

**SRR & CVR GOVERNMENT DEGREE COLLEGE
(AUTONOMOUS)**

MACHAVARAM, VIJAYAWADA-520004

DEPARTMENT OF ZOOLOGY



**MINUTES OF
UP GRADATION OF SYLLABUS MEETING
(2019-20)**

DATED : 21/02/2019

Courses: B.Sc., B.Z.C & AT.Z.C

ZOOLOGY & AQUACULTURE TECHNOLOGY

SEMESTER-V

SYLLABUS, BLUE PRINT & MODEL QUESTION PAPERS

(AS PER CBCS AND SEMESTER SYSTEM)

(W.E.F.2017-18)



SRR & CVR GOVT. DEGREE COLLEGE

(Autonomous)

NAAC accredited with 'B+' Grade

Machavaram, Vijayawada – 520 004, Krishna District.

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Dr. Velaga Joshi, Principal

M.A. (Phil.), M.A. (His), M.A. (M.C.J.), B.L., M.Phil., Ph.D.

MINUTES OF THE MEETING ON UP GRADATION OF SYLLABUS IN DEPARTMENT OF ZOOLOGY

The meeting on Up gradation of syllabus in the subject of **ZOOLOGY** was held on **21st February 2019** in Room No: **Zoology Department**, for Vth Semester of III. B.Sc (BZC) and III. B.Sc (AT.Z.C) syllabus under the chairmanship of Dr. M.Vijaya Kumar, Lecturer Incharge, Department of Zoology Department. **The following members attended the meeting:**

- 1. Dr. M.VIJAYA KUMAR** (Chairman)
Lecturer in Zoology
SRR & CVR GDC (A) Vijayawada
- 2. Dr.K.VEERAI AH** (University Nominee)
Professor
Department of Zoology & Aquaculture
Acharya Nagarjuna University.
Guntur.AP
- 3. Dr.CH.TULASI MASTANAMMA** (Subject Expert)
Associate Professor
Department of Zoology
Govt. Degree College for Women (A)
Guntur
- 4. Dr.N.SREENIVAS** (Subject Expert)
Associate Professor
Department of Zoology
PR Govt.(A) College
Kakinada.AP
- 5. Sri.RAGHURAM REDDY** (Special Member)
Neelagri Foundation
Atmakur, Guntur
- 6. G.VANI** (Faculty Member)
Lecturer in Zoology
SRR & CVR GDC (A), Vijayawada
- 7. K. DURGA RAO** (Faculty Member)
Lecturer in Zoology
SRR & CVR GDC (A), Vijayawada
- 8. Sk.Parveen** (Faculty Member)
Lecturer in Zoology
SRR & CVR GDC (A), Vijayawada



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Dr. Velaga Joshi, Principal
M.A.(Phd), M.A.(Dist), M.A. (D.C.), B.L., M.Phil., Ph.D.

MINUTES OF THE MEETING ON UP GRADATION OF SYLLABUS IN DEPARTMENT OF ZOOLOGY

The meeting on Up gradation of syllabus in the subject of ZOOLOGY was held on 21st February 2019 in Room No: Zoology Department, for Vth Semester of III. B.Sc (BZC) and III. B.Sc (AT.Z.C) syllabus under the chairmanship of Dr. M.Vijaya Kumar, Lecturer Incharge, Department of Zoology Department. The following members attended the meeting:

1. **Dr. M.VIJAYA KUMAR** (Chairman) *M.Vijaya Kumar*
Lecturer in Zoology
SRR & CVR GDC (A) Vijayawada
2. **Dr.K.VEERAAIAH** (University Nominee) *K. Veeraiyah 21/02/2019*
Professor
Department of Zoology & Aquaculture
Acharya Nagarjuna University,
Guntur.AP
3. **Dr.CH.TULASI MASTANAMMA** (Subject Expert) *Tulasi*
Associate Professor
Department of Zoology
Govt. Degree College for Women (A)
Guntur
4. **Dr.N.SREENIVAS** (Subject Expert) *N. Sreenivas 21/2/2019*
Associate Professor
Department of Zoology
PR Govt.(A) College
Kakinada.AP
5. **Sri.RAGHURAM REDDY** (Special Member) *A. Raghuram Reddy*
Neelagri Foundation
Atmakur, Guntur
6. **G.VANI** (Faculty Member) *G. Vani*
Lecturer in Zoology
SRR & CVR GDC (A), Vijayawada
7. **K. DURGA RAO** (Faculty Member) *K. Durga Rao*
Lecturer in Zoology
SRR & CVR GDC (A), Vijayawada
8. **Sk.Parveen** (Faculty Member) *Sk. Parveen*
Lecturer in Zoology
SRR & CVR GDC (A), Vijayawada

AGENDA

- Approval of syllabus for Semester V for the academic year 2019-20.
- To approve the Question papers blue print and model papers
- To approve validity of this syllabus for next three years.
- To divide 100 marks into internal 40 marks and external 60 marks for theory.
- The pass mark is 40% i.e., 24 out of 60 for External and 16 out of 40 for Internal.
- To divide 50 marks into internal 25 marks and external 25 marks for Practical's.
- The pass mark is 40% i.e., 10 out of 25 for External and Internal.
- To evaluate internal assessment, Assignment/Viva/Assessment /Seminar/Project /Field note/Two mid examinations.
- To approve the list of paper setters and examiners
- To approve other academic activities of the department
- For approval of any other matter with the permission of the Chairperson.

