

**A.G&S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE**

**VUYYURU, KRISHNA Dt, A.P.**

**Accredited by NAAC with “A” Grade**



**DEPARTMENT OF ZOOLOGY**

**BOARD OF STUDIES 16-10-2019**

**ODD SEMESTER**

**2019-20**



Minutes of the meeting of Board of studies in Zoology for the Autonomous courses of AG & SG Siddhartha Degree College of Arts & Science, Vuyyuru, held at 10.30 AM on 16-04-2019 in the Department of Zoology.

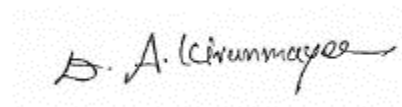
Smt.D.A. Kiranmayee. ... Presiding

Members Present:

- 1) D. A. Kiranmayee Chair person Head, Department of Zoology,  
(Smt. D.A.Kiranmayee.) A.G&S.G.S Degree College of  
Vuyyuru-521165.
- 2) J. N. Lavanya Latha University Nominee Dr. J.N.Lavanya Latha,  
(Dr.J.N.Lavanya Latha.) Krishna University,  
Machilipatnam.
- 3) K. Daniel Academic Council Head, Department of Zoology,  
(Dr. K.Daniel.) Nominee JKC College,  
Guntur,
- 4) B. Elia Academic Council Head, Department of Zoology,  
(B.Elia.) Nominee Gov. Degree College,  
Pitapuram.
- 5) B. Appala Naidu Industrialist Asst. Project Manager,  
(B. Appala Naidu.) RGCA  
Manikonda.
- 6) Ch. Chiranjeevi Student Represent P.hD –Research Scholar,  
(Ch.Chiranjeevi.) Dept.of Botany & Microbiology,  
Acharya Nagarjuna University,  
Guntur.
- 7) M. Lakshmi Priyanka Member Lecturer in Zoology,  
(kum.M.Lakshmi Priyanka.) A.G&S.G.S Degree College  
Vuyyuru-521165.

**AGENDA for BOS Meeting**

- 1.To review and recommend the syllabi (theory and Practical), Model question paper and guidelines for Semester I of B. Sc. (BZC) under the CBCS system
2. To recommend the additions made for the III Semester ZOO-301C of II B. Sc. (BZC) syllabus and model paper in the academic year 2019-20.
- 3.To discuss the syllabus of V Semester Zoo- 501 and Zoo-502 and make necessary additions and deletions in the syllabus and model paper in the academic year 2019-20.
- 4.To recommend the teaching and evaluation methods to be followed under Autonomous status.
5. Any other matter.

**Chairman**

## Resolution

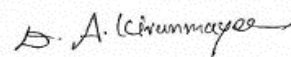
1. It is resolved to continue the same syllabi (Theory and Practical), Model Question paper of SEM I of I B. Sc. (BZC) under the CBCS system

2. It is resolved to add DNA - Watson & Crick Model, Semi conservative replication and Structure, Types and Functions of RNA in Unit II, and Blood Group Inheritance in Unit IV of III Semester of II B. Sc. (BZC) under the CBCS system.

3. It is resolved to delete Genomics and c-DNA Libraries, preparation and uses from unit II of V Semester of Animal Biotechnology, Zoo- 501 of III B. Sc. (BZC) under the CBCS system.

4. It is resolved to continue the same syllabus for V Semester of Animal Husbandry Zoo- 502 of III B. Sc. (BZC) under the CBCS system.

4. It is resolved to continue the previous year teaching and evaluation methods for the academic year 2019-20 also.



**Chairman**

**ADUSUMILLI GOPALAKRISHNAIAH & SUGAR CANE GROWERS SIDDHARTHA DEGREE COLLEGE  
OF ARTS & SCIENCE, VUYYURU-521165, KRISHNA Dt.,A.P. (AUTONOMOUS).**

**ZOOLOGY**

**Class: I B.Sc .**

**PAPER-I**

**w.e.f. 2017-2018**

**Credits : 3**

**Code: Zoo-101C)**

**Title of the paper: Biology of Non – Chordates.**

**Max.Marks : 70**

60 hrs.(4hrs/week)

**Objective of the course:** To introduce the basic principles Biology of Non –Chordates, different types of based on specific characters and the phyla.

