



PVKN Govt. College(A), Chittoor

I B.Sc., SEMESTER – I: ZOOLOGY PAPER – I

TITLE OF THE PAPER: ANIMAL DIVERSITY OF INVERTEBRATES

Subject Code: 19-ZOO-101

Credits: 04

Teaching Hrs/Week:04

SYLLABUS

UNIT – I

1.0 Brief History, Significance of Diversity Of Invertebrates.1.1 Phylum Protozoa:- General Characters and Outline Classification up to Classes with Examples; Type Study: Elphidium,1.3 Phylum Porifera:- General Characters and Outline Classification Up to Classes with Examples; Canal System in Sponges.

UNIT – II

2.0 Phylum Coelenterate: - General Characters and outline Classification upto Classes with Examples; Type Study: Aurelia,Polymorphism in Coelenterates: Corals and Coral Reef Formation. 2.1 Phylum Platyhelminthes:- General Characters and Outline Classification Upto Classes With Examples; Type Study: Fasciola hepatica. 2.2 Phylum Nemat helminthes:- General Characters and OutlineClassification upto Classes with Examples. *Epidemiological incidents in Chittoor District due to the effect of Nemat helminthes.

UNIT – III

3.0 Phylum Annelida: - General Characters and Outline Classification upto Classes with Examples; Metamerism in Annelida, *,* Regeneration in annelida 3.1 Vermiculture : Scope and details of earth worm species used in Vermiculture, Processing and Significance of Vermiculture, vermi compost, Economic Importance of Vermicompost

UNIT – IV

4.0 Phylum Arthropoda:- General Characters and Outline Classification Upto Classes with Examples; Onychophora:- Peripatus-Structure & Affinities, 4.1*Practices adopted in Sericulture industry at Chittoor district,.* Vector borne diseases - Use of Swacch Bharath programme in their prevention 4.2 Phylum Mollusca:- General Characters and Outline Classification Upto Classes With Examples Pearl Formation in Pelecypoda. Torsion in Gastropoda.

UNIT – V

5.0 Phylum Echinodermata: General Characters and Outline Classification upto Classes with Examples; Water Vascular System of Star Fish. *Autotomy and

regeneration in Echinodermata 5.1 Invertebrates Larval Forms: Amphiblastula, Ephyra, Trochophora, Nauplius, Zoea, Glochidium, Bipinnaria. 5.2 Hemichordata: General Characters and Outline Classification Upto Classes with Examples; Balanoglossus: Structure, Affinities & Tornaria Larvae



PVKN Govt. College(A), Chittoor

I B.Sc., SEMESTER –I: ZOOLOGY PAPER – I

Subject Code: 19-ZOO-101

BLUE PRINT FOR THE MODEL PAPER

S. No.	Type of Question	To be given in the Question Paper			To be answered		
		No. of Questions	Marks allotted to each question	Total Marks	No. of Questions	Marks allotted to each question	Total Marks
1	Section-A (Short question)	10	5	50	5	5	25
2	Section-B (Short question)	10	10	100	5	10	50
Total Marks				150	Total Marks		75

BLUE PRINT FOR THE QUESTION PAPER SETTING

Chapter Name	Essay Question 10 Marks	Short Questions 5 Marks	Marks allotted to the Chapter
UNIT - I	2	2	30
UNIT - II	2	2	30
UNIT - III	2	2	30
UNIT - IV	2	2	30
UNIT - V	2	2	30
Total No. of Questions	10	10	150



PVKN Govt. College (A), Chittoor

I B.Sc., SEMESTER –I: ZOOLOGY PAPER –I

TITLE OF THE PAPER: ANIMAL DIVERSITY OF INVERTEBRATES

Subject Code: 19-ZOO-101

Time: 3Hrs

Max Marks: 75

MODEL QUESTION PAPER

Answer any Five of the following Questions

5X5=25

1. General characters of protozoa
2. Spicules
3. Coral reef formation
4. Flame cells
5. Leech
6. Vermi Compost
7. Appendages
8. Peripatus
9. Balanoglossus
10. Bipinnaria larva

Answer ALL of the following Questions

5X10=50

11. Describe the life cycle of Elphidium
[OR]
12. Describe the Canal system in Sponge.
13. Explain about the polymorphism in coelenterates
[OR]
14. Describe the life history of Fasciola hepatica
15. Write an essay on reproductive system of leech
[OR]
16. Write an essay on vermiculture
17. Write an essay on respiratory system of prawn
[OR]
18. Describe the process of torsion in Gastropoda
19. Describe the process of water vascular system in star fish
[OR]
20. Give a detailed account on the affinities of Balanoglossus



PVKN Govt. College(A), Chittoor

I B.Sc., SEMESTER –I: ZOOLOGY PAPER –I

TITLE OF THE PAPER: ANIMAL DIVERSITY OF INVERTEBRATES

Subject Code: 19-ZOO-101P

Credits :02

Teaching Hrs/Week: 3Hrs

PRACTICAL SYLLABUS

Animal Diversity of Invertebrates

Observation of the following slides/specimens/models

Protozoa: Elphidium, paramecium –Binary fission, Conjugation.

Porifera: Spongilla, Euspongia, Sycon, Sycon-L.S, T.S.

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

Platyhelminthes: Planaria, Fasciola hepatica larval stages of Meracidum, Redia, Cercaria, Echinococcus granulosus.

Nematehelminthes: Ascaris Male&Female, Ancylostoma duodenale.

Annelida: Neries, Heteroneries, Aphrodite, Hirudo, Trochophore larva.

Arthropoda: Nauplius, Mysis, Zoea Larvae, Anopheles, culex, mouth parts (Male&Female). house fly mouth parts. Scorpion, Crab, Prawn, scolopendra, Sacculina, Limulus, Paripatus.

Mollusca: Chiton, Murex, Sepia, Loligo, Octopus, Nautilus, Glochidium Larva.

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

Hemichordata : Balanoglossus, Tornaria larva.

Demonstration of dissection/dissected / Virtual Dissections: Leech / Prawn/Scorpion/Crab Digestive system, Prawn Appendages, Prawn/Scorpion/Crab Nervous System, Pila/Unio Digestive System, Mounting of statocyst Mounting of Radula.

- Compulsory one species to be adopted for demonstration only by the faculty.

- Computer Aided Techniques as per U.G.C Guidelines.

Laboratory record work shall be submitted at the time of Practical Examination, each practical batch should not have more than 20 students.

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PVKN Govt. College(A), Chittoor

I B.Sc., SEMESTER –I: ZOOLOGY PAPER –I

TITLE OF THE PAPER: ANIMAL DIVERSITY OF INVERTEBRATES

Subject Code: 19-ZOO-101P

Credits: 02

Teaching Hrs/Week: 03

PRACTICAL MODEL PAPER

I. Draw a Labeled diagram of virtual dissection/dissected animalsof
1X10 = 10M

II. Identification of six spotters/models/photographs, draw a labeled neatdiagram
with salient features. 6 x 5 = 30 M

*One from Protozoa or Porifera, one from Cnidaria, or Helminthes, two from Annelida or Arthropoda two from Mollusca, or Echinodermata, or Hemichordate.

III) Certified Record 10 M

Without Practical record –Student is not admitted for University exam Spotters

Scheme of evaluation

Identification & Classification	1 M
Labeled Diagram	2 M
Comments	



PVKN Govt. College(A), Chittoor
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Subject Code: 19-ZOO-101

Credits: 03

Teaching Hrs/Week: 04

QUESTION BANK

UNIT- 1

10 MARKS

1. Describe the general characters and outline classification up to classes of protozoa with examples
2. Describe the structure and life history of Elphidium
3. Describe the canal system in sponges

5 MARKS

4. Sycon
5. Spicules in sponges
6. Types of cells in sponges

UNIT- II

10 MARKS

1. Describe the structure and life cycle of Aurelia
2. Write about the polymorphism in coelenterates
3. Describe the life history of Fasciola hepatica
4. Describe the reproductive system in Fasciola
5. Describe the general characters and outline classification up to classes of Nematode helminthes

5 MARKS

6. Corals
7. Coral reefs
8. Flame cells
9. Sporocyst

UNIT – III

10 MARKS

1. Write an essay on reproductive system of leech
2. Give a detailed account on metamerism in Annelida
3. Write an essay on vermiculture
4. Write an essay on Haemocoelomic system of leech

5 MARKS

5. Hirudinaria
6. Vermicompost

UNIT – IV

10 MARKS

1. Write an essay on respiratory system of prawn
2. Discuss the general characters and affinities of peripatus
3. Write about the pearl formation in pelecypoda
4. Describe the process of torsion in gastropoda

5 MARKS

5. Appendages
6. Peripatus

UNIT – V

10 MARKS

1. Describe the process of Water vascular system in star fish
2. Describe the general characters and outline classification upto classes of phylum Hemichordata with examples
3. Give a detailed account on the affinities of Balanoglossus
4. Write the essay on regeneration in Echinodermata

5 MARKS

5. Bipinnaria Larva
6. Nauplius
7. Ephyra larva
8. Trochophore larva
9. Tornaria larva
10. Amphiblastula larva



PVKN Govt. College(A), Chittoor

I B.Sc., SEMESTER – II: ZOOLOGY PAPER – II

TITLE OF THE PAPER: ANIMAL DIVERSITY OF CHORDATES

Subject Code: 19-Zoo-202

Credits: 04

Teaching Hrs/Week: 4

SYLLABUS

UNIT – I: PROTO CHORDATA

1.1 General Characters of Chordates and its origin. 1.2 Protochordata: Sailer Features
1.2.1 Structure and life history of Herdmania 1.2.3 Significance of Retrogressive metamorphosis 1.2.4 *Structure and affinities of Amphioxus.