The Chairperson welcomed the members and initiated discussion on the syllabus for V semesters. He apprised the members about the guidelines of the UGC and the CCE regarding the framing of syllabus and the recommended evaluation ratio for internal and external examinations. The members discussed in detail the various aspects presented before them and unanimously resolved the following:

RESOLUTIONS

1. Resolved to adopt the present University CBCS syllabus for semester V with suggested modifications, and adopt the same syllabus for Aquaculture Technology as proposed by APSCHE.
2. Resolved to approve the division of marks for internal and external examination along with the suggested blue print and model paper.
3. Resolved to divide 100 marks into internal 40 marks and external 60 marks for theory. and the pass mark is 40% i.e., 24 out of 60 for External and 16 out of 40 for Internal.
4. Resolved to divide 50 marks into internal 25 marks and external 25 marks for Practical's. and the pass mark is 40% i.e., 10 out of 25 for External and Internal.
5. Resolved to use Virtual class room, ICT, Computer/Internet assisted learning for students regularly for teaching learning process.
6. Resolved to conduct student centric activities like Quiz, Group discussion etc
7. Resolved to arrange Field trips Surveys, Society outreach programmes etc.
8. Resolved to continue the certificate course in vermincompost approved in 2017-18
9. Resolved to conduct Guest Lectures, Student Seminars, Study Projects etc
10. Resolved to use Learning Management System LMS
11. Resolved to approve the list of paper setters and examiners submitted by the department.
12. Resolved to include two Additional Inputs-
 - a. Prebiotics and Probiotics in Paper V-Animal Biotechnology
 - b. Piggery in Paper VI- Animal Husbandry.
13. Further the committee resolved to give empowerment for any small changes to the Chairman in up gradation of the syllabus.

SRR & CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA.

**III B.Sc BZC & ATZC
ZOOLOGY SYLLABUS**

SEMESTER-V

PAPER – V

ANIMAL BIOTECHNOLOGY

Periods: 60

Max. 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. Terminal deoxynucleotidyl transferase, kinases and phosphatases, and DNA ligases

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 viral-mediated delivery

PCR: Basics of PCR.

DNA Sequencing: Sanger's method of DNA sequencing- traditional and automated sequencing

Hybridization techniques: Southern, Northern and Western blotting,

Genomic and cDNA libraries: Preparation and uses

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

Unit 4 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; applications

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 – monoculture in fishes, polyploidy in fishes; DNA fingerprinting

Additional Input: Prebiotics and Probiotics

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III B.Sc BZC & ATZC

ZOOLOGY PRACTICAL SYLLABUS

SEMESTER-V

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.

REFERENCE BOOKS

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)

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III B.Sc BZC & ATZC

ZOOLOGY THEORY

INTERNAL MARKS ALLOTMENT

SEMESTER-V

PAPER- V

ANIMAL BIOTECHNOLOGY

Zoology Theory- Internal

Total Marks: 40

1. Internals (2)	:	10 marks
2. Assignments (2)	:	5x2=10 marks
3. Project	:	10 marks
4. Seminar	:	5 marks
5. Attendance	:	5 marks

SRR & CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA.

III B.Sc BZC & ATZC

ZOOLOGY THEORY

EXTERNAL MARKS ALLOTMENT

SEMESTER-V

PAPER – V

ANIMAL BIOTECHNOLOGY

Zoology Theory- External

Total Marks: 60

Section –A

I.	Short Answer questions (Any 5 from given 10) 1 to 10	5x4=20
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Section –B

II.	Essay Questions (With internal choice) 11 to 15	5x8=40
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III B.Sc BZC & ATZC

ZOOLOGY

PRACTICAL MARKS ALLOTMENT

SEMESTER-V

PAPER – V

ANIMAL BIOTECHNOLOGY

Zoology Practical's - External

Time: 3 hrs.

Total Marks: 25

- | | | |
|--------------------|---|---------|
| 1.Major experiment | : | 8 marks |
| 2.Minor experiment | : | 6 marks |
| 3.Identification | : | 6 marks |
| 4.Viva voce | : | 5 marks |

Zoology Practical's - Internal

Total Marks: 25

- | | | |
|-------------------|---|----------|
| 1.Assessment | : | 10 marks |
| 2.Record | : | 10 marks |
| 3.Field note book | : | 5 marks |

Question Paper Blue Print

SRR&CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA.

