SRR & CVR GOVERNMENT DEGREE COLLEGE
(AUTONOMOUS)

VIJAYAWADA

DEPARTMENT OF ZOOLOGY

MINUTES OF THE MEETING

BOARD OF STUDIES (2017-18)

DATED : 17/03/2018

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

ZOOLOGY & AQUACULTURE TECHNOLOGY

SEMESTER-III & IV

SYLLABUS & 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.
Cell: 94922 34488 Ph: 0866-2430060 Fax: 0866-2441092 www.srrcvr.org srrandcvr@gmail.com

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 OF THE BOARD OF STUDIES IN ZOOLOGY

The meeting of the Board of Studies in the subject of **ZOOLOGY** was held on **17th March 2018** in Room No: **Zoology Department**, for III[rd] and IV[th] Semesters of II. B.Sc (BZC) and II. B.Sc (AT.Z.C) syllabus under the chairmanship of Dr. M.Vijaya Kumar, Head of the Zoology Department.**The following members attended the meeting:**

1. **Dr.K.VEERAIAH** **(University Nominee)**
   Associate Professor
   Department of Zoology & Aquaculture
   Acharya Nagarjuna University.
   Guntur.AP

2. **Dr.CH.TULASI MASTANAMMA** **(Subject Expert)**
   Lecturer in Zoology
   Govt. Degree College for Women (A)
   Guntur

3. **Dr.N.SREENIVAS** **(Subject Expert)**
   Lecturer in Zoology
   PR Govt.(A) College
   Kakinada.AP

4. **Sri.RAGHURAM REDDY** **(Special Member)**
   Neelagri Foundation
   Atmakur,Guntur

5. **Dr. M.VIJAYA KUMAR** **(In-charge of the Department & Chairman, BoS)**
   Lecturer in Zoology
   SRR & CVR GDC (A) Vijayawada

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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MINUTES OF THE MEETING OF THE BOARD OF STUDIES IN ZOOLOGY

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1. **Dr.K.VEERAIAH** 17/3/18 **(University Nominee)**
   Associate Professor
   Department of Zoology & Aquaculture
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   Lecturer in Zoology
   SRR & CVR GDC (A), Vijayawada

AGENDA

- For the approval of syllabus for Semester III and IV for the academic year 2018-19.
- For the approval of Question paper blue print and model papers
- For the approval of dividing the 100 marks into two components for Theory

a) External 60 Marks: Section-A consisting 20 Marks
Short Answer questions (Any 5 from given 10)
Section-B consisting 40Marks
Essay Questions (Any 5 with internal choice from given 10)

b) Internal 40Marks. To evaluate Internal Assessment as follows:-

1. Internal exams (2) -10 marks
2. Assignments (two) -10 marks
3. Project -10 marks
4. Seminar -05 marks
5. Attendance -05 marks
   Total -40 marks

- The pass mark is 40% i.e., 24 out of 60 for External and 16 out of 40 for Internal.
- For the approval of dividing the 50 marks into two components for Practicals

a) External 25 Marks:	1.Major dissection demonstration only	:	8 marks
	2.Mounting (2)/Minor dissection (1)	:	4 marks
	3.Identification (4)	:	8 marks
	4.Viva voce	:	5 marks
b) Internal 25 Marks. .	1. Assessment	:	10 marks
	2.Record	:	10 marks
	3.Field note book	:	5 marks

- The pass mark is 40% i.e., 10 out of 25 for External and Internal.
- Ratification and approval of the Newly introduced Market Oriented Course of Aquaculture Technology in B.Sc with combination of Zoology and Chemistry (ATZC) syllabus for Semester I and II for the academic year 2017-18 and approval of Semester III and IV for the academic year 2018-19.
- For approval of the list of paper setters and examiners
- For approval of the other Academic activities of the Department.
- For approval of the certificate course in vermicomposting
- For approval of any other matter with the permission of the Chairperson.

