A)

AQUACULTURE MANAGEMENT

Periods: 60

Max. Marks: 75

UNIT – I

BREEDING AND HATCHERY MANAGEMENT:

- 1.1 Bundh Breeding and Induced breeding of carp by Hypophysation and use of synthetic hormones
- 1.2 Types of fish hatcheries; Hatchery management of Indian major carps
- 1.3 Breeding and Hatchery management of *Penaeus monodon*/ *Litopenaeus vannamei*
- 1.4 Breeding and Hatchery management of giant freshwater prawn.

UNIT – II

WATER QUALITY MANAGEMENT:

2.1 Water quality and soil characteristics suitable for fish and shrimp culture

- 2.2 Identification of oxygen depletion problems and control mechanisms in culture ponds
- 2.3 Aeration: Principles of aeration and Emergency aeration
- 2.4 Liming materials, Organic manures and Inorganic fertilizers commonly used and their implications in fish ponds

UNIT – III

FEED MANAGEMENT:

3.1 Live Foods and their role in shrimp larval nutrition.

- 3.2 Supplementary feeds, Principal foods in artificial diets, Types of feeds, feed additives and Preservatives, role of probiotics.
- 3.3 Feed formulation and manufacturing, Feed storage, feeding strategies. Feeding devices, feeding schedules and ration size, Feed Evaluation - feed conversion efficiencies and ratios

UNIT – IV

DISEASE MANAGEMENT:

- 4.1 Principles of disease diagnosis and health management
- 4.2 Prophylaxis, Hygiene and Therapy of fish diseases
- 4.3 Specific and non-specific defense systems in fish, Fish immunization and vaccination
- 4.4 Etiology, Symptoms, prophylaxis and therapy of common fish diseases in fish ponds and common shrimp diseases in shrimp ponds

UNIT – V

ECONOMICS AND MARKETING:

- 5.1 Principles of aquaculture economics – Capital costs, variable costs, cost-benefit analysis
- 5.2 Fish marketing methods in India. Basic concepts in demand and price analysis.
Fisheries Extension
- 5.3 Fisheries training and education in India. Role of extension in community development.
- 5.4 Genetic improvement of fish stocks – Hybridization of fish.
- 5.5 Gynogenesis, Androgenesis, Polyploidy, Transgenic fish, Cryopreservation of gametes, Production of monosex and sterile fishes and their significance in aquaculture.

DEPARTMENT OF ZOOLOGY

ZOOLOGY MODEL PAPER FOR VI SEMESTER ZOOLOGY - ELECTIVE PAPER – VII

AQUACULTURE MANAGEMENT

Time: 3 hrs

Max. Marks: 75

I. Answer any FIVE of the following. Draw labeled diagrams wherever necessary. 5 x 5 = 25 M

1. Bundh Breeding – బండ్ ప్రజననం
2. Liming – సున్నం చల్లుట
3. Live Foods – జీవ ఆహారములు
4. Probiotics – సూక్ష్మ జీవకాలు
5. Prophylaxis – రోగనిరోధనము
6. Vaccination – టీకాలు వేయుట
7. Fish marketing – చేపల విపణి
8. Transgenic Fish – ట్రాన్స్ జెనిక్ చేప

II. Answer any FIVE of the following. Draw labeled diagrams wherever necessary. 5 x 10 = 50 M

9. Write an essay on Induced Breeding technique in fishes.

చేపలలో ప్రేరేపిత ప్రజనన సాంకేతిక విధానమును గూర్చి ఒక వ్యాసము వ్రాయుము.

OR

Describe the Breeding and Hatchery Management of *Penaeus monodon*.
పినయస్ మోనోడాన్ ప్రజననం మరియు హేచరి యాజమాన్యంను గూర్చి
వర్ణింపుము.

10. Give an account on Water Quality Management for Shrimp culture.
ప్రింప్ సంవర్ధనములో నీటి నాణ్యతా యాజమాన్యమును గూర్చి వ్రాయుము.

OR

Write an essay on principles of aeration and emergency aeration.
ఏరేషన్ నియమములు మరియు అత్యవసర ఏరేషన్ లను గూర్చి ఒక వ్యాసము
వ్రాయుము.

11. Explain about the supplementary feeds used in culture ponds.
చేపల కుంటలలో వినియోగించు అనుభంధ ఆహారములను గూర్చి
వివరింపుము.

OR

Give an account on Feed Formulation and Feed manufacturing.
మేతల సంఘటనలు మరియు మేతల తయారీ విధానములను గూర్చి
వ్రాయుము.

12. Describe the principles of Disease Diagnosis and Health Management.
వ్యాధుల నిర్ధారణ నియమములు మరియు ఆరోగ్య యాజమాన్యములను గూర్చి
వర్ణింపుము.