**III B.Sc BZC & ATZC
ZOOLOGY THEORY**

SEMESTER-V

PAPER – V

ANIMAL BIOTECHNOLOGY

BLUE PRINT MODEL FOR EXTERNAL EXAMINATIONS

	Section A			Section B		
	Short Questions			Essay Questions		
	NO OF QUESTIONS	MARKS ALLOTTED FOR EACH QUESTION	TOTAL MARKS	NO OF QUESTIONS	MARKS ALLOTTED FOR EACH QUESTION	TOTAL MARKS
UNIT -I	02	4	8	02	8	16
UNIT-II	02	4	8	02	8	16
UNIT-III	02	4	8	02	8	16
UNIT-IV	02	4	8	02	8	16
UNIT-V	02	4	8	02	8	16

Section-A: Questions numbers 1 to 10,

Out of 10 Questions 5 has to be answered.

Section-B: Questions numbers 11 to 15,

Internal Choice (either / or) and 5 Questions has to be answered.

1. Short Questions : 5 x 4 = 20
2. Essay Questions : 5 x 8 = 40

Total : 60 Marks

Model Question Paper

SRR&CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA.

III B.Sc BZC & ATZC

ZOOLOGY

SEMESTER-V

PAPER – V

ANIMAL BIOTECHNOLOGY

Time: 2½hrs

Max Marks: 60

SECTION-A

I. Answer any FIVE of the following

Draw labeled diagram wherever necessary

5x4=20

1. DNA polymerases. DNA పాలిమరేజస్
2. Cosmids కస్మిడ్స్
3. Electrophoration. ఎలక్ట్రోఫోరేషన్
4. PCR PCR పాలిమరేజ్ చైన్ రియాక్షన్
5. Organ culture. అంగవర్ధనము
6. Cryopreservation క్రైయోప్రిజర్వేషన్
7. Super ovulation. సూపర్ అండోత్సర్గము
8. Embryo Cloning ఎంబ్రియో క్లోనింగ్
9. Centrifugation సెంట్రీఫ్యూగేషన్
10. DNA finger printing. DNA ఫింగర్ ప్రింటింగ్

SECTION-B

II. Answer any FIVE of the following

Draw labeled diagram wherever necessary

5x8=40

11. (a) Explain different types of restriction enzymes used in genetic engineering.
జన్యు సాంకేతికశాస్త్రముల నందు ఉపయోగపడు వివిధ రకాల రిస్ట్రిక్షన్ ఎంజైమ్లను వివరించండి.

Or

- (b) Write an essay on cloning vectors.
క్లోనింగ్ వెక్టార్లపై ఒక వ్యాసాన్ని రాయండి.

12. (a) Explain the preparation of genomic and c-DNA libraries.

జీనోమిక్ లైబ్రరీ మరియు సి-డిఎన్ఎ లైబ్రరీ తయారీ విధానమును వివరించండి

Or

- (b) Write an essay on Sanger's methods of DNA sequencing.

సాంగర్ విధానం ద్వారా DNA సీక్వెన్సింగ్ తయారుగావించు పద్ధతిని గూర్చి ఒక వ్యాసం రాయండి.

13.(a) Give an account on production of MAb's and it's applications.

MAB యొక్క ఉత్పత్తి మరియు ఉపయోగాలు వివరించండి

Or

(b) Describe the different types of Stemcells and it's applications.

వివిధ రకాలైన మూలకణాలను మరియు వాటి ఉపయోగాలు వివరించండి

14. (a) What do you understand by (IVF) Invitro Fertilization. How it is done?

IVF అనగానేమి ? IVF జరుగు పద్ధతిని వివరింపుము?

Or

(b) What is transgenesis and explain it's application in animals?

ట్రాన్స్ జెనెసిస్ అంటే ఏమిటి? వాటి వలనకలుగు ప్రయోజనలు వివరింపుము

15. (a) Explain the steps involved in down stream processing of fermentation.

డౌన్ స్ట్రీమ్ పద్ధతిలో కిణ్ణ ప్రక్రియ విధానమును వివరించండి

Or

(b) Explain monoculture and polypoidy in fishes.

చేపలలో మొనోకల్చర్ మరియు పాలిప్లాయిడిని వివరించండి.

SRR&CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA.
III B.Sc BZC & ATZC
ZOOLOGY SYLLABUS
SEMESTER-V
PAPER – VI
ANIMALHUSBANDRY

Periods:60

Max. Marks: 100

UNIT – I :

General introduction to poultry farming. Principles of poultry housing. Poultry houses. Systems of poultry farming. Management of chicks, growers and layers. Management of Broilers.

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 – 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:

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

Additional input : Piggery

SRR&CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA.
III B.Sc BZC & ATZC
ZOOLOGY PRACTICAL SYLLABUS
SEMESTER-V
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.

REFERENCE BOOKS

1. TEXTBOOK OF ANIMAL HUSBANDRY by BANERJEE, G.C. Publisher oxford
2. Book on Animal Husbandry Gyan Deep Singh Publisher : Anmol Publishers
3. Paadiparisrama Ch. Ramesh Saritha Veterinary book publishers-Hyderabad, Vijayawada
4. Pasugana yagamanyam Dr. A. Venkata, Ramaiah Rithu nestham Publications
5. Animal Husbandry by Venkateswara Publications, Guntur
6. Kollaprisrama-Telugu Academy.