The Chairperson of the Board of Studies welcomed the members and initiated discussion on the syllabus for III and IV 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 III and IV with slight modifications.
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 approve the division of 100 marks into two components for Theory, External 60 Marks as Section-A consisting 20 Marks with Short Answer questions (Any 5 from given 10), Section-B consisting 40Marks with Essay Questions (Any 5 with internal choice from given 10)
4. Resolved to approve the division of Internal 40Marks to evaluate Internal Assessment as Two Internal exams for 10 marks, Two Assignments for 10 marks, Project work for 10 marks, Seminar for 05 marks and Attendance for 05 marks for Total of 40 marks
5. The pass mark is 40% i.e., 24 out of 60 for External and 16 out of 40 for Internal.
6. Resolved to approve the division of 50 marks into two components for Practicals, External 25 Marks as Major dissection/demonstration only for 8 marks, Mounting (2)/Minor dissection (1) for 4 marks, Identification for spotters (4) for 8 marks, Viva voce for 5 marks.
7. Resolved to approve the division of Internal 25 Marks as Assessment for 10 marks, Record for 10 marks, Field note book for 5 marks.
8. The pass mark is 40% i.e., 10 out of 25 for each External and Internal.
9. Resolved to ratify the Newly introduced Market Oriented Course of Aquaculture Technology in B.Sc with combination of Zoology and Chemistry (ATZC) syllabus for Semester I and II for the academic year 2017-18 and approval of Semester III and IV for the academic year 2018-19.
10. Resolved to use Virtual class room, ICT, Computer/Internet assisted learning for students regularly for teaching learning process.
11. Resolved to conduct student centric activities like Quiz, Group discussion etc
12. Resolved to arrange Field trips Surveys, Society outreach programmes etc.
13. Resolved to conduct Guest Lectures, Student Seminars, Study Projects etc
14. Resolved to give Assignments in the form of Critical, Innovative, Text book and Internet based
15. Resolved to use Learning Management System LMS
16. Resolved to implement one Research Based Pedagogical Tool each semester from 2018-19 for the Advanced learners in the classroom.
17. Resolved to advise the entire Faculty to apply for financial assistance to conduct Seminars/Workshops/Conferences /MRP's, etc.,
18. Resolved to approve the list of paper setters and examiners submitted by the department.
19. Resolved to include two Additional Inputs-1. Multiple Alleles- Blood groups in man in semester III, 2.Blood pressure in semester IV.
20. Resolved to approve certificate course in vermicomposting.

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II B.Sc BZC & ATZC

ZOOLOGY SYLLABUS

SEMESTER-III

PAPER – III

CYTOLOGY, GENETICS AND EVOLUTION

Periods: 60 **Max. Marks: 100**

Unit - I

Cytology: Definition, history, prokaryotic and eukaryotic cells, virus, viroids, mycoplasma

Electron microscopic structure of eukaryotic cell.

Plasma membrane –Different models of plasma membrane.

Unit – II

Cell organelles: Structure and functions of Endoplasmic Reticulum

Structure and functions of Golgi apparatus

Structure and functions of Lysosomes

Structure and functions of Ribosomes

Structure and functions of Mitochondria

Nucleus, Chromatin - Structure and significance, Chromosomes - Structure, types, functions

Unit – III- Genetics-I

Mendel's work on transmission on traits

Principles of inheritance, Incomplete dominance and codominance

Lethal alleles, Epistasis, Pleiotropy

Unit – IV- Genetics-II

Sex determination, Sex linked inheritance, Linkage and crossing over

Extra chromosomal inheritance, Human karyotyping

- **Addition Input**: Multiple Alleles- Blood groups in man

Unit – V- Evolution

Origin of life, Lamarckism, Darwinism, Neo – Darwinism

Hardy-Weinberg Equilibrium, Variations, Isolating mechanisms,

Natural selection, Types of natural selection (directional, stabilizing, disruptive)

Artificial selection and forces of evolution, Speciation (Allopatric and Sympatric)

Macro evolutionary principles (Example: Darwin's finches).