UNIT – II: CYCLOSTOMATA AND FISHES

2.1.1 General characters of Cyclostomes 2.1.2 Difference between Petromyzon and myxine 2.2 Fishes 2.2.1 General Characters of Fishes 2.2.2 Classification of fishes up to sub-class level with examples 2.2.3 Scoliodon-External features, Digestive system, Respiratory system, Heart, aortic arches, Brain. 2.2.4 Migration in fishes 2.2.5 Types of scales 2.2.6 *General account of dipnoi

UNIT – III: AMPHIBIA & REPTILIA

3.1 Amphibia 3.1.1 General characters of Amphibia 3.1.2 Classification of Amphibia upto orders with suitable examples 3.1.3 * Parental care in Amphibia 3.2 Reptilia 3.2.1 General Characters of Reptilia 3.2.2 Classification of Reptilia upto orders with examples 3.2.3 * Skull in Reptiles.

UNIT – IV: AVES

4.1 Aves 4.1.1 General Characters of Aves 4.1.2 Classification of Aves upto sub-classes with examples 4.1.3 Columba livia-External features, Digestive System, Respiratory systems, 4.1.4 Migration of Birds 4.1.5 Flight adaptations in Birds. 4.1.6 Evolutionary significance of Archaeopteryx.

UNIT – V: MAMMALIA AND ZOOGEOGRAPHY

5.1.1 General Characters of mammalia 5.1.2 Classification of Mammalia up to sub classes with examples 5.1.3 Dentition in Mammals 5.2. Zoogeography 5.2.1 Characteristics and fauna of Oriental region, Australian Region, Ethiopian Region.

Note: * marked are added topics to previous existing syllabus

Additional Inputs

1. Evolutionary significance and development of Chordates
2. Instinctive behaviour of petromyzon
3. Structure of vertebral column
4. Milk generation in Pigeon Crop
5. Hotspots in Oriental region

Suggested readings:

1. **E.L. Jordan and P.S Verma** 'Chordate Zoology' -S .Chand Publications
2. **Mohan P Arora** 'Chordata –I, Himalaya Publishing House Pvt.ltd.
3. **Marshall, Parker and Haswell** 'Text book of vertebrates.' ELBS and Mc Millan , England .
4. **Alfred Sherwood Romer**. Thomas S Pearson' The Vertebrates body, Sixth edition, CBS college publishing Saunders College Publishing.
5. **George C. Kent, Robert K Carr**. Comparative Anatomy of the Vertebrates, 9th ed. Mc Graw Hill.
6. **Kenneth Kardong Veretbrates** : Comparative Anantomy Function and Evolution, 4th ed, 'McGraw Hill.
7. **J.W. Young** The life of Vertebrates , 3rd ed, Oxford University Press.
8. **Harvey Pough F, Christine M Janis, B Heiser**, Vertebrate Life, Pearson 6th ed, pearson Education Inc. 2002.
9. **R.L Kotpal**, Modern text book of Zoology, Rastagi Publications.
10. **Pandey & Sukla** Fish and fishers 2nd Ed. Rastagi Publications.

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PVKN Govt. College(A), Chittoor

I B.Sc., SEMESTER –II: ZOOLOGY PAPER – II

Subject Code: 19-Zoo-202

BLUE PRINT FOR THE MODEL PAPER

S. No.	Type of Question	To be given in the Question Paper			To be answered		
		No. of Questions	Marks allotted to each question	Total Marks	No. of Questions	Marks allotted to each question	Total Marks
1	Section-A (Short Question)	10	5	50	5	5	25
2	Section-B (Essay Question)	10	10	100	5	10	50
Total Marks				150	Total Marks		75

BLUE PRINT FOR THE QUESTION PAPER SETTING

Chapter Name	Essay Question 10 Marks	Short Questions 5 Marks	Marks allotted to the Chapter
UNIT - I	2	2	30
UNIT - II	2	2	30
UNIT - III	2	2	30
UNIT - IV	2	2	30
UNIT - V	2	2	30
Total No. of Questions	10	10	150



PVKN Govt. College (A), Chittoor

I B.Sc., SEMESTER – II: ZOOLOGY PAPER – II

TITLE OF THE PAPER: ANIMAL DIVERSITY OF CHORDATES

Subject Code: 19-ZOO-102

Time: 3Hrs

Max Marks: 75

MODEL QUESTION PAPER

SECTION – A

Answer any Five of the following Questions

5X5 =25 Marks

1. General characters of Protochordata
2. Write about the Affinities of Amphioxus
3. Write Difference between Petromyzon and myxine
4. Write about the General Characters of Fishes
5. Write about the General Characters of Reptelia
6. Skull in Reptiles
7. Give an account of Migration of Birds
8. Evolutionary significance of Archaeopteryx
9. Write about General Characters of mammalia
10. Give an account on Comparison of Prototherians, Metatherians and Eutherians

SECTION – B

Answer ALL the following Questions

10X5 =50 Marks

Unit –I

11. Write about general Characters of Chordates and its origin

OR

12. Write about the structure and life history of Herdmania

Unit- II

13. Write about the classification of fishes up to sub class level with examples

OR

14. Explain the digestive system of Scoliodon

Unit –III

15. Describe the Digestive system in Rana hexadactyla

OR

16. Describe the Respiratory system in Rana hexadactyla

UNIT-IV

17. Describe the Digestive System of Columba livia

OR

18. Describe the Respiratory System of Columba livia

UNIT- V

19. Give an account on Characteristics and fauna of Oriental region

OR

20. Give an account on Characteristics and fauna of Australian Region



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I B.Sc., SEMESTER – II: ZOOLOGY PAPER – II
TITLE OF THE PAPER: ANIMAL DIVERSITY OF CHORDATES

Subject Code: 19-ZOO-201P

Credits : 02

Teaching Hrs/Week : 03

PRACTICAL SYLLABUS

Observation of the following Slides/Spotters/Models.

Protochordata : Herdmania , Amphioxus, Amphioxus T.S Through Pharynx

Cyclostomes : Petromyzon, Myxine

Pisces : Labeo rohita, Catla, Channa, Clarius, Hippo Campus, Exocoetus, Echeneis, Anguilla, Pristis, Tarpedo, Protapterous (Dipnoi fish)

Fish Scales- Placoid, Cycloid, Ctenoid Scales

Amphibla : Hyla , Rachophorus, Ichthyophis, siren, Amblystoma, Axolotal Larva.

Reptelia : Chamaeleon, Uromastix, Draco, Trionix, Naja, Bungarus, Enhydrina, Russels viper , Crocadilus.

Aves : Passer, Psittacula , Bubo, Allcedo, Columba, Carvas, Pavo

cristatus, Collection and study of different feathersquill, contour, Filopluma , down .

Mammalia : Ornithorhyncus, Tachyglossus, hedgehog, Loris, Manis.

Osteology : Appendicular Skelton of Pigeon, rabbit-Skull, Forelimbs, Hind Limbs , Pectoral and pelvic girdles.

Demonstration of dissection/ Dissected/ Virtual dissection.