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III B.Sc BZC & ATZC

ZOOLOGY THEORY

INTERNAL MARKS ALLOTMENT

SEMESTER-V

PAPER – VI

ANIMAL HUSBANDRY

Zoology Theory- Internal

Total Marks: 40

1. Internals (2)	:	10 marks
2. Assignments (2)	:	5x2=10 marks
3. Project	:	10 marks
4. Seminar	:	5 marks
5. Attendance	:	5 marks

SRR & CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA.

III B.Sc BZC & ATZC

ZOOLOGY THEORY

EXTERNAL MARKS ALLOTMENT

SEMESTER-V

PAPER – VI

ANIMAL HUSBANDRY

Zoology Theory- External

Total Marks: 60

Section –A

I. Short Answer questions (Any 5 from given 10) 1 to 10		5x4=20
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Section –B

II. Essay Questions (With internal choice) 11 to 15		5x8=40
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SRR&CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA.

III B.Sc BZC & ATZC

ZOOLOGY

PRACTICAL MARKS ALLOTMENT

SEMESTER-V

PAPER – VI

ANIMAL HUSBANDRY

Zoology Practical's - External

Time: 3 hrs.

Total Marks : 25

- | | | |
|------------------|---|---------|
| 1.Major | : | 8 marks |
| 2.Minor | : | 6 marks |
| 3.Identification | : | 6 marks |
| 4. Viva voce | : | 5 marks |

Zoology Practical's - Internal

Total Marks: 25

- | | | |
|-------------------|---|----------|
| 1.Assessment | : | 10 marks |
| 2.Record | : | 10 marks |
| 3.Field note book | : | 5 marks |

Question Paper Blue Print

SRR & CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA.

III B.Sc BZC & ATZC

ZOOLOGY THEORY

SEMESTER-V

PAPER – VI

ANIMAL HUSBANDRY

BLUE PRINT MODEL FOR EXTERNAL EXAMINATIONS

	Section A			Section B		
	Short Questions			Essay Questions		
	NO OF QUESTIONS	MARKS ALLOTTED	TOTAL MARKS	NO OF QUESTIONS	MARKS ALLOTTED	TOTAL MARKS
UNIT -I	02	4	8	02	8	16
UNIT-II	02	4	8	02	8	16
UNIT-III	02	4	8	02	8	16
UNIT-IV	02	4	8	02	8	16
UNIT-V	02	4	8	02	8	16

Section-A: Questions numbers 1 to 10,

Out of 10 Questions 5 has to be answered.

Section-B: Questions numbers 11 to 15,

Internal Choice (either / or) and 5 Questions has to be answered.

1. Short Questions : $5 \times 4 = 20$
2. Essay Questions : $5 \times 8 = 40$

Total : 60 Marks

Model Question Paper

SRR&CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA.
III B.Sc BZC AQUACULTURE TECHNOLOGY
SEMESTER-V
PAPER – VI
ANIMAL HUSBANDRY

Time: 2½ hrs

Max Marks: 60

SECTION-A

I. Answer any FIVE of the following
Draw labeled diagram wherever necessary

5x4=20

1. Deep litter system డీప్ లిట్టర్ వ్యవస్థ
2. Management of layers గుడ్లపెట్టు కోళ్ళ యాజమాన్య పద్ధతులు
3. Poultry Feed management కోళ్ళ దాణా యాజమాన్యం
4. Marek's disease మెరెక్స్ వ్యాధి
5. Candle test కొవ్వొత్తి పరీక్ష
6. Methods of Hatching హాచింగ్ పద్ధతులు
7. Cleaning and Sanitation of Dairy Farms పాడి పరిశ్రమల శుభ్రత మరియు శానిటేషన్
8. Vaccination programme టీకా కార్యక్రమం
9. Care and management of milk animals పాలిచ్చు పశువుల సంరక్షణ మరియు నిర్వహణ
10. Care and Management of Bulls and Bullocks కోడెలు మరియు దున్నపోతుల సంరక్షణ మరియు నిర్వహణ

SECTION-B

II. Answer any FIVE of the following
Draw labeled diagram wherever necessary

5x8=40

11. a. Explain the different types of sheds in Poultry
పౌల్ట్రీలో వివిధ రకాల షెడ్లను వివరించండి
(or)
b. Describe different methods of management of chicks
కోడిపిల్లల నిర్వహణ యొక్క వివిధ పద్ధతులను వివరించండి
12. a. Describe Nutrient requirement for Layers and Broilers
బ్రాయిలర్స్ మరియు లేయర్స్ యొక్క పోషక అవసరాలును వివరించండి
(or)
b. Write an essay on symptoms, control and management of any two viral and two bacterial diseases.
కోళ్ళలో వచ్చు రెండు వైరల్ మరియు రెండు బాక్టీరియా వ్యాధుల లక్షణాలు, నియంత్రణ మరియు నిర్వహణపై ఒక వ్యాసం రాయండి