Reference Books:

- Genetics by P.K. Gupta Rastogi Publications
- A Text Book of Genetics by Dr. Veer Bala Rastogi
- Genetics by P.S.Varama
- Principles of Genetics by Basu M Hassain
- Text Book of molecular Biology K.Sivaram Sastry,G.Padmanaban, C.Subramanyam
- Cell Biology by C.B. Power
- An introduction to General Biology-B.S.Tomer and Dr. S.P Singh
- Cell Biology by K.G. Purohit
- Cytology, Genetics and Organic evolution by Dr. Ramesh Chand
- Evolution Genetics and Man by T. Dobzhansky
- Organic Evolution by Dr. Veer Bala Rastogi

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II B.Sc BZC & ATZC

ZOOLOGY PRACTICAL SYLLABUS

SEMESTER-III

PAPER – III

CYTOLOGY, GENETICS AND EVOLUTION

Periods: 24 **Max. Marks: 50**

I. Cytology

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

II. Genetics

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

III. Evolution

1. Study of fossil evidences
2. Study of homology and analogy from suitable specimens and pictures
3. Phylogeny of horse with pictures
4. Darwin's finches (pictures)
5. Study of Living Fossils and submission of project report.

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II B.Sc BZC & ATZC
ZOOLOGY THEORY

INTERNAL MARKS ALLOTMENT

SEMESTER-III

PAPER – III

CYTOLOGY, GENETICS AND EVOLUTION

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

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II B.Sc BZC & ATZC
ZOOLOGY THEORY

EXTERNAL MARKS ALLOTMENT

SEMESTER-III

PAPER – III

CYTOLOGY, GENETICS AND EVOLUTION

Zoology Theory- External **Total Marks: 60**

Section –A

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

Section –B

II. Essay Questions (With internal choice) 5x8=40

11 to 15

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II B.Sc BZC & ATZC

ZOOLOGY

PRACTICAL MARKS ALLOTMENT

SEMESTER-III

PAPER – III

CYTOLOGY, GENETICS AND EVOLUTION

Zoology Practical's - External

Time: 3 hrs. **Total Marks: 25**

1.Major dissection demonstration only	:	8 marks
(Identification-2M; Diagram-3M; Labelling-3M)		
2.Mounting (2)/Minor dissection (1)	:	4 marks (2+2)
3.Identification (4)	:	8 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

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II B.Sc BZC & ATZC

ZOOLOGY THEORY

SEMESTER-III

PAPER – III

CYTOLOGY, GENETICS AND EVOLUTION

BLUE PRINT MODEL FOR EXTERNAL EXAMINATIONS

	Section A **Short Questions**			**Section B** **Essay Questions**		
	NO OF QUESTIONS	**MARKS ALLOTED FOR EACH QUESTION**	**TOTAL MARKS**	**NO OF QUESTIONS**	**MARKS ALLOTED 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

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II B.Sc BZC & ATZC
ZOOLOGY
SEMESTER-III
PAPER – III
CYTOLOGY, GENETICS AND EVOLUTION

Time: 3 hrs **Max Marks: 60**

SECTION-A

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

1. Difference between Prokaryotes and Eukaryotes ప్రోకార్యోట్స్ మరియు యూకరేట్స్ మధ్య బేదలు
2. Mycoplasma మైకోప్లాస్మా
3. Lysosomes లైసోజోములు
4. Ribosomes రైబోసోములు
5. Epistatis ఎపిస్తసిస్
6. Pleiotropy ప్లీయోట్రోపీ
7. Downs syndrome డౌన్స్ సిండ్రోమ్
8. Colour Blindness వర్ణ అంధత్వం
9. Speciation జాతుల ఉత్పత్తి
10. Hardy Weinberg Law హార్డీ వీన్బర్గ్ నియమం

SECTION-B

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

11. a) Describe the ultra structure of a Eukaryotic cell
నిజకంద్రక కణం యొక్క అల్ట్రా నిర్మాణం వివరించండి

(or)

b) Give an account on structure and functions of plasma membrane
ప్లాస్మా త్వచం యొక్క నిర్మాణం మరియు విధులను వివరించండి

12. a) Describe the structure and functions of Endoplasmic Reticulum .
అంతర్జీవ ద్రవజాలం యొక్క నిర్మాణం మరియు విధులను వివరించండి.

(or)

b) Give an account of the structure and functions of Nucleus.
కేంద్రకం యొక్క నిర్మాణం మరియు విధుల గురించి తెలియజేయండి.