1. Cranial Nerves : V,VII,IX,X cranial nerves of shark or locally available fish
2. Arterial system of Shark/Calotes/Fowl/Rat
3. Digestive System of Fish



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Chittoor

I B.Sc., SEMESTER – II: ZOOLOGY PAPER – II

TITLE OF THE PAPER: ANIMAL DIVERSITY OF CHORDATES

Subject Code: 19-ZOO-201P

Credits : 02

Teaching Hrs/Week : 03

PRACTICAL MODEL PAPER

MAX. MARKS -50

1. Identify the given dissection and Draw a labeled diagram 10M
2. Identify and comment on the following spotters and draw Labeled drawing A, B, C, D, E, F, G (One each from Prochordates, Fishes, Amphibia, Reptiles, Aves, and Osteology) 6 X5 = 30 M
3. Certified Practical record 10 M

Without Practical record –Student is not admitted for exam

1. Spotters Identification 1 M
2. Classification Labeled Diagram -2 M
3. Comments -2 M

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Chittoor

I B.Sc., SEMESTER – II: ZOOLOGY PAPER – II

TITLE OF THE PAPER: ANIMAL DIVERSITY OF CHORDATES

Subject Code: 19-Zoo-202

Credits: 03

Teaching Hrs/Week: 4

QUESTION BANK

UNIT – I (Proto Chordata)

Essay type questions

1. Write about general Characters of Chordates and its origin
2. Write about the structure and life history of Herdmania
3. Explain the Retrogressive metamorphosis in Herdmania

Short answer type questions

1. General characters of Protochordata
2. Write about the Affinities of Amphioxus
3. Urochordata

UNIT – II (Cyclostomata and Fishes)

Essay type questions

1. Write about the classification of fishes up to sub class level with examples
2. Explain the digestive system of Scoliodon
3. Explain the Respiratory system of Scoliodon
4. Give an account of Migration in Fishes
5. Describe the excretory system in scoliodon
6. Give the general account of dipnoi

Short answer type questions

1. Give an account of general characters of Cyclostomes
2. Write Difference between Petromyzon and myxine
3. Write about the General Characters of Fishes
4. Types of scales
5. Give the general account of dipnoi

UNIT – III (Amphibia & Reptilia)

Essay type questions

1. Give the classification of Amphibia up to orders with suitable examples
2. Parental care in Amphibia
3. Describe the Digestive system in Rana hexadactyla
4. Describe the Respiratory system in Rana hexadactyla
5. Write about the classification of Reptelia
6. Skull in Reptiles

7. Give an account of Identification of poisonous snakes and non-poisonous snakes.

Short answer type questions

1. Give the General characters Amphibia
2. Write about the General Characters of Reptelia
3. Skull in Reptiles
4. Apoda
5. Rhyncocephalia
6. Crocodelia

UNIT – IV (Aves)

Essay type questions

1. Write about the Classification of Aves upto sub-classes with examples
2. Describe the Digestive System of Columba livia
3. Describe the Respiratory System of Columba livia
4. Write about of Flight adaptations in Birds

Short answer type questions

1. Give the General Characters of Aves
2. Give an account of Migration of Birds
3. Evolutionary significance of Archaeopteryx
4. Ratitae
5. Write about of importance of pecten and functions in the eye of pigeon
6. Types of feathers in birds.
7. Evolutionary significance of Archaeopteryx

UNIT – V (Mammalia and Zoogeography)

Essay type questions

1. Write about Classification of Mammalia up to sub classes with examples
2. Write an essay on Dentition in Mammals
3. Give an account on Characteristics and fauna of Oriental region
4. Give an account on Characteristics and fauna of Australian Region

Short answer type questions

1. Write about General Characters of mammalia
2. Give an account on Comparison of Prototherians, Metatherians and Eutherians
3. Give an account on Characteristics and fauna of Ethiopian Region

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PVKN Govt. College(A), Chittoor
II B.Sc., SEMESTER –III: ZOOLOGY (Subject) PAPER – III
Title of the Paper: CYTOLOGY, GENETICS AND EVOLUTION

Subject Code: 19-ZOO-201

Credits: 04

Teaching Hrs/Week: 04

SYLLABUS

Unit – I: Cytology

1.1 Definition, history, prokaryotic and eukaryotic cells, virus, viroids, mycoplasma. 1.2 Electron microscopic structure of eukaryotic cell. 1.3 Plasma membrane – Different models of plasma membrane stressed fluid mosaic model. Functions of plasma membrane in orientation of exo cytosis, Endo cytosis, Phagocytosis, Pino cytosis, Active and Passive transport.

Unit – II: 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. Chromatin - Structure and significance, Chromosomes - Structure, types, functions.

Unit – III: Genetics -1

3.1.1 Principles of inheritance in brief. 3.1.2 Incomplete dominance and codominance. 3.1.3 Lethal alleles, Epistasis, Pleiotropy, Multiple Alleles (ABO Blood grouping).

Unit – IV: Genetics - II

4.1.1 Sex determination – chromosomal mechanisms – XX – XO , XX – XY, ZZ – ZW type , Genic balance theory of Bridges, Dosage compensation in man. 4.1.2 Sex linked inheritance – Eye color in Drosophila, Hemophilia and Color. Blindness in man. 4.1.3 Extra chromosomal inheritance. 4.1.4 Human karyotyping.

Unit – V: Evolution

5.1.1 Origin of life – Biogenesis, Abiogenesis, Cosmozoic theory, Urey and Millers experiment. 5.1.2 Lamarckism, Darwinism, Neo – Darwinism, Hardy-Weinberg Equilibrium. 5.1.3 Variations, isolating mechanisms, natural selection. 5.1.4 Types of natural selection (directional, stabilizing, disruptive). 5.1.5 *Evolution of man through ages*. 5.1.6 Speciation (Allopatric and Sympatric). 5.1.7 Macro evolutionary principles (Example: Darwin's finches)

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PVKN Govt. College(A), Chittoor
II B.Sc., SEMESTER – III: ZOOLOGY (Subject) PAPER – III

Subject Code: 19-ZOO-201

BLUE PRINT FOR THE MODEL PAPER

S. No.	Type of Question	To be given in the Question Paper			To be answered		
		No. of Questions	Marks allotted to each question	Total Marks	No. of Questions	Marks allotted to each question	Total Marks
1	Short answers	10	5	50	5	5	25
2	Essay questions	10	10	60	5	10	50

BLUE PRINT FOR THE QUESTION PAPER SETTING

Chapter Name	Essay Question 10 Marks	Short Questions 5 Marks	Marks allotted to the Chapter
UNIT - I	2	2	30
UNIT - II	2	2	30
UNIT - III	2	2	30
UNIT - IV	2	2	30
UNIT - V	2	2	30
Total No. of Questions	10	10	150



PVKN Govt. College (A), Chittoor

II B.Sc., SEMESTER – III: ZOOLOGY (Subject) PAPER – III

Title of the Paper: CYTOLOGY, GENETICS AND EVOLUTION

Subject Code: 18-ZOO-201

Time : 3Hrs

Max Marks : 75

MODEL QUESTION PAPER

SECTION – A

Answer any Five of the following Questions

5X5 =25 Marks

1. Virus
2. Lysosomes
3. Multiple alleles
4. Human Karyotype
5. Lamarckism
6. Urey and Millers experiment
7. Chromatin
8. XX – XO
9. Incomplete dominance
10. *Phago cytosis*

SECTION – B

Answer all the following Questions

5X10 =50 Marks

Unit –I

11. Comparison between Prokaryotic and Eukaryotic cell
- OR**

12. Structure of Plasma membrane and its functions

Unit- II

13. Write an essay on endoplasmic reticulum
- OR**

14. Chromosome structure and function

Unit –III

15. Write a brief note on Epistasis
- OR**

16. Write a brief note on Principles of inheritance

Unit- IV

17. Write an essay on Sex determination
- OR**

18. Write an essay on Sex linked inheritance in drosophila

Unit –V

19. Write an essay on Hardy-Weinberg Equilibrium and its significance?
- OR**

20. Write an essay on Allopatric and sympatric speciation

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PVKN Govt. College(A), Chittoor
II B.Sc., SEMESTER – III: ZOOLOGY (Subject) PAPER – III
Title of the Paper: CYTOLOGY, GENETICS AND EVOLUTION

Subject Code: 19-ZOO-201 P

Credits: 02

Teaching Hrs/Week: 03

PRACTICAL SYLLABUS

Observation of the following slides/specimens/models

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 picture
- 3) Evolution of man through ages with pictures (Added because it is important for competition exams).
4. Darwin's finches (pictures)
5. Visit to natural history museum and submission of report

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PVKN Govt. College(A), Chittoor
II B.Sc., SEMESTER – III: ZOOLOGY (Subject) PAPER – III
Title of the Paper: CYTOLOGY, GENETICS AND EVOLUTION

Subject Code: 19-ZOO-201 P

Credits: 02

Teaching Hrs/Week: 03

PRACTICAL MODEL PAPER

1. Squash preparation of onion root tip for mitotic chromosomes 10M
OR

Mounting of salivary glands of chromosomes of Chironomus larva

2. Identify and comment on the following spotters 5 x 6 = 30M

1. Mitosis stage – I
2. Meiosis stage – I
3. Human karyotype
4. Homo rhodesiense
5. Hardy Weinberg law

2. Certified record 10M

Spotters-

Identification –

1 Mark

Diagram -

2 Marks

Comments –

2 Marks

Certified practical record is compulsory. Student is not admitted to practicals with put record book.