13 a. Write an essay on different methods of hatching of eggs
గుడ్డును పొదిగించే వివిధ పద్ధతులను వ్రాయండి

(or)

b. Write an essay on sexing of chicks
కోడిపిల్లలలో లింగ నిర్ధారణ పద్ధతులపై వ్యాసం రాయండి

14.a. What is animal breeding and explain methods of animal breeding
జంతు ప్రజననం అనగానేమి ? జంతు ప్రజనన పద్ధతుల గూర్చి వివరించడం

(or)

b. Describe housing of dairy animals
పాడి పశువుల గృహ నిర్మాణంను వివరించండి

12. a. Write an essay on care and management of calf and Heifers
లొగదూడలు మరియు దూడల యొక్క సంరక్షణ మరియు నిర్వహణపై ఒక వ్యాసం రాయండి,

(or)

b. Write an essay on management of pregnant animals.
గర్భం ధరించిన పశువులు నిర్వహణపై ఒక వ్యాసం రాయండి.

**SRR & CVR GOVERNMENT DEGREE COLLEGE
(AUTONOMOUS)
VIJAYAWADA**



**DEPARTMENT OF ZOOLOGY
(2019-20)**

**NEW COURSE- AQUACULTURE TECHNOLOGY
(AS PER APSCHE w.e.f 2017-18)**

B.Sc., (AT.Z.C)

SEMESTER-V

Syllabus, Blue Print and Model question papers

SRR & CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA.
AQUACULTURE TECHNOLOGY SYLLABUS
SEMESTER-V
PAPER – V
FISH HEALTH MANGEMENT

UNIT I: PATHOLOGY AND PARASITOLOGY

- 1-1 Introduction to fish diseases –Definition and categories of diseases – Disease and environment
- 1-2 Disturbance in cell structure – changes in cell metabolism, progressive and retrogressive tissue changes, types of degeneration, infiltration, necrosis, cell death and causes
- 1-3 Atrophy, hypertrophy, neoplasms, inflammation, healing and repair

UNIT II: DISEASES OF FIN FISH

- 2-1 Fungal diseases (both of shell and finfish) – Saprolegniosis, brachiomycosis, ichthyophorus diseases – Lagenidium diseases – Fusarium disease, prevention and therapy
- 2-2 Viral diseases – Emerging viral diseases in fish, haemorrhagic septicemia, spring viremia of carps, infectious hematopoietic necrosis in trout, infectious pancreatic necrosis in salmonids, swim-bladder inflammation in cyprinids, channel cat fish viral disease, prevention and therapy
- 2-3 Baterial diseases – Emerging bacterial diseases, aeromonas, pseudomonas and vibrio infections, columnaris, furunculosis, epizootic ulcerative syndrome, infectious abdominal dropsy, bacterial gill disease, enteric red mouth, bacterial kidney disease, proliferative kidney disease, prevention and therapy

UNIT III: DISEASES OF SHELL FISH

- 3-1 Major shrimp viral diseases – Baculovirus penaeii, Monodon Baculovirus, Baculoviral midgut necrosis, Infectious hypodermal and haematopoietic necrosis virus, Hepatopancreatic parvo like virus, Yellow head baculovirus, white spot baculovirus.
- 3-2 Bacterial diseases of shell fish – aeromonas, pseudomonas and vibrio infections, luminous bacterial disease, filamentous bacterial disease. Prevention and therapy
- 3-3 Protozoan diseases- Ichthyophthiriasis, Costiasis, whirling disea/ses, trypanosomiasis. Prevention and therapy

UNIT IV: NUTRITIONAL DISEASES

- 4-1 Nutritional pathology – lipid liver degeneration, Vitamin and mineral deficiency diseases. Aflatoxin and dinoflagellates.
- 4-2 Antibiotic and chemotherapeutics. Nutritional cataract. Genetically and environmentally induced diseases.

UNIT V: FISH HEALTH MANAGEMENT

- 5-1 Diagnostic tools – immune detection- DNA/RNA techniques, General preventive methods and prophylaxis. Application and development of vaccines.
- 5-2 Quarantine – Significance, methods and regulations for transplants.
- 5-3 Production of disease-free seeds. Evaluation criteria of healthy seeds.
- 5-4 Good Feed management for healthy organisms, Zero water exchange, Probiotics in health management, Issues of biosecurity.