13. a) Explain mendals laws of heredity with suitable examples

మెండల్స్ అనువంశిక సూత్రాలను తగిన ఉదాహరణలతో వివరించండి

(or)

b) Explain Incomplete dominance and Co dominance with examples.

అసంపూర్ణ బహిర్గతత్వం మరియు సహ బహిర్గతత్వంను ఉదాహరణలతో వివరించండి.

14. a) What are sex chromosomes ? Explain their role in determination of sex.

లైంగిక క్రోమోజోములు అంటే ఏమిటి? లైంగిక నిర్ధారణ క్రోమోజోములు పాత్రను వివరించండి.

(or)

b) Explain about Extra chromosomal inheritance in paramecium.

పెరామీషియం నందు కణజీవద్రవ్య ఆనువంశికత గురించి వివరించండి.

15. a) Write as essay on isolation.

వివక్తత పై వ్యాసం వ్రాయండి.

(or)

b) What is macro evolution? Explain it with adaptive radiation in Darwins finches (birds).

స్థూల పరిణామం అంటే ఎమిటి? డార్విన్ ఫిన్చెస్ (పక్షులు) లో అనుకూల వికిరణం గూర్చి వివరించండి.

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II B.Sc BZC & ATZC
ZOOLOGY SYLLABUS
SEMESTER-IV
PAPER – IV
EMBRYOLOGY, PHYSIOLOGY AND ECOLOGY

Periods:60 **Max. Marks: 100**

Unit-I-Developmental Biology and Embryology

Gametogenesis, Fertilization, Types of eggs, Types of cleavages
Development of Frog upto formation of primary germ layers
Formation and functions of Foetal membrane in chick embryo Development
Types and functions of Placenta in mammals

Unit – II- Physiology-I

Elementary study of process of digestion
Absorption of digested food
Respiration - Pulmonary ventilation, transport of oxygen and carbondioxide
Circulation - Structure and functioning of heart, Cardiac cycle
Excretion - Structure of nephron, Urine formation.

- **Additional Input-** Blood pressure

Unit-III-Physiology-II

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

Unit – IV-Ecology-I

Meaning and scope of Ecology
Important abiotic factors of Ecosystem - Temperature, light, water, oxygen and CO2
Nutrient cycles - Nitrogen, carbon and phosphorus
Components of Ecosystem with Lake as example, Food chains and Food web, Energy flow in ecosystem

Unit – V-Ecology – II

Habitat and ecological niche, Community interactions - Mutualism, commensalism, parasitism, competition, Predation.
Ecological succession, Population studies
Zoogeography-Zoogeographical regions, Study of physical and faunal peculiarities of Oriental, Australian and Ethiopian regions

References Books:

- Developmental Biology by Dr. Veera Bala Rastogi
- Animal Physiology by Nagabhushanam
- Embryology by G. Anjaneyulu
- Elements of Embryology by P.K.G. Nair
- Animal Physiology by A.K.Berry
- Animal Ecology by S.P. Singh
- Animal Ecology and Distribution of Animals by Veer Bala Rastogi
- Paleontology and Zoogeography by Veera Bala Rastogi
- Ecology by Odum

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II B.Sc BZC & ATZC
ZOOLOGY PRACTICAL SYLLABUS
SEMESTER-IV
PAPER – IV
EMBRYOLOGY, PHYSIOLOGY AND ECOLOGY

Periods: 24 **Max. Marks: 50**

I. Embryology

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

II. Physiology

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

III. Ecology

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

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II B.Sc BZC & ATZC
ZOOLOGY THEORY

INTERNAL MARKS ALLOTMENT

SEMESTER-IV

PAPER – IV

EMBRYOLOGY, PHYSIOLOGY AND ECOLOGY

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

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II B.Sc BZC & ATZC
ZOOLOGY THEORY

EXTERNAL MARKS ALLOTMENT

SEMESTER-IV

PAPER – IV

EMBRYOLOGY, PHYSIOLOGY AND ECOLOGY

Zoology Theory- External **Total Marks: 60**

Section –A

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

Section –B

II. Essay Questions (With internal choice) 5x8=40

11 to 15

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

II B.Sc BZC & ATZC

ZOOLOGY

PRACTICAL MARKS ALLOTMENT

SEMESTER-IV

PAPER – IV

EMBRYOLOGY, PHYSIOLOGY AND ECOLOGY

Zoology Practical's - External

Time: 3 hrs. **Total Marks : 25**

1.Major dissection demonstration only	:	8 marks
(Identification-2M; Diagram-3M; Labelling-3M)		
2.Mounting (2)/Minor dissection (1)	:	4 marks(2+2)
3.Identification (4)	:	8 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.