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Title of the Paper: CYTOLOGY, GENETICS AND EVOLUTION

Subject Code: 19-ZOO-201

Credits: 03

Teaching Hrs/Week: 03

QUESTION BANK

UNIT – I (Cytology)

Essay type questions

- Q1. Give detailed account on Electron microscopic structure of Eukaryotic cell
- Q2. Describe the Plasma membrane structure
- Q3. Write about the functions of Plasma membrane

Short answer type questions

- Q1. Differences between prokaryotic cell and Eukaryotic cell
- Q2. Mycoplasma
- Q3. Corona virus
- Q4. Viroid's

UNIT – II (CELL ORGANELLS)

Essay type questions

- Q1. Describe the structure and functions of Ribosome
- Q2. Krebs's cycle
- Q3. Give the detailed account on structure and types of Chromosomes

Short answer type questions

- Q1. Give the Structure and functions of Endoplasmic reticulum
- Q2. Give the Structure and functions of Golgi apparatus
- Q3. Give the Structure and functions of Lysosomes

UNIT – III (GENETICS-I)

Essay type questions

- Q1. Give detailed account on Epistasis
- Q2. Describe the multiple alleles

Short answer type questions

- Q1. Mendilian principles
- Q2. Co-dominance
- Q3. In complete dominance

- Q4. Lethal alleles
- Q5. Pleiotrophism

UNIT – IV (GENETICS-II)

Essay type questions

- Q1. Describe the Chromosomal method of Sex determination
- Q2. Discuss the sex linked inheritance with any three examples
- Q3. Write about the Sex determination in Drosophila

Short answer type questions

- Q1. Barr body
- Q2. Human karyotyping
- Q3. Hemophilia
- Q4. Color blindness

UNIT – V(EVOLUTION)

Essay type questions

- Q1. Give detailed account on Isolation
- Q2. Speciation
- Q3. Describe the Urey and Miller's experiment in the origin of life
- Q4. Neo-darwinism

Short answer type questions

- Q1. Lamarkism
- Q2. Darwinism
- Q3. Natural selection
- Q4. Cosmozoic theory of origin of life

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PVKN Govt. College(A), Chittoor

II B.Sc., SEMESTER –IV: ZOOLOGY (Subject) PAPER – IV

Title of the Paper:(EMBRYOLOGY, PHYSIOLOGY, ECOLOGY&ANIMAL BEHAVIOUR)

Subject Code: 19-ZOO-401

Credits: 04

Teaching Hrs/Week: 04

SYLLABUS

Unit – I: Developmental Biology and Embryology

1.1.1 Gametogenesis (Spermatogenesis and Oogenesis).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. Development, types and functions of Placenta in mammals.

Unit – II: Physiology - I

2.1.1 Elementary study of process of digestion.2.1.2 Absorption of digested food2.1.3 Respiration - Pulmonary ventilation, transport of oxygen and carbondioxide2.1.4 Circulation - Structure and functioning of heart, Cardiac cycle.2.1.5 Excretion – Structure of nephron, urine formation, counter current mechanism

Unit – III: Physiology – II

3.1.1 Nerve impulse transmission - Resting membrane potential, origin and propagation of action potentials along myelinated and non-myelinated nerve fibers3.1.2Muscle contraction –Ultra structure of muscle fiber,Sliding filament theory of muscle contraction. 3.1.3 Endocrine glands - Structure, secretions and the functions (of hormones)of pituitary, thyroid, parathyroid, adrenal glands, pancreas and gonads(Testis & Ovaries).

Unit – IV:Ecology – I

4.1.1 Meaning and scope of Ecology 4.1.2 Pond Ecosystem– Biotic and Abiotic factors - Temperature, light, water,food chain & Energy flow. 4.1.3 Bio geo - Chemical cycles - Nitrogen, carbon and phosphorus. 4.1.4 Animal Habitat & ecological niche and Ecological succession.4.1.4 Components of Ecosystem (Example:lake), 4.1.5 Community interactions - Mutualism, Commensalism, Parasitism, Competition, Predation.

Unit - V: Animal Behaviour

5.1. Animal Behaviour: Definition & Types 5.2. Innate Behaviour: Taxes & Reflexes –Brief outline of Communication in Animals (Added because of important topic for higher studies). 5.3. Learned Behaviour: Associate Learning (E.g.Classical Conditioning & Instrumental Learning). 5.4 Learning & Memory. 5.5 Biological Clocks & Circadian Rhythms

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PVKN Govt. College(A), Chittoor
II B.Sc., SEMESTER – IV: ZOOLOGY (Subject) PAPER – IV

Subject Code: 19-ZOO-401

BLUE PRINT FOR THE MODEL PAPER

S. No.	Type of Question	To be given in the Question Paper			To be answered		
		No. of Questions	Marks allotted to each question	Total Marks	No. of Questions	Marks allotted to each question	Total Marks
1	Section-A (Short Question)	10	5	50	5	5	25
2	Section-B (Essay Question)	10	10	100	5	10	50
Total Marks				150	Total Marks		75

BLUE PRINT FOR THE QUESTION PAPER SETTING

Chapter Name	Essay Question 10 Marks	Short Questions 5 Marks	Marks allotted to the Chapter
UNIT – I	02	02	30
UNIT – II	02	02	30
UNIT – III	02	02	30
UNIT – IV	02	02	30
UNIT – V	02	02	30
Total No. of Questions	10	10	150

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PVKN Govt. College (A), Chittoor

II B.Sc., SEMESTER –IV: ZOOLOGY (Subject) PAPER –IV

Title of the Paper: (EMBRYOLOGY, PHYSIOLOGY, ECOLOGY & ANIMAL BEHAVIOUR)

Subject Code: 19-ZOO-401

Time: 3Hrs

Max Marks : 75M

MODEL QUESTION PAPER

SECTION – A

Answer any Five of the following Questions

5X5 =25 Marks

1. Foetal membranes in chicks
2. Fertilization
3. Structure of Nephron
4. Synaptic transmission
5. Structure of Skeletal Muscle
6. Ecological niche
7. Commensalism
8. Reflexes
9. Taxes
10. Parathyroid

SECTION – B

Answer ALL the following Questions

5X10 =50 Marks

Unit –I

11. Describe Gametogenesis

OR

12. Write about types and functions of Placenta in mammals

Unit- II

13. Describe the carbohydrates and protein digestion

OR

14. Describe the structure of human heart

Unit –III

15. Describe sliding filament theory

OR

16. Explain pituitary secretions and its functions

Unit- IV

17. Define biogeochemical cycles explain nitrogen cycle

OR

18. Write about mutualism, competition and predation

Unit –V

19. What is associated learning explain it with reference to two examples you have studied

OR

20. Define Animal Behaviour explain different type of behaviour.

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PVKN Govt. College(A), Chittoor

II B.Sc., SEMESTER –IV: ZOOLOGY (Subject) PAPER –IV

**Title of the Paper:(EMBRYOLOGY, PHYSIOLOGY, ECOLOGY&ANIMAL
BEHAVIOUR)**

Subject Code: 19-ZOO-401

Credits: 02

Teaching Hrs/Week: 04

QUESTION BANK

Unit - I

Developmental Biology and Embryology

Essay type questions

- Q1. Describe the process of Spermatogenesis
- Q2. Describe the process of Oogenesis
- Q3. Write about various Types of cleavages.
- Q4. Write an Essay on Placenta in mammals.

Short answer type questions

- Q1. Give an account on Fertilization.
- Q2. Write about various Types of eggs.