SRR & CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA.
AQUACULTURE TECHNOLOGY PRACTICAL SYLLABUS
SEMESTER-V
PAPER – V
FISH HEALTH MANGEMENT

Periods: 24

Max. Marks: 50

1. Enumeration of Bacteria by TPC Method
2. Enumeration of total Coliforms
3. Observation of gross pathology and external lesions of fish and prawn with reference to the common diseases in aquaculture
4. Examination of pathological changes in gills and gut lumen, lymphoid organ, muscles and nerves of fish
5. Examination of pathological changes in gut lumen, hepatopncreas, lymphoid organ, muscles and nerves of prawn and shrimp
6. Collection, processing and analysis of data for epedemeiological investigations of viral diseases
7. Bacterial pathogens – isolation, culture and characterization
8. Identification of parasites in fishes: Protozoan, Helmiths, Crustaceans
9. Antibiograms – preparation and evaluation
10. Molecular and immunological techniques; Biochemical tests; PCR; ELISA; Agglutination test; Challenge tests; Purification of virus for development of vaccines (Demonstration at institutes/labs)
11. Estimation of dose, calculation of concentration, methods of administration of various chemotherapeutics to fish and shell fish
12. Estimation of antibiotics used in aquaculture practices
13. Estimation of probiotics used in aquaculture
14. Field visit to farm for health monitoring and disease diagnosis

PRESCRIBED BOOK(S):

1. Shaperclaus W. 1991 Fish Diseases- Vol.I & II. Oxonian Press Pvt.ltd
2. Roberts RJ 1989. Fish pathology. Bailliere Tindall, New York
3. Lydia Brown 1993. Aquaculture for veterinarians- fish husbandray and medicine. Pergamon Press. Oxford

REFERENCES:

1. Shankar KM & Mohan CV. 2002. Fish and Shellfish Health Management. UNESCO Publ. Sindermann CJ. 1990
2. Walker P & Subasinghe RP. (Eds.). 2005 Principal Diseases of Marine Fish and Shellfish. Vols. I, II. 2nd Ed. Academic Press
3. DNA Based Molecular Diagnostic Techniques: Research Needs for Standardization and Validation of the Detection of Aquatic Animal Pathogens and Diseases. FAO Publ. Wedmeyer G, Meyer FP & Smith L. 1999.
4. Bullock G et.al., 1972 Bacterial diseases of fishes. TFH publications, New Jersey
5. Post G 1987. Text book of Fish Health. TFH publications, New Jersey
6. Johnson SK 1995. Handbook of shrimp diseases. Texas A & M University, Texas

SRR & CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA.
III B.Sc (AT.Z.C) AQUACULTURE TECHNOLOGY THEORY
INTERNAL MARKS ALLOTMENT

SEMESTER-V

PAPER – V

FISH HEALTH MANGEMENT

Theory- Internal

Total Marks: 40

1. Internals (2)	:	10 marks
2. Assignments (2)	:	10 marks
3. Project	:	10 marks
4. Seminar	:	5 marks
5. Attendance	:	5 marks

SRR & CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA.
III B.Sc (AT.Z.C) AQUACULTURE TECHNOLOGY THEORY
EXTERNAL MARKS ALLOTMENT

SEMESTER-V

PAPER – V

FISH HEALTH MANGEMENT

Theory- External

Total Marks: 60

Section –A

I. Short Answer questions (Any 5 from given 10) 1 to 10	5x4=20
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Section –B

II. Essay Questions (With internal choice) 11 to 15	5x8=40
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SRR & CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA.

III B.Sc (AT.Z.C) AQUACULTURE TECHNOLOGY

PRACTICAL MARKS ALLOTMENT

SEMESTER-V

PAPER – V

FISH HEALTH MANGEMENT

Practical's - External

Time: 3 hrs.

Total Marks: 25

- | | | |
|---------------------|---|---------|
| 1. Major experiment | : | 8 marks |
| 2. Minor experiment | : | 6 marks |
| 3. Identification | : | 6 marks |
| 4. Viva voce | : | 5 marks |

Practical's – Internal

Total Marks: 25

- | | | |
|--------------------|---|----------|
| 1. Assessment | : | 10 marks |
| 2. Record | : | 10 marks |
| 3. Field note book | : | 5 marks |

Question Paper Blue Print

SRR&CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA.
III B.Sc (AT.Z.C) AQUACULTURE TECHNOLOGY
SEMESTER-V
PAPER – V
FISH HEALTH MANGEMENT
BLUE PRINT MODEL FOR EXTERNAL EXAMINATIONS

	Section A			Section B		
	Short Questions			Essay Questions		
	NO OF QUESTIONS	MARKS ALLOTTED FOR EACH QUESTION	TOTAL MARKS	NO OF QUESTIONS	MARKS ALLOTTED FOR EACH QUESTION	TOTAL MARKS
UNIT - I	02	4	8	02	8	16
UNIT-II	02	4	8	02	8	16
UNIT-III	02	4	8	02	8	16
UNIT-IV	02	4	8	02	8	16
UNIT-V	02	4	8	02	8	16

Section-A: Questions numbers 1 to 10,

Out of 10 Questions 5 has to be answered.

Section-B: Questions numbers 11 to 15,

Internal Choice (either / or) and 5 Questions has to be answered.