II B.Sc BZC & ATZC

ZOOLOGY THEORY

SEMESTER-IV

PAPER – IV

EMBRYOLOGY, PHYSIOLOGY AND ECOLOGY

BLUE PRINT MODEL FOR EXTERNAL EXAMINATIONS

	Section A **Short Questions**			**Section B** **Essay Questions**		
	NO OF QUESTIONS	**MARKS ALLOTED**	**TOTAL MARKS**	**NO OF QUESTIONS**	**MARKS ALLOTED**	**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.
II B.Sc BZC & ATZC
ZOOLOGY (w.e.f. 2017-18)
SEMESTER-IV
PAPER – IV
EMBRYOLOGY, PHYSIOLOGY AND ECOLOGY

Time: 3 hrs **Max Marks: 60**

SECTION-A

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

1. Types of eggs అండాలు రకాలు
2. Blastula బ్లాస్టులా
3. Proteins digestion ప్రోటీన్ల జీర్ణక్రియ
4. Chloride shift క్లోరైడ్ షిఫ్ట్
5. Action potential క్రియ శక్యం
6. Pancreas క్లోమ గ్రంధి
7. Carbon cycle కార్బన్ వలయం
8. Food chains ఆహార గొలుసులు
9. Growth curves పెరుగుదల వక్రాలు
10. Ecological niche అవరణ స్థాయి

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

11. a) Describe the process of spermatogenesis and draw the structure of sperm.
స్పెర్మోటోజెనెసిస్ ప్రక్రియ వివరించండి మరియు శుక్రకణ నిర్మాణం గురించి వివరించండి

(Or)

b) What is placenta? Describe the different types of placenta.
జారాయువు అంటే ఏమిటి? వివిధ రకాల జారాయువు గురించి వివరించండి.

12. a) Describe the structure and working of heart.
హృదయ నిర్మాణం మరియు పనిచేయు విధానం వివరించండి.

(Or)

b) Explain the formation of urine in mammals.
క్షీరదాలలో మూత్రం ఏర్పడే విదానం వివరించండి.

13. a) Describe the mechanism of muscle contraction.
కండర సంకోచ ప్రక్రియ విధానం వివరించండి

(Or)

b) Describe the structure and hormones of pituitary gland.
పిట్యుటరీ గ్రంధి యొక్క నిర్మాణం మరియు హార్మోన్లు వివరించండి.

14. a) Explain the importance of light as an abiotic factor in ecosystem.
ఆవరణ వ్యవస్థలో నిర్జీవ కారకంగా కాంతి యొక్క ప్రాముఖ్యతను వివరించండి.

(Or)

b) Describe the components in Lake Ecosystem?
కొలను అవరణవ్యవస్థలో భాగాలను వివరించండి?

15. a) Describe the different types of community interactions?
వివిధ రకాలు **జంతు సమాజాల సహచర్యాలను** గురించి వివరించండి?

(Or)

b) Give an account of physical and faunal features of oriental region.
ఓరియంటల్ ప్రాంతం యొక్క బౌతిక మరియు జంతు సంపద గురించి తెలియజేయండి

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SRR & CVR GOVERNMENT DEGREE COLLEGE (AUTONOMOUS)

VIJAYAWADA

DEPARTMENT OF ZOOLOGY

(2018-19)

NEW COURSE- AQUACULTURE TECHNOLOGY

(AS PER APSCHE w.e.f 2017-18)