Unit - II

Physiology – I

Essay type questions

- Q1. Write about the detailed account on process of Digestion of Proteins and Carbohydrates.
- Q2. Give an account of transportation of Respiratory gases
- Q3. Describe the structure of the Human Heart with the help of labelled diagram
- Q4. Write notes on the working of the Heart of Man
- Q5. Describe Arrhythmia
- Q6. Describe the structure of Nephron
- Q7. Explain the physiology of Urine formation

Short answer type questions

- Q1. Explain the Mechanism of Absorption of digested food.
- Q2. Write about Gastro Intestinal hormones.
- Q3. Write about Respiratory pigments
- Q4. Discuss briefly about Open and closed circulation
- Q5. Describe Cardiac cycle
- Q6. Describe the structure of Nephron

Unit - III

Physiology – II

Essay type questions

Q1. Explain the transmission of nerve impulse through a nerve fibre with the help of suitable diagrams

Q2. Explain the mechanism of muscle contraction

Q3. Write about the hormones of Pituitary gland

Short answer type questions

Q1. Give an account of synaptic transmission

Q2. Write about any three neurotransmitters

Q3. Write about the structure of Muscle

Q4. Cori cycle

Q5. Adrenal gland

Unit – IV

Ecology

Essay type questions

Q1. Temperature as an Ecological factor – Discuss it

Q2. Write about the Energy flow in an ecosystem

Q3. Write about Biogeochemical cycles

Q4. Give detailed account on Ecological succession

Short answer type questions

Q1. Write about the various food chains

Q2. Ecological Niche

Q3. Parasitism

Q4. Commensalism

Q5. Phosphorus cycle

Unit - V

Animal Behaviour

Essay type questions

Q1. Write about the taxes and reflexes

Q2. Classical conditioning and instrumental learning

Q3. Biological clocks

Short answer type questions

Q1. Memory

Q2. Circadian rhythms

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P.V.K.N. Govt. College(A), Chittoor

III B.Sc., SEMESTER –V: Zoology PAPER – 5 ANIMAL BIOTECHNOLOGY

Subject Code: 21-ZOO-501

Credits : 03

Teaching Hrs/Week : 4

Periods:60Max. Marks:100

Unit 1: Tools of Recombinant DNA technology - Enzymes and Vectors

Restriction modification systems: Types I, II and III. Mode of action, nomenclature, applications of Type II restriction enzymes in genetic engineering

DNA modifying enzymes and their applications: DNA polymerases–kinases and phosphatases, DNA ligases and **Reverse transcriptase** Cloning Vectors: Plasmid vectors:pBR and pUC series, Bacteriophage lambda and M13 based vectors, Cosmids, BACs, YACs,

Unit 2 Techniques of Recombinant DNA technology

Cloning: Use of linkers and adaptors

Gene delivery: Microinjection, electroporation, biolistic method (gene gun), liposome and viralmediated delivery

PCR: Basics of PCR. &Its applications, **Basics of RT-PCR&its applications**

DNA Sequencing: Sanger's method of DNA sequencing

Hybridization techniques: Southern, Northern and Western blotting,

Genomic and cDNA libraries: Preparation and uses

Recombinant insulin &human growth hormone

Gene therapy

UNIT 3 Animal Cell Technology

Cell culture media: Natural and Synthetic

Cell cultures:Primary culture, secondary culture, continuous cell lines; Protocols for Primary Cell Culture; Established Cell lines (common examples such as MRC, HeLa, CHO, BHK, Vero); Organ culture; Cryopreservation of cultures.

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

Stem cells: Types of stem cells, applications ,**Stem cell therapy**

Unit 4 Reproductive Technologies & TransgenicAnimals

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; applications ,Ethical concerns regarding Transgenesis

Unit 5 Applied Biotechnology Industry: Fermentation: Different types of Fermentation: Short notes on - Submerged & Solid state; batch, Fed batch & Continuous; Stirred tank, Air Lift, Fixed Bed and Fluidized; Downstream processing - Filtration, centrifugation, extraction, chromatography, spray drying and lyophilization

Agriculture: fisheries –*Genetically modified fishes*, monoculture in fishes, polyploidy in fishes; DNA fingerprinting

SUGGESTED READING

1. Brown TA. (2010). Gene Cloning and DNA Analysis. 6th edition. Blackwell Publishing, Oxford, U.K.
2. Clark DP and Pazdernik NJ. (2009). Biotechnology: Applying the Genetic Revolution. Elsevier Academic Press, USA
3. Primrose SB and Twyman RM. (2006). Principles of Gene Manipulation and Genomics, 7th edition. Blackwell Publishing, Oxford, U.K.
4. Sambrook J and Russell D. (2001). Molecular Cloning-A Laboratory Manual. 3rd edition. Cold Spring Harbor Laboratory Press
5. Wiley JM, Sherwood LM and Woolverton CJ. (2008). Prescott, Harley and Klein's Microbiology. McGraw Hill Higher Education
6. Brown TA. (2007). Genomes-3. Garland Science Publishers
7. Primrose SB and Twyman RM. (2008). Genomics: Applications in human biology. Blackwell Publishing, Oxford, U.K.
8. Animal Cells Culture and Media, D.C. Darling and S.J. Morgan, 1994.BIOS Scientific Publishers Limited.
9. Methods in Cell Biology, Volume 57, Jennie P. Mathur and David Barnes, 1998. Animal Cell Culture Methods Academic Press.
10. P.K. Gupta: Biotechnology and Genomics, Rastogi publishers (2003).
11. B.D. Singh: Biotechnology, Kalyani publishers, 1998 (Reprint 2001)

PVKN Govt. College(A), Chittoor

III B.Sc., SEMESTER –V: Zoology PAPER – V
(ANIMAL BIOTECHNOLOGY)

Subject Code: 21-Zoo-501

Credits : 03

Teaching Hrs/Week : 4

BLUE PRINT FOR THE MODEL PAPER

S. No.	Type of Question	To be given in the Question Paper			To be answered		
		No. of Questions	Marks allotted to each question	Total Marks	No. of Questions	Marks allotted to each question	Total Marks
1	Short Answers	10	5	50	5	5	25
2	Essays	10	10	100	5	10	50
							75

BLUE PRINT FOR THE QUESTION PAPER SETTING

Chapter Name	Essay Question 10 Marks	Short Questions 5 Marks	Marks allotted to the Chapter
UNIT - I	2	2	15
UNIT - II	2	2	15
UNIT - III	2	2	15
UNIT - IV	2	2	15
UNIT - V	2	2	15
Total No. of Questions	10	10	75

PVKN Govt. College(A), Chittoor
III B.Sc., SEMESTER –V: ZOOLOGY PAPER – V
(ANIMAL BIOTECHNOLOGY)

Subject Code: 21-ZOO-501

Time : 3hrs

Max Marks : 75

MODEL QUESTION PAPER

SECTION – A

Answer any FIVE of the following 5×5=25M

Draw labelled diagrams wherever necessary

- 1.DNA polymerase
- 2.Cosmid
- 3.Linkers
- 4.Gene therapy
- 5.Natural cell culture media
- 6.Cryopreservation
- 7.cell fusion
- 8.Artificial insemination
- 9.Chromatography
- 10.DNA finger printing

SECTION -B

Answer any FIVE of the following

5×10=50M

Draw labelled diagrams wherever necessary

11.a)Give an account on Restriction Endonuclease enzymes and its applications

OR

b) Describe DNA modifying enzymes and their applications

12.a)Write methods of Gene delivery process.

OR

b)Write about basics of PCR and its applications

13.a)Explain about established or continuous cell lines with suitable examples.

OR

b)Write about stem cells and its applications.

14.a)Explain Embryo Transfer and Embryo cloning.

OR

b)Write about transgenic animals and its applications.

15.a)What is Fermentation Technology and write types of Fermentation

OR

b)Explain in detail about Down stream processing

SYLLABUS

UNIT – I

:

10 Hours

General introduction to poultry farming. - Central Pollution control board regulations on Poultry- Principles of poultry housing. Poultry houses. Systems of poultry farming. Management of chicks, growers and layers. Management of Broilers.

UNIT – II:

10 Hours

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. General hygiene prevention & control measures of infectious diseases of poultry, External parasites prevention methods

UNIT – III:

10 Hours

Selection, care and handling of hatching eggs. Quality in fresh – Laid eggs. Methods of hatching. Brooding and rearing. Sexing of chicks.

UNIT- IV:

20 Hours

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 – loose, housing system. Conventional dairy barn. Cleaning and sanitation of dairy farm. Weaning of calf. Castration and dehorning. Deworming and Vaccination programme. Records to be maintained in a dairy farm.