1. Short Questions : 5 x 4 = 20
2. Essay Questions : 5 x 8 = 40

Total : 60 Marks

Model Question Paper

SRR&CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA.
III B.Sc (AT.Z.C) AQUACULTURE TECHNOLOGY
SEMESTER-V
PAPER – V
FISH HEALTH MANAGEMENT

Time: 3 hrs

Max Marks: 60

SECTION-A

I. Answer any FIVE of the following

Draw labeled diagram wherever necessary

5x4=20

1. Necrosis
2. Inflammation
3. Aeromonas in Fin fish
4. Fusarium in Fin fish
5. Costiasis in shell fish
6. Yellow head baculovirus in shell fish
7. Aflatoxin
8. Zero water exchange
9. Mineral deficiency
10. Probiotics

SECTION-B

II. Answer any FIVE of the following

Draw labeled diagram wherever necessary

5x8=40

11. a. Explain progressive and retrogressive tissue changes in fish.
(or)
b. Describe cell death and causes in fish
12. a. Explain any three fungal diseases in fin fish with preventive and therapeutic measures.
(or)
b. Describe spring viremia of carps and infectious pancreatic necrosis in Salmonids.
13. a. Explain any three viral diseases in shell fish.
(or)
b. Explain preventive and therapeutic measures of protozoan diseases in shell fish.
14. a. Describe vitamin deficiency diseases in Fin fish.
(or)
b. Explain genetically induced diseases in Fin fish
15. a. Describe immune detection techniques used in shell fish
(or)
b. Write an account on Probiotics in health management of shell fish.

SRR&CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA.
AQUACULTURE TECHNOLOGY SYLLABUS
SEMESTER-V
PAPER – VI
FISHERIES EXTENSION, ECONOMICS & MARKETING

Periods: 60

Max. marks: 100

UNIT – 1 INTRODUCTION

- 1-1 Meaning and scope of economics with reference to fisheries
- 1-2 Basic concepts of economics – goods, services, wants and utility, demand and supply, value price, market demand and individual demand, elasticity of demand, law of diminishing marginal utility
- 1-3 Theory of production, production function in fisheries
- 1-4 Various factors influencing the fishery product's price

UNIT – II FISHERIES MARKETING

- 2-1 Basic marketing functions, consumer behaviour and demand, fishery market survey and test marketing a product
- 2-2 Fish marketing – prices and price determination of fishes
- 2-3 Marketing institutions- primary(producer fishermen, fishermen cooperatives, and fisheries corporations) and secondary (merchant/agent/speculative middlemen)
- 2-4 Methods of economic analysis of business organizations
- 2-5 Preparation of project and project appraisal

UNIT-III FISHERIES CONOMICS

- 3-1 Aquaculture economics- application of economics principles to aquaculture operations
- 3-2 Various inputs and production function. Assumptions of production function in aquaculture analysis, least cost combination of inputs, laws of variable proportions
- 3-3 Cost and earnings of aquaculture systems – carp culture, shrimp farming systems, hatcheries, Cost and earnings of fishing units and freezing plants
- 3-4 Socio-economic conditions of fishermen in Andhra Pradesh, Role of Matsyafed and NABARD in uplifting fishermen's conditions, fishermen cooperatives
- 3-5 Contribution of fisheries to the national economy

UNIT-IV FISHERIES EXTENSION

- 4-1 Fisheries extension – scope and objectives, principles and features of fisheries extension education
 - 4-1.1 Fisheries extension methods and rural development
- 4-3 Adoption and diffusion of innovations

UNIT-V TRANSFER OF TECHNOLOGY

- 5-1 ICAR programs – salient features of ORP, NDS, LLP, IRDP, ITDA, KVK, FFDA, FCS, FTI, TRYSEM
- 5-2 Training – meaning, training vs. education and teaching
- 5-3 DAATT centres and their role in tot programs, video conferencing, education of farmers through print and electronic media

**SRR & CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA.
AQUACULTURE TECHNOLOGY PRACTICAL SYLLABUS
SEMESTER-V
PAPER – VI
FISHERIES EXTENSION, ECONOMICS & MARKETING**

Periods: 24

Max. Marks: 50

Project work/on-job training at industry

PRESCRIBED BOOK(S):

1. Adivi Reddy sv 1997. An introduction to extension education. Oxford & IBH Co.Pvt. Ltd. New Delhi
2. Jayaraman R 1996. Fisheries Economics. Tamilnadu Veterinary and Animal Science University. Tuticorn
3. Subba Rao N 1986. Economics of Fisheries. Daya publishing house, Delhi

REFERENCES:

1. Dewwett KK and Varma JD 1993. Elementary economic theory. S.chand, New Delhi
2. Korakandy R 1996. Economics of Fisheries Mangement. Daya Publishing House, Delhi
3. Tripathi SD 1992. Aquaculture Economics. Asian Fisheries Society, Mangalore.