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

SEMESTER-III & IV SYLLABUS

Blue Print and Model question papers

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

AQUACULTURE TECHNOLOGY SYLLABUS
SEMESTER-III
PAPER – III
FISH NUTRITION & FEED TECHNOLOGY

Periods: 60 **Max.marks: 100**

UNIT-I: NUTRITIONAL REQUIREMENTS OF CULTIVABLE FISH

1-1 Requirements for energy, proteins, carbohydrates, lipids, fiber, micronutrients for different stages of cultivable fish and prawns
1-2 Essential aminoacids and fatty acids, protein t0 energy ratio, nutrient interactions and protein sparing effect
1-3 Dietary sources of energy, effect of ration on growth, determination of feeding rate, check tray
1-4 Factors affecting energy partitioning and feeding

UNIT-II: FORMS OF FEEDS & FEEDING METHODS

2-1 Fed conversion efficiency, feed conversion ratio and protein efficiency ratio
2-2 Wet feeds, moist feeds, dry feeds, mashes, pelleted feeds, floating and sinking pellets, advantages of pelletization
2-3 Manual feeding, demand feeders, automatic feeders, surface spraying, bag feeding and tray feeding
2-4 Frequency of feeding

UNIT-III: FEED MANUFACTURE & STORAGE

3-1 Feed ingredients and their selection, nutrient composition and nutrient availability of feed ingredients
3-2 Feed formulation – extrusion processing and steam pelleting, grinding, mixing and drying, pelletization, and packing
3-3 Water stability of feeds, farm made aqua feeds, micro-coated feeds, micro-encapsulated feeds and micro-bound diets
3-4 Microbial, insect and rodent damage of feed, chemical spoilage during storage period and proper storage methods

UNIT-IV: FEED ADDITIVES & NON-NUTRIENT INGREDIENTS

4-1 Binders, anti-oxidants, probiotics
4-2 Feed attractants and feed stimulants
4-3 Enzymes, hormones, growth promoters and pigments
4-4 Anti-metabolites, afflatoxins and fiber

UNIT-V: NUTRITIONAL DEFICIENCY IN CULTIVABLE FISH

5-1 Protein deficiency, vitamin and mineral deficiency symptoms
5-2 Nutritional pathology and ant-nutrients
5-3 Importance of natural and supplementary feeds, balanced diet

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

AQUACULTURE TECHNOLOGY PRACTICAL SYLLABUS

SEMESTER-III

PAPER – III

FISH NUTRITION & FEED TECHNOLOGY

Periods: 24 **Max. Marks: 50**

1. Estimation of protein content in aquaculture feeds
2. Estimation of carbohydrate content in aquaculture feeds
3. Estimation of lipid content in aquaculture feeds
4. Estimation of ash in aquaculture feed
5. Study of water stability of pellet feeds
6. Feed formulation and preparation in the lab
7. Study of binders used in aquaculture feeds
8. Study of feed packing materials
9. Study of physical and chemical change during storage
10. Study on physical characteristics of floating and sinking feeds
11. Visit to a aqua-feed production unit
12. Visit to a farm for studying feeding practices

PRESCRIBED BOOK(S):

1. HALVER JE 1989. Fish nutrition. Academic press, San diego

REFERENCES:

1. Lovell rt 1998. Nutrition and feeding of fishes, Chapmann & Hall, New York
2. Sena de silva, trevor a anderson 1995. Fish nutrition in aquaculture**.** Chapmann & Hall, New York

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

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

INTERNAL MARKS ALLOTMENT

SEMESTER-III

PAPER – III

FISH NUTRITION & FEED TECHNOLOGY

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.

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

EXTERNAL MARKS ALLOTMENT

SEMESTER-III

PAPER – III

FISH NUTRITION & FEED TECHNOLOGY

Aquaculture :Theory- External **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-III

PAPER – III

FISH NUTRITION & FEED TECHNOLOGY

Practical's - External

Time: 3 hrs. **Total Marks: 25**

1. Identification of given sample	:	6 marks
2. Identification of given sample	:	6 marks
3.Identification	:	8 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.