OR

Write an essay on specific and non-specific defense systems of fish.
నిర్దిష్ట మరియు నిర్దిష్టము కాని నిరోధక వ్యవస్థలను గూర్చి ఒక వ్యాసము
వ్రాయుము.

13. Describe the principles of Aquaculture economics.
నీటిసంవర్ధనము యొక్క ఆర్థికతా నియమములను గూర్చి వర్ణింపుము.

OR

Write an essay on Genetic improvement of fish stocks.
చేపల సమూహముల యొక్క జన్యు అభివృద్ధిని గూర్చి ఒక వ్యాసము వ్రాయుము.

DEPARTMENT OF ZOOLOGY
VI SEMESTER
ZOOLOGY – CLUSTER ELECTIVE PAPER: VIII - (A)
AQUACULTURE MANAGEMENT

Time: 3 hrs

Max. Marks: 75

BLUE PRINT

Unit No.	Essay Questions	Short Questions	Marks allotted to the Unit	Remarks
Unit – 1	2	1	25	2 Essay Questions
Unit – 2	2	1	25	2 Essay Questions
Unit – 3	2	2	30	2 Essay Question

Unit – 4	2	2	30	2 Essay Questions
Unit – 5	2	2	30	2 Essay Questions
Total Marks including Choice				140

Note: - The Question Paper setters are requested to adhere to the format given above.

DEPARTMENT OF ZOOLOGY

ZOOLOGY PRACTICAL SYLLABUS FOR VI SEMESTER ZOOLOGY – CLUSTER ELECTIVE PAPER: VIII - (A)

AQUACULTURE MANAGEMENT

Periods: 24

Max. Marks: 50

Nutrition

1. Identification and study of live food organisms – Any five
2. Formulation and preparation of a balanced fish feed
3. Estimation of Proximate composition of aquaculture feeds – Proteins, carbohydrates, lipids, moisture, ash content.
1. Gut content analysis to study artificial and natural food intake.

Post harvest Technology

1. Evaluation of fish/ fishery products for organoleptic, chemical and microbial quality.
2. Preparation of dried, cured and fermented fish products, examination of salt, protein, moisture in dried / cured products, examination of spoilage of dried / cured fish products, marinades, pickles, sauce.
3. Preparation of isinglass, collagen and chitosan from shrimp and crab shell.
4. Developing flow charts and exercises in identification of hazards – preparation of hazard analysis worksheet, plan form and corrective action procedures in processing

of fish.

DEPARTMENT OF ZOOLOGY

ZOOLOGY SYLLABUS FOR VI SEMESTER ZOOLOGY – CLUSTER ELECTIVE PAPER: VIII - (A)

POST HARVEST TECHNOLOGY

Time: 3 Hrs.

Max. Marks: 75

UNIT – I

HANDLING AND PRINCIPLES OF FISH PRESERVATION:

- 1.1 Handling of fresh fish, storage and transport of fresh fish, post mortem changes (rigor mortis and spoilage), spoilage in marine fish and freshwater fish.
- 1.2 Principles of preservation– cleaning, lowering of temperature, rising of temperature, denudation, use of salt, use of fish preservatives, exposure to low radiation of gamma rays.

UNIT – II

2. Methods of fish Preservation:

- 2.1 Traditional methods - sun drying, salt curing, pickling and smoking.
- 2.2 Advanced methods – chilling or icing, refrigerated sea water, freezing, canning, Irradiation and Accelerated Freeze drying (AFD).

UNIT – III

PROCESSING AND PRESERVATION OF FISH AND FISH BY-PRODUCTS:

- 3.1 Fish products – fish minced meat, fish meal, fish oil, fish liquid (ensilage), fish protein concentrate, fish chowder, fish cake, fish sauce, fish salads, fish powder, pet food from trash fish, fish manure.
- 3.2 Fish by-products – fish glue, isinglass, chitosan, pearl essence, shark fins, fish leather and fish maws.
- 3.3 Seaweed Products: Preparation of agar, algin and carrageen. Use of seaweeds as food for human consumption, in disease treatment and preparation of therapeutic drugs.

UNIT – IV

SANITATION AND QUALITY CONTROL:

- 4.1 Sanitation in processing plants - Environmental hygiene and Personal hygiene in processing plants.
- 4.2 Quality Control of fish and fishery products – pre-processing control, control during processing and control after processing.