UNIT - V:

10 Hours

Care and management of dairy animals - Care and management of calf, heifer, milk animal, dry and pregnant animal, bulls and bullocks. Government sponsored programmes, General hygiene prevention & control measures of infectious diseases of livestock & poultry, Classification of common livestock feeds.

**III B.Sc., SEMESTER – V: Zoology
Animal Husbandry**

**Subject Code: 21-ZOO-502
BLUE PRINT FOR THE MODEL PAPER**

S. No.	Type of Question	To be given in the Question Paper			To be answered		
		No. of Questions	Marks allotted to each question	Total Marks	No. of Questions	Marks allotted to each question	Total Marks
1	Short Answers	10	5	50	5	5	25
2	Essays	10	10	100	5	10	50
							75

BLUE PRINT FOR THE QUESTION PAPER SETTING

Chapter Name	Essay Question 10 Marks	Short Questions 5 Marks	Marks allotted to the Chapter
UNIT - I	2	2	15
UNIT - II	2	2	15
UNIT - III	2	2	15
UNIT - IV	2	2	15
UNIT - V	2	2	15
Total No. of Questions	10	10	75

PVKN Govt. College(A), Chittoor

III B.Sc., SEMESTER –V: ZOOLOGY PAPER – V
(ANIMAL HUSBANDRY)

Subject Code: 21-ZOO-502

Time : 3hrs

Max Marks : 75

MODEL QUESTION PAPER

SECTION – A

Answer any Five of the following Questions

5X3 =15 Marks

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

SECTION – B

Answer ALL the following Questions

5X3 =15 Marks

Unit –I

11

Or

12

Unit- II

13

Or

14

Unit –III

15

Or

16

Unit- IV

17

Or

18

Unit –V

19

Or

20

PVKN Govt. College(A), Chittoor

III B.Sc., SEMESTER –V: Zoology PAPER – VI
(ANIMAL Husbandry)

Subject Code: 21-ZOO-502

Credits : 3

Teaching Hrs/Week : 3

QUESTION BANK

UNIT – I (General introduction to poultry farming)

Essay type questions

- Q1. Write about the principles of housing in a layout of poultry farm.
- Q2. Give a detailed account of different types of poultry houses.
- Q3. Describe the management of Broilers
- Q4. Describe the management of Layers.
- Q5 Describe the management of Brooders
- Q6 Describe the management of Growers

Short answer type questions

- Q1. Quarantine room
- Q2. Light importance in layer birds
- Q3. Temperature importance in Brooder birds
- Q4. Layout importance in poultry farm
- Q5. Spent out chickens and Loafers
- Q6. Culling
- Q7. Deep litter system

UNIT – II (Poultry feed management)

Essay type questions

- Q1. Write about the nutrient requirements in Broilers.
- Q2. Write about the nutrient requirements in Layers
- Q3. Write about the different types of feeding mechanisms.
- Q4. Write about the diseases any four diseases causative by virus, bacteria and Fungus

Short answer type questions

- Q1. Pearson formula
- Q2. Feeding restriction
- Q3. Ranikhet
- Q4. Pneumonia

UNIT – III

Essay type questions

- Q1. Write about the Selection and care of eggs
- Q2. Write about the egg testing mechanisms.

Q3. Explain about different types of hatching methods.

Q4. Write about the sexing in chick

Short answer type questions

Q1. candle test

Q2. Vent sexing

Q3. Natural brooding

UNIT – IV

Essay type questions

Q1. Explain about Indian milching cow breeds

Q2. Write about the different breeding methods

Q3. Write about the housing of dairy animals.

Short answer type questions

Q1. Murra

Q2. Weaning

Q3. Exotic cattle breeds

Q4. Conventional Barn

UNIT – V (Care and management of dairy animals)

Essay type questions

Q1. Write about the caring of Calf's.

Q2. Explain about the caring of Milching animals.

Q3 Explain about the caring of Pregnant animal

Short answer type questions

Q1. Heifer

Q2. Colostrum importance

Q3. Concentrate feed importance in cattle's

Q4. General hygiene practices in a dairy

PVKN Govt. College(A), Chittoor
III B.Sc., SEMESTER –VI: ZOOLOGY PAPER – VII – A
IMMUNOLOGY

Subject Code: 21-ZOO-601

Credits: 03

Teaching Hrs/Week: 3

Unit - I

1.1 Overview of Immune system

- 1.1.1 Introduction to basic concepts in Immunology
- 1.1.2 Innate and adaptive immunity

1.2 Cells and organs of Immune system

- 1.2.1 Cells of immune system
- 1.2.2 Organs of immune system, Negative, Positive selection of T cells

Unit - II

2.1 Antigens

- 2.1.1 Basic properties of antigens
- 2.1.2 B and T cell epitopes, haptens and adjuvants
- 2.1.3 Factors influencing immunogenicity
- 2.1.4 Chemical nature of antigens and antigenic determinants.

Unit - III

3.1 Antibodies

- 3.1.1 Structure and biological properties of antibody
- 3.1.2 Classes and functions of antibodies
- 3.1.3. Monoclonal antibodies

Unit - IV

4.1 Working of Immune system

- 4.1.1 Structure and functions of major histocompatibility complexes
- 4.1.2 Exogenous and Endogenous pathways of antigen presentation and processing

Unit - V

5.1 Immune system in health and disease

- 5.1.1 Classification and brief description of various types of hyper sensitivities, understanding the effect of COVID – 19 on hypersensitivity patients , different variants of corona (not for examination purpose) Autoimmune disorders: definition, pathogenesis of autoimmune diseases, auto immune haemolytic anaemia, Addisons disease and rheumatoid arthritis.

5.2 Vaccines

- 5.2.1 General introduction to vaccines
- 5.2.2 Types of vaccines



PVKN Govt. College(A), Chittoor
III B.Sc., SEMESTER – VI: ZOOLOGY PAPER – VI
TITLE OF THE PAPER: Immunology core

Subject Code: 21-ZOO-601

Credits: 04

Teaching Hrs/Week: 4

BLUE PRINT FOR THE MODEL PAPER

S. No.	Type of Question	To be given in the Question Paper			To be answered		
		No. of Questions	Marks allotted to each question	Total Marks	No. of Questions	Marks allotted to each question	Total Marks
1	Short Answers	8	5	40	5	5	25
2	Essays	10	10	100	5	10	50

BLUE PRINT FOR THE QUESTION PAPER SETTING

Chapter Name	Essay Question 10 Marks	Short Questions 5 Marks	Marks allotted to the Chapter
UNIT - I	2	2	30
UNIT - II	2	2	30
UNIT - III	2	2	30
UNIT - IV	2	1	25
UNIT - V	2	1	25
Total No. of Questions	10	8	140



PVKN Govt. College(A), Chittoor
III B.Sc., SEMESTER – VI: ZOOLOGY PAPER – VI
TITLE OF THE PAPER: Immunology core

Subject Code: 21-ZOO-601

Credits: 03

Teaching Hrs/Week: 4

Time: 3 hrs

Max. Marks: 75

I. Answer any FIVE of the following:

5x5=25

Draw labeled diagrams wherever necessary

1. Innate immunity
2. Thymus gland
3. B Lymphocytes
4. Epitope
5. Ig- G
6. Monoclonal antibodies
7. MHC I
8. Vaccine

II. Answer any FIVE of the following:

5x10=50

Draw labelled diagrams wherever necessary

9.A) Explain the Adaptive immunity

OR

B) Describe the different organs in immune system

10 A). Give detailed account on the properties of antigens

OR

B). Discuss about the factors of the immunogenicity

11 A). Describe about the model structure of immunoglobulins.

OR

B). Write about the hybridoma technology and applications of Monoclonal antibodies

12) A) Write about the Major histocompatibility complexes and its structure with a labelled diagrams

OR

B) Explain the exogenous pathway

13 A) Write about the different types of Hypersensitivities.

OR

B) Write about any two autoimmune disorders.

QUESTION BANK :-

ESSAY QUESTIONS:-(10 MARKS)

UNIT 1

1. Write an essay on innate immunity.
2. Describe the organs of immune system .
3. Explain the cells of immune system.

UNIT II

1. Explain the basic properties of antigen.
2. Factors influencing the immunogenicity.
3. Chemical nature of antigen and antigenic determinants.