II B.Sc (AT.Z.C) AQUACULTURE TECHNOLOGY
SEMESTER-III
PAPER – III
FISH NUTRITION & FEED TECHNOLOGY
BLUE PRINT MODEL FOR EXTERNAL EXAMINATIONS

	Section A **Short Questions**			**Section B** **Essay Questions**		
	NO OF QUESTIONS	**MARKS ALLOTED FOR EACH QUESTION**	**TOTAL MARKS**	**NO OF QUESTIONS**	**MARKS ALLOTED 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.
II B.Sc (AT.Z.C) AQUACULTURE TECHNOLOGY
SEMESTER-III
PAPER – III
FISH NUTRITION & FEED TECHNOLOGY

Time: 2½ hrs **Max Marks: 60**

SECTION-A

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

1. Lipids
2. Check tray
3. Feed conversion efficiency
4. Bag feeding
5. Extrusion processing
6. Micro-coated feeds
7. Anti-oxidants
8. Afflatoxins
9. Ant-nutrients.
10. Balanced diet.

SECTION-B

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

11. a. Explain essential amino acids required for cultivable fish
(or)
b. Describe various carbohydrates and micronutrients for different stages of cultivable fish

12. a. Explain various feeds
(or)
b. Describe different feeding methods.

13 a. Explain nutrient composition and nutrient availability of feed ingredients..
(or)
b. Describe feed storage methods

14. a. Explain Probiotics role in fishes
(or)
b. Describe Enzymes and growth promoters

15. a. Explain Protein and Vitamin deficiency symptoms.
(or)
b. Describe natural and supplementary feed importance.

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

AQUACULTURE TECHNOLOGY SYLLABUS
SEMESTER-IV
PAPER – IV
FRESH WATER & BRACKISHWATER AQUACULTURE

Periods: 60 **Max. marks: 100**

UNIT-1: INTRODUCTION TO FRESHWATER AQUACULTURE

1-1.1 Status, scope and prospects of fresh water aquaculture in the world, India and AP

1-1.2 Different fresh water aquaculture systems

UNIT-II: CARP CULTURE

2-1 Major cultivable Indian carps – Labeo, Catla and Cirrhinus & Minor carps

2-2 Exotic fish species introduced to India – Tilapia, Pangassius and Clarius sp.

2-3 Composite fish culture system of Indian and exotic carps

2-4 Impact of exotic fish, Compatibility of Indian and exotic carps and competition among them

UNIT-III: CULTURE OF AIR-BREATHING AND COLD WATER FISH

3-1 Recent developments in the culture of clarius, anabas, murrels,

3-2 Advantages and constraints in the culture of air-breathing and cold water fishes- seed resources, feeding, management and production

3-3 Special systems of Aquaculture- brief study of culture in running water, re-circulatory systems, cages and pens, sewage-fed fish culture

UNIT-IV: CULTURE OF PRAWN

4-1 Fresh water prawns of India - commercial value

4-2 *Macrobrachium rosenbergii* and *M. Malcomsonii* – biology, seed production, pond preparation, stocking, management of nursery and grow-out ponds, feeding, mprphotypes and harvesting

UNIT-V: CULTURE OF BRACKISHWATER SPECIES

5-1 Culture of P.mondon – Hatchery technology and Culture practices including feed and disease management

5-2 Culture of L. vannamei – hatchery technology and culture practices including feed and disease management.

5-3 Mixed culture of fish and prawns

SRR & CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA.
AQUACULTURE TECHNOLOGY PRACTICAL SYLLABUS
SEMESTER-IV
PAPER – IV
FRESH WATER & BRACKISHWATER AQUACULTURE

Periods: 24 **Max. Marks: 50**

1. Identification of important cultivable carps
2. Identification of important cultivable air-breathing fishes
3. Identification of important cultivable fresh water prawns
4. Identification of different life history stages of fish
5. Identification of different life history stages of fresh water prawn

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6. Collection and study of weed fish
7. Identification of commercially viable crabs – Scylla cerrata, Portunus pelagicus, P.sanguinolentus, Neptunus pelagicus, N. Sanguinolentus
8. Identification of lobsters – Panulirus polyphagus, P.ornatus, P.homarus, P.sewelli, *P.penicillatus*
9. Identification of oysters of nutritional significance – Crossostrea madrasensis, C.gryphoides, C. cucullata, C.rivularis , Picnodanta
10. Identification of mussels and clams
11. Identification of developmental stages of oysters
12. Field visit to aqua farm and study of different components like dykes etc.