UNIT – V

QUALITY ASSURANCE, MANAGEMENT AND CERTIFICATION:

- 5.1 Seafood Quality Assurance and Systems: Good Manufacturing Practices (GMPs); Good Laboratory Practices (GLPs); Standard Operating Procedures (SOPs); Concept of Hazard Analysis and Critical Control Points (HACCP) in seafood safety.
- 5.2 National and International standards – ISO 9000: 2000 Series of Quality Assurance System, *Codex Alimentarius*.

DEPARTMENT OF ZOOLOGY

ZOOLOGY MODEL PAPER FOR VI SEMESTER ZOOLOGY - ELECTIVE PAPER – VII

POST HARVEST TECHNOLOGY

Time: 3 hrs

Max. Marks: 75

I. Answer any FIVE of the following. Draw labeled diagrams wherever necessary. 5 x 5 = 25 M

1. Transport of fresh Fish – తాజా చేపల రవాణా
2. Smoking – పొగచూరించుట
3. Canning – కానింగ్
4. Fish Oils – చేప నూనెలు
5. Carrageen – కర్రాజీన్
6. Personal Hygiene in Processing Plants – చేపల స్థావరాలలో వ్యక్తిగత శుభ్రత
7. Good Manufacturing Practices (GMPs) – మంచి తయారీ అలవాట్లు
8. *Codex Alimentarius* – కోడెక్స్ ఎలిమెంట్వారిస్

II. Answer any FIVE of the following. Draw labeled diagrams wherever necessary. 5 x 10 = 50 M

9. Write an essay on different ways through which fish get spoiled.

చేపలు పాడగుటకు గల వివిధ పద్ధతులను గూర్చి ఒక వ్యాసము వ్రాయుము.

OR

Describe various principles followed for preservation of fish.

చేపలను నిల్వ చేయుటకు పాటించవలసిన నియమములను గూర్చి వర్ణింపుము.

10. Give an account on Traditional methods of Fish Preservation.

చేపలను నిల్వచేసే సాంప్రదాయక పద్ధతులను గూర్చి వ్రాయుము.

OR

Write an essay on Advanced methods of Fish Preservation.

చేపలను నిల్వచేసే ఆధునిక పద్ధతులను గూర్చి ఒక వ్యాసము వ్రాయుము.

11. Explain about various products obtained from fish.

చేపల నుండి లభ్యమయ్యే వివిధరకాల ఉత్పత్తులను గూర్చి వివరింపుము.

OR

Give an account on use of Sea Weeds as food for human consumption.

మానవ ఆహారంగా వినియోగింపబడు సముద్రపు కలుపు మొక్కలను గూర్చి వ్రాయుము.

12. Describe the Environmental Hygiene followed in Processing Plants.

చేపల స్థావరాలలో పాటించవలసిన పరిసరాల శుభ్రతను గూర్చి వర్ణింపుము.

OR

Explain about Quality Control followed during processing.

ప్రాసెసింగ్ సమయము నందు పాటించవలసిన నాణ్యతా నియంత్రణను గూర్చి వివరింపుము.

13. Write an essay on HACCP in Sea Food Safety.

సముద్రపు ఆహారపు పరిరక్షణలో ప్రమాద గుర్తింపు మరియు క్లిష్ట నియంత్రణా స్థానములను గూర్చి ఒక వ్యాసము వ్రాయుము.

OR

Describe the National and International Standards of Quality Assurance Systems.

నాణ్యతా హామీ వ్యవస్థలలో జాతీయ మరియు అంతర్జాతీయ ప్రమాణములను గూర్చి వర్ణింపుము.

DEPARTMENT OF ZOOLOGY

VI SEMESTER ZOOLOGY – CLUSTER ELECTIVE PAPER: VIII - (A)

POST HARVEST TECHNOLOGY

Time: 3 hrs

Max. Marks: 75

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Unit No.	Essay Questions	Short Questions	Marks allotted to the Unit	Remarks
Unit – 1	2	1	25	2 Essay Questions
Unit – 2	2	1	25	2 Essay Questions
Unit – 3	2	2	30	2 Essay Question
Unit – 4	2	2	30	2 Essay Questions

Unit – 5	2	2	30	2 Essay Questions
Total Marks including Choice				140

Note: - The Question Paper setters are requested to adhere to the format given above.

DEPARTMENT OF ZOOLOGY

ZOOLOGY PRACTICAL SYLLABUS FOR VI SEMESTER ZOOLOGY – CLUSTER ELECTIVE PAPER: VIII - (A)

POST HARVEST TECHNOLOGY

Periods: 24

Max. Marks: 50

Project Work

Visit to a fish breeding centre / fish farms and submit a project report

or

Visit to a feed manufacturing unit and submit a project report

or

Visit to a shrimp hatchery / shrimp farms and submit a project report

or

Visit to a shrimp processing unit and submit a project report