UNIT III

1. Structure and biological properties of antibodies.
2. Explain the production of Monoclonal antibodies.

UNIT IV

1. Structure and functions of major histocompatibility complexes
2. Exogenous pathways of antigen presentation and processing
3. Endogenous pathways of antigen presentation and processing

Unit - V

1. Explain the classification and brief description of various types of hyper sensitivities.
2. Explain the given below two auto immune diseases
A. Auto immune haemolytic anaemia,
B. Rheumatoid arthritis.
3. Write an essay on vaccine.

SHORT QUESTIONS:- (5 MARKS):-

1. B – lymphocytes.
2. T – lymphocytes.
3. Phagocytes.
4. Bone marrow.
5. Antigen.
6. Epitope and paratope.
7. Haptens and adjuvants.
8. Ig- G
9. Immunogenicity.
10. Classes of immunoglobulins.
11. MHC II.
12. Addison's disease.
13. Vaccines.
- 14.

P.V.K.N. Govt. College(A), Chittoor
III B.Sc., SEMESTER –VI: ZOOLOGY CLUSTER ELECTIVE
PAPER – VIII -B-I **PRINCIPLES OF AQUACULTURE**

Paper code:21-ZOO-602

Periods:60

Credits: 3

Max. Marks:75 M

Unit – I

1.1 Introduction / Basics of Aquaculture

- 1.1.1 Concept of Blue Revolution, 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.

Unit – II

2.1 Types of Aquaculture

- 2.1.1 Freshwater, Brackishwater and Marine
- 2.1.2 Concept of Monoculture, Polyculture, Composite culture, Monosex culture and Integrated fish farming,

2.2 Culture systems

- 2.2.1 Ponds, Raceways, Cages, Pens, Rafts and water recirculating systems

2.3 Culture practices

- 2.3.1 Traditional, extensive, semi-intensive and intensive cultures of fish .

Unit – III

3.1 Design and construction of aquafarms

- 3.1.1 Criteria for the selection of site for freshwater and brackish water pond farms
- 3.1.2 Design and construction of fish 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 Fish Nutrition: Nutritional requirements of a cultivable fish and shellfish
- 3.3.2 Natural food and Artificial feeds and their importance in fish culture

Unit – IV

4.1 Management of carp culture ponds

- 4.1.1 Culture of Indian major carps: Pre-stocking management – Dewatering, drying, 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

Unit – V

5.1 Culture of shrimp (*Penaeus monodon*)

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.

PVKN Govt. College(A), Chittoor

III B.Sc., SEMESTER – VI: Zoology Cluster -VIII-BI
PRINCIPLES OF AQUACULTURE

Subject Code: 21-ZOO-602

BLUE PRINT FOR THE MODEL PAPER

S. No.	Type of Question	To be given in the Question Paper			To be answered		
		No. of Questions	Marks allotted to each question	Total Marks	No. of Questions	Marks allotted to each question	Total Marks
1	Short Answers	8	5	40	5	5	25
2	Essays	10	10	100	5	10	50
							75

BLUE PRINT FOR THE QUESTION PAPER SETTING

Chapter Name	Essay Question 10 Marks	Short Questions 5 Marks	Marks allotted to the Chapter
UNIT - I	2	2	30
UNIT - II	2	2	30
UNIT - III	2	2	30
UNIT - IV	2	1	25
UNIT - V	2	1	25
Total No. of Questions	10	10	140

P.V.K.N. Govt. College(A), Chittoor
III B.Sc., SEMESTER –VI: ZOOLOGY CLUSTER ELECTIVE
PAPER – VIII -B-IPRINCIPLES OF AQUACULTURE

Subject code:21-ZOO-602

Time:3HrsMax.Marks:75M

MODEL QUESTION PAPER

Section-A

(5X5=25)

Answer Any Five Questions, Each Question Carries Five Marks

Draw Diagrams Wherever Necessary.

- 1) Concept of Blue Revolution
- 2) Fresh water cultivable species
- 3) Raft culture
- 4) Intensive culture
- 5) Natural food for fish
- 6) Seed resources
- 7) Predators
- 8) Sea weeds

Section-B

(5 X 10=50)

Answer All questions , Each Question Carries Ten Marks.

Draw Diagrams Wherever Necessary.

- 9 (a) Define Aquaculture. Explain the significance and history of aquaculture
OR
(b) Write an account on major cultivable species for fresh water culture.
- 10 (a) Explain the management method to be adopted for composite culture of fish.
OR
(b) Explain in detail the fresh water, brackish water and marine aquatic resources available for aquaculture in India
- 11 (a) Explain the process of selection of site for freshwater and brackish water pond farms
OR
(b) Explain in detail the nutritional requirements of cultivable fish.
- 12 (a) Write an essay on stocking management of ponds.
OR
(b) Explain the culture of *Penaeus monodon*.
- 13 (a) Give brief account on ornamental fishes.
OR
(b) Write an essay on pearl oyster culture

PVKN GOVT. COLLEGE (A), CHITTOOR

III B. Sc- ZOOLOGY VIII-B1
PRINCIPLES OF AQUACULTURE
QUESTION BANK

1. Write about the status of fisheries in India.
2. Write about major cultivable species in brackish water.
3. Write about brackish water aquaculture.
4. Write about fresh water aquaculture.
5. Write the modified extensive, extensive semi extensive and intensive methods of culture in aquaculture.
6. Explain the criteria for selection of site for fresh water pond farms.
7. Write an essay on design and construction of fish form.
8. Write the major sources of shrimp seeds in India.
9. Describe the economic importance of sea weeds.
10. Define aquarium explain the different types of aquarium.
11. Write an essay on natural food and artificial feed in shrimp form.
12. Write an essay on liming in carp culture ponds.
13. Write an essay on culture of shrimp [penaeusmonodon].
14. Write brief about aquatic weeds in ponds culture and their control.
15. Write an essay on pre-stocking management of major carps.
16. Write briefly about dewatering.

SHORT ANSWER QUESTIONS

1. Define aquaculture	11. Pen culture
2. Significance of aquaculture	12. Intensive methods
3. Cultivable species	13. Pond culture
4. Monoculture	14. Culture methods
5. Stocking management	15. Shrimps
6. Liming materials	16. Ploughing
7. Predators	17. Drying
8. Aquatic weeds	18. Artificial feeds in fish farms
9. Site selection criteria	19. Natural resources
10. Cage culture	20. Composite culture



NEW

PVKN Govt. College(A), Chittoor

III B.Sc., SEMESTER –VI: ZOOLOGY PAPER – VIII – B-II

Aquaculture Management

Subject Code: 21-ZOO-603

Credits: 03

Teaching Hrs/Week: 4

Unit – I: Breeding and Hatchery Management

Bundh breeding and Induced breeding of carp by Hypophysation and use of synthetic hormones. Types of fish hatcheries and **Hatchery techniques**; Hatchery management of Indian major carps. Breeding and Hatchery management of Penaeus monodon/ Breeding and Hatchery management of giant freshwater prawn.

Unit – II: Water quality Management

Water quality and soil characteristics suitable for fish and shrimp culture. Identification of oxygen depletion problems and control mechanisms in culture ponds. Aeration: Principles of aeration and Emergency aeration. Liming materials, Organic manures and Inorganic fertilizers commonly used and their implications in fish ponds

Unit – III: Feed Management

Live Foods and their role in shrimp larval nutrition. Supplementary feeds: Principal foods in artificial diets; Types of feeds; Feed additives and Preservatives; role of probiotics. Feed formulation and manufacturing; Feed storage. **Nutrition and feed development strategies**

Unit – IV: Disease Management

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

Unit – V: Economics and Marketing

Principles of aquaculture economics – Capital costs, variable costs, cost-benefit analysis. Fish marketing methods in India; Basic concepts in demand and price analysis. **Fisheries Extension**. Fisheries Training and Education in India; Role of extension in community development. **Fish Genetics**: Genetic improvement of fish stocks – Hybridization of fish.