PRESCRIBED BOOK(S):

1. Jhingran VG 1998. Fish and Fisheries of India. Hindusthan Publishing Corporation, New Delhi

REFERENCES:

1. Santharam R, N Sukumaran and P Natarajan 1987. A manual of aquaculture, Oxford-IBH, New Delhi
2. Srivatsava 1993. Fresh water aquaculture in India, Oxford-IBH, New Delhi
3. Marcel H 1972. Text book of fish culture.Oxford fishing news books

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

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

INTERNAL MARKS ALLOTMENT

SEMESTER-IV

PAPER – IV

FRESH WATER & BRACKISHWATER AQUACULTURE

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.

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

EXTERNAL MARKS ALLOTMENT

SEMESTER-IV

PAPER – IV

FRESH WATER & BRACKISHWATER AQUACULTURE

Theory- External **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.

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

PRACTICAL MARKS ALLOTMENT

SEMESTER-IV

PAPER – IV

FRESH WATER & BRACKISHWATER AQUACULTURE

Practical's - External

Time: 3 hrs. **Total Marks : 25**

1. Identification of mouth/appendages parts :		6 marks
2. Gut analysis/length-weight relationship/ Study of eggs	:	6 marks
3.Identification/observation	:	8 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.

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

SEMESTER-IV

PAPER – IV

FRESH WATER & BRACKISHWATER AQUACULTURE

BLUE PRINT MODEL FOR EXTERNAL EXAMINATIONS

	Section A **Short Questions**			**Section B** **Essay Questions**		
	NO OF QUESTIONS	**MARKS ALLOTED**	**TOTAL MARKS**	**NO OF QUESTIONS**	**MARKS ALLOTED**	**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.
II B.Sc (AT.Z.C) AQUACULTURE TECHNOLOGY
SEMESTER-IV
PAPER – IV
FRESH WATER & BRACKISHWATER AQUACULTURE

Time: 2½ hrs **Max Marks: 60**

SECTION-A

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

1. .Fresh water aquaculture system
2. Aquaculture status in India
3. Exotic fishes
4. Minor carps
5. re-circulatory system
6. Sewage-fed fish culture
7. Seed production
8. grow-out ponds
9. P.Monodon
10. Mixed culture.

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

11. a. Describe status and prospects of fresh water aquaculture in A.P.
(or)
b. Explain fresh water aquaculture system.

12. a. Write an essay on major cultivable Indian carps
(or)
b. Describe composite fish culture system of Indian and exotic carps.

13. a. Explain recent culture trends in murrels
(**or)**
b. Explain advantages in the culture of air-breathing and cold water fishes
.

14. a. Write an essay commercial value of Indian fresh water prawn.
(or)
b. Explain Macrobrachium rosenbergii culture .

15. a. Explain feed and disease management in P.monodon culture.
(or)
b. Describe hatchery technology and culture practice in L. vannamei.

Signatures of the Memebers in BOS

1. **Dr.K.VEERAIAH**
   Associate Professor
   Department of Zoology & Aquaculture
   Acharya Nagarjuna University,
   Guntur.AP

   (University Nominee) 17/3/18

2. **Dr.CH.TULASI MASTANAMMA**
   Lecturer in Zoology
   Govt. Degree College for Women (A)
   Guntur

   (Subject Expert)

3. **Dr.N.SREENIVAS**
   Lecturer in Zoology
   PR Govt.(A) College
   Kakinada.AP

   (Subject Expert)

4. **Sri.RAGHURAM REDDY**
   Neelagri Foundation
   Atmakur,Guntur

   (Special Member)

5. **Dr. M.VIJAYA KUMAR**
   Lecturer in Zoology
   SRR & CVR GDC (A) Vijayawada

   (In-charge of the Department & Chairman, BoS) 17/3/18

6. **G.VANI**
   Lecturer in Zoology
   SRR & CVR GDC (A), Vijayawada

   (Faculty Member)

7. **K. DURGA RAO**
   Lecturer in Zoology
   SRR & CVR GDC (A), Vijayawada

   (Faculty Member) 17/3/18

8. **Sk.Parveen**
   Lecturer in Zoology
   SRR & CVR GDC (A), Vijayawada

   (Faculty Member) 17/3/18