**Course outcomes:**

- ❖ Students can easily understand the phylogeny of life, connecting link between different phyla and the diversity of fauna.
- ❖ They learn the general characters of each phylum and their classification and identify animals using different taxonomical keys.
- ❖ Students get the essentials of each body part and their functioning.
- ❖ The students will have knowledge on useful and harmful animals
- ❖ They learn more about the structure and characters of Larval forms

**UNIT- I**

**10hrs.**

- 1.1: Significance of Diversity of Invertebrates.
- 1.2: **Phylum - Protozoa:** Type study: Elphidium
- 1.3: **Phylum - Porifera :**Type study: Sycon - Morphology, histology, spicules
- 1.4: Canal system in Sponges.

**UNIT-II**

**16hrs.**

- 2.1 **Phylum - Coelenterata :**Type study : Obelia - Morphology, Structure of Polyp & Medusa.
- 2.2: Polymorphism in Coelenterates.
- 2.3: Coral& Coral reef formation.
- 2.4. **Phylum- Platyhelminthes:** Type study: Fasciola hepatica – Morphology, Excretory system, Reproductive system, Life history & Pathogenicity
- 2.5 **Phylum - Nematelminthes:**Type study: Ancylostoma duodenale - Morphology & Life history

**UNIT-III**

**10hrs.**

- 3.1 **Phylum - Annelida:**Type study:Hirudinaria granulose – Morphology, Digestive system, excretory system & Reproductive system.
- 3.2: Coelomoducts.
- 3.3: Vermiculture: Scope, Significance of Vermiculture, Earthworms Sps, Processing of Vermiculture, Vermicompost, and Economic Importance of Vermicompost.

**UNIT-IV**

**15hrs.**

- 4.1 **Phylum - Arthropoda :** Type study: Prawn – External characters [Except appendages], Respiratory system & Circulatory system.
- 4.2 Peripatus : Structure & affinities.
- 4.3 **Phylum – Mollusca:** Pearl Formation in Pelecypoda.
- 4.4. Torsion in Gastropoda.

**UNIT- V**

**9hrs.**

- 5.1: **Phylum - Echinodermata :**
- 5.1.1 Water vascular system of Star Fish.
- 5.2 **Hemichordata :**Balanoglossus: Structure , Affinities.
- 5.3. **Invertebrates Larval forms :**Amphiblastula, Ephyra, Trochophore, Nauplius, Glochidium, Bipinnaria, Tornaria.

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**A.G. & S.G.Siddhartha Degree College of Arts & Science, Vuyyuru – 521165,  
Krishna Dt. A.P. (Autonomous)**

**Semester – I**

w.e.f. 2017-2018

**Title of the paper: Biology of Non – Chordates. Code – Zoo-101C**

**Time: 3hrs.**

**max.marks: 70**

**Section – A**

**4 x 5= 20.**

Answer any **four** questions. Each question carries **five** marks. Draw neat labeled diagrams wherever necessary.

- |   |                                     |
|---|-------------------------------------|
| 1.Spicules in Sycon.                      | సైకాన్ లో కంటకముల రకములు            |
| 2. Structure of medusa in obelia.         | ఒబీలియాలో మెడ్యూసా నిర్మాణము        |
| 3. Life history of Ancylostoma duodenale. | ఎంఘైలోస్టోమ డియోడినేల్ జీవిత చరిత్ర |
| 4. Coelomoducts in Annelida.              | అనెలిడాలో శరీర కుహర నాళికలు         |
| 5. Significance of Vermiculture .         | వర్మికల్చర్ ప్రాముఖ్యత              |
| 6. Affinities of Peripatus .              | పెరిపాటస్ సంబంధ బాంధవ్యములు         |
| 7. Structure of Balanoglossus .           | బెలనోగ్లోసస్ నిర్మాణము              |
| 8. Bipinnaria Larva.                      | బైపిన్నేరియా డింభకము                |

**Section – B**

**5 x 10 =50.**

Answer any **five** questions. Each question carries **Ten** marks. Draw neat labeled diagrams wherever necessary.

- 9.Elphidium shows alternation of generations in its life cycle – discuss.  
ఎల్ఫీడియం తన జీవిత చరిత్రలో ఏకాంతర తరాలను చూపించును- వివరింపుము.
- 10.Write an account of canal system in Porifera.  
పోరిఫెరా జీవులలో కుల్యా వ్యవస్థను విశదీకరించండి.
- 11.Describe briefly the phenomenon of polymorphism in Coelenterates.  
సీలెంటరేటా వర్గములో బహురూపకతను వివరించండి.
12. Describe the life history of Fasciola hepatica