PVKN Govt. College(A), Chittoor
III B.Sc., SEMESTER – VI: ZOOLOGY :: PAPER – VIII- B-II

Subject Code: 22– ZOO -603

BLUE PRINT FOR THE MODEL PAPER

S. No.	Type of Question	To be given in the Question Paper			To be answered		
		No. of Questions	Marks allotted to each question	Total Marks	No. of Questions	Marks allotted to each question	Total Marks
1	Short Answers	8	5	40	5	5	25
2	Essays	10	10	100	5	10	50

BLUE PRINT FOR THE QUESTION PAPER SETTING

Chapter Name	Essay Question 10 Marks	Short Questions 5 Marks	Marks allotted to the Chapter
UNIT - I	2	2	30
UNIT - II	2	2	30
UNIT - III	2	2	30
UNIT - IV	2	1	25
UNIT - V	2	1	25
Total No. of Questions	10	10	140

PVKN Govt. College(A), Chittoor
III B.Sc., SEMESTER –VI: ZOOLOGY PAPER – VIII- B-II
AQUACULTURE MANAGEMENT

Subject Code: 21-ZOO-603

Time : 3hrs

Max Marks : 75

MODEL QUESTION PAPER

SECTION – A

Answer any Five of the following Questions

5X5 =25 Marks

1. A Question from UNIT-1
2. A Question from UNIT-1
3. A Question from UNIT-2
4. A Question from UNIT-2
5. A Question from UNIT-3
6. A Question from UNIT-3
7. A Question from UNIT-4
8. A Question from UNIT-5

SECTION – B

Answer ALL the following Questions

5X10 =50 Marks

9. A Question from UNIT-I

OR

10. A Question from UNIT-I

11. A Question from UNIT-II

OR

12. A Question from UNIT-II

13. A Question from UNIT-III

OR

14. A Question from UNIT-III

15. A Question from UNIT-IV

OR

16. A Question from UNIT-IV

17. A Question from UNIT-V

OR

18. A Question from UNIT-V

PVKN Govt. College(A), Chittoor
III B.Sc., SEMESTER – VI: ZOOLOGY - PAPER – VIII-B-2
Title of the Paper: AQUACULTURE MANAGEMENT

Subject Code: 22-ZOO-603

Credits: 03

Teaching Hrs/Week: 03

QUESTION BANK

1. Bundh breeding
2. Chinese hatchery
3. Water quality
4. Feed storage
5. Role of probiotics
6. Gill root disease
7. Principles of disease diagnosis
8. Principles of aquaculture economics
9. Soil characteristics
10. Principles of aeration
11. Types of feeds
12. Additives
13. Cost benefit analysis
14. Write an essay on induced breeding by hypophysation
15. Write the hatchery management of Indian major carps
16. Explain the soil characteristics suitable for shrimp culture
17. Explain the problems of oxygen depletion in culture ponds state its controlling measures
18. Explain briefly about the live food available to various stages of shrimp growing in hatchery habitats
19. The significance of supplementary feeding for the growth of culture fish
20. Write the principles of disease diagnosis in aquaculture organisms
21. Write an essay on common fish diseases in ponds and their symptoms and treatments
22. Write an essay on fish marketing methods in India
23. Write an essay on fisheries training and education in India
24. Write the hatchery management of *Penaeus monodon*[shrimp]
25. Write the different types of aerators used in culture ponds
26. Write an essay on feed formulation, manufacturing and feed storage
27. Write an essay on health management programmes in aquaculture
28. Write an essay on role of extension in community development of aquaculture

PVKN Govt. College(A), Chittoor
III B.Sc., SEMESTER –VI: ZOOLOGY PAPER-VIII-B-3
Cluster Elective Paper: VIII-B-3
POSTHARVEST TECHNOLOGY

Paper code:21-ZOO-604

Periods : 60

Max.Marks : 75

Unit – I

1.1 Handling and Principles of fish Preservation

1.1.1 Handling of fresh fish, storage and transport of fresh fish, post mortem changes (rigor mortis and spoilage), spoilage in marine fish and freshwater fish.

1.1.2 Principles of preservation– cleaning, lowering of temperature, rising of temperature, use of salt, use of fish preservatives, exposure to low radiation of gamma rays.

Unit – II

2.1 Methods of fish Preservation

2.1.1 Traditional methods - sun drying, salt curing, pickling and smoking.

2.1.2 Advanced methods – chilling or icing, refrigerated sea water, freezing, canning, Irradiation and Accelerated Freeze drying (AFD).

Unit – III

3.1 Processing and preservation of fish and fish by-products

3.1.1 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 . Fish food poisoning: **Histamine poisoning, Botulism, Shigella poisoning and Salmonella poisoning**

3.1.2 Fish by-products – fish glue, fish skin, chitosan, **pearl essence**, shark fins, fish leather and fish maws.

3.2 Seaweed Products

3.2.1 Preparation of agar, algin and carrageen. Use of seaweeds as food for human consumption, in disease treatment and preparation of therapeutic drugs.

Unit – IV

4.1 Sanitation and Quality control

4.2.1 Sanitation in processing plants - Environmental hygiene and Personal hygiene in processing plants.

4.2.2 Quality Control of fish and fishery products – pre-processing control, control during processing and control after processing

Unit – V

5.1 Quality Assurance, Management and Certification

5.1.1 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

PVKN Govt. College(A), Chittoor

III B.Sc., SEMESTER –VI: ZOOLOGY PAPER – VIII – BIII

Cluster Elective Paper: VIII-B-3**POSTHARVEST TECHNOLOGY**

Paper code:21-ZOO-604

BLUE PRINT FOR THE MODEL PAPER

S. No.	Type of Question	To be given in the Question Paper			To be answered		
		No. of Questions	Marks allotted to each question	Total Marks	No. of Questions	Marks allotted to each question	Total Marks
1	Short Answers	8	5	40	5	5	25
2	Essays	10	10	100	5	10	50

BLUE PRINT FOR THE QUESTION PAPER SETTING

Chapter Name	Essay Question 10 Marks	Short Questions 5 Marks	Marks allotted to the Chapter
UNIT - I	2	2	30
UNIT - II	2	2	30
UNIT - III	2	2	30
UNIT - IV	2	1	25
UNIT - V	2	1	25
Total No. of Questions	10	10	140



PVKN Govt. College(A), Chittoor

III B.Sc., SEMESTER –VI: ZOOLOGY PAPER – VIII – BIII

Cluster Elective Paper: VIII-B-3

POSTHARVEST TECHNOLOGY

Paper code:21-ZOO-604

Time :3hrs

Max Marks : 75

MODEL QUESTION PAPER

I ANSWER ANY FIVE OF THE FOLLOWING

5x5=25

1. Autolysis
2. Rigor mortis
3. canning
4. smoking.
5. Fish meal
6. Isin glass
7. Sanitation
8. Good Manufacturing Practices (GMPs)

PART – B

II ANSWER ANY FIVE OF THE FOLLOWING

9. A) Write an essay on transport methods of fresh fish.
(OR)
B) Explain about spoilage in marine and fresh water fishes.
10. A) Describe the traditional methods of fish preservation.
(OR)
B) Explain the methods of chilling and freezing.
11. A) Write an essay on preparation of agar and carrageen.
(OR)
B) Write an essay on fish by-products.
12. A) Explain about the quality control of fish and fishery products.
(OR)
B) Discuss the quality control of fish and fishery products
13. A) Write about the Standard Operating Procedures (SOPs) in food processing industry.
(OR)
B) Write notes on Hazard Analysis and Critical Control Points in sea food safety.

QUESTION BANK

(ESSAY QUESTIONS):- (10 Marks)

UNIT 1

1. Write a note on handling and storage of fresh fish.
2. Describe the transport methods of fresh fish.
3. Write an essay on principles of fish preservation.
4. Write an essay on spoilage mechanisms in marine and fresh water fishes.

UNIT II

1. Write an essay on traditional methods of fish preservation.
2. Write an essay on advanced methods of fish preservation.
3. Write an essay on Accelerated Freeze Drying (AFD) in fish preservation.

UNIT III

1. Write an essay on preparation of agar and carrageen.
2. Write an essay on fish by-products.
3. Write an essay on uses of sea weeds .

UNIT IV

1. Explain the Environmental hygiene in processing plants
2. Explain the Personal hygiene in processing plants.
3. Write a note on quality control in fish and fishery industries.

UNIT V

1. Describe the good manufacturing practices (GMP) in processing plants.
2. Describe the good laboratory practices (GLP) in processing plants.
3. Write about the Standard Operating Procedures (SOPs) in food processing industry.
4. Write notes on Hazard Analysis and Critical Control Points in sea food safety.

SHORT QUESTIONS:- (5 Marks)

1. Autolysis.
2. Rigor mortis.
3. canning.
4. smoking.
5. Fish meal.
6. Isin glass.
7. Sanitation.
8. Good Manufacturing Practices (GMPs).
9. use of fish preservatives.
10. sun drying.
11. salt curing.

12. freezing.
13. Agar.
14. Chitogen.
15. GLPs.
16. SOPs.
17. Chilling.
18. Fish oil.
19. Fish protein.
20. fish minced meat.
21. Fish glue.
22. fish liquid (ensilage).