SRR & CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA.
III B.Sc (AT.Z.C) AQUACULTURE TECHNOLOGY THEORY
INTERNAL MARKS ALLOTMENT

SEMESTER-V

PAPER – VI

FISHERIES EXTENSION, ECONOMICS & MARKETING

<u>Theory- Internal</u>	Total Marks: 40
1. Internals (2)	: 10 marks
2. Assignments (2)	: 10 marks
3. Project	: 10 marks
4. Seminar	: 5 marks
5. Attendance	: 5 marks

SRR & CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA.
III B.Sc (AT.Z.C) AQUACULTURE TECHNOLOGY THEORY
EXTERNAL MARKS ALLOTMENT

SEMESTER-V

PAPER – V

FISHERIES EXTENSION, ECONOMICS & MARKETING

<u>Theory- External</u>	Total Marks: 60
Section –A	
I. Short Answer questions (Any 5 from given 10) 1 to 10	5x4=20
Section –B	
II. Essay Questions (With internal choice) 11 to 15	5x8=40

SRR&CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA.
III B.Sc (AT.Z.C) AQUACULTURE TECHNOLOGY
PRACTICAL MARKS ALLOTMENT
SEMESTER-V
PAPER – VI
FISHERIES EXTENSION, ECONOMICS & MARKETING

Practical's - External

Total Marks : 25

Project work/on-job training at industry-

Practical's - Internal

Total Marks: 25

1 .Assessment	:	10 marks
2.Record	:	10 marks
3.Vivo Voce	:	5 marks

Question Paper Blue Print

SRR & CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA.

III B.Sc (AT.Z.C) AQUACULTURE TECHNOLOGY THEORY

SEMESTER-V

PAPER – V

FISHERIES EXTENSION, ECONOMICS & MARKETING

BLUE PRINT MODEL FOR EXTERNAL EXAMINATIONS

	Section A			Section B		
	Short Questions			Essay Questions		
	NO OF QUESTIONS	MARKS ALLOTTED	TOTAL MARKS	NO OF QUESTIONS	MARKS ALLOTTED	TOTAL MARKS
UNIT -I	02	4	8	02	8	16
UNIT-II	02	4	8	02	8	16
UNIT-III	02	4	8	02	8	16
UNIT-IV	02	4	8	02	8	16
UNIT-V	02	4	8	02	8	16

Section-A: Questions numbers 1 to 10,

Out of 10 Questions 5 has to be answered.

Section-B: Questions numbers 11 to 15,

Internal Choice (either / or) and 5 Questions has to be answered.

1. Short Questions : $5 \times 4 = 20$
2. Essay Questions : $5 \times 8 = 40$

Total : 60 Marks

Model Question Paper

**SRR&CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA.
III B.Sc (AT.Z.C) AQUACULTURE TECHNOLOGY
SEMESTER-V
PAPER – VI
FISHERIES EXTENSION, ECONOMICS AND MARKETING**

Time: 3 hrs

Max Marks: 60

SECTION-A

**I. Answer any FIVE of the following
Draw labeled diagram wherever necessary** **5x4=20**

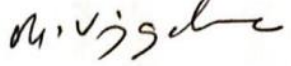






1. Value price
2. Market demand and individual demand
3. Fishery market survey
4. Fishermen cooperatives
5. Role of NABARD in fisheries
6. Adoption of innovation
7. IRDP
8. Education of farmers through electronic media
9. L.vanamei
10. MPEDA

SECTION-B

**II. Answer any FIVE of the following
Draw labeled diagram wherever necessary** **5x8=40**

11. a. Explain various factors influencing the fishery products price.
(or)
b. Describe the theory of production in relation to fisheries
12. a. Describe price determination of fishes in market.
(or)
b. Explain basic marketing functions of fish.
13. a. Explain cost and earning of shrimp farming systems.
(or)
b. Explain the role of Matsyafed in uplifting fishermen's condition.
14. a. Explain scope and objectives of fisheries extension education.
(or)
b. Explain fisheries extension methods
15. a. Describe the salient features of FFDA
(or)
b. Explain the role DAATT centers and their role in tot programs.

Signatures of the Memebbers in BOS

1. **Dr. M.VIJAYA KUMAR**
Lecturer in Zoology
SRR & CVR GDC (A) Vijayawada
(Chairman) 
2. **Dr.K.VEERAAIAH**
Professor
Department of Zoology & Aquaculture
Acharya Nagarjuna University,
Guntur.AP
(University Nominee)  21/02/2019
3. **Dr.CH.TULASI MASTANAMMA**
Associate Professor
Department of Zoology
Govt. Degree College for Women (A)
Guntur
(Subject Expert) 
4. **Dr.N.SREENIVAS**
Associate Professor
Department of Zoology
PR Govt.(A) College
Kakinada.AP
(Subject Expert)  21/2/2019
5. **Sri.RAGHURAM REDDY**
Neelagri Foundation
Atmakur,Guntur
(Special Member) 
6. **G.VANI**
Lecturer in Zoology
SRR & CVR GDC (A), Vijayawada
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7. **K. DURGA RAO**
Lecturer in Zoology
SRR & CVR GDC (A), Vijayawada
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8. **Sk.Parveen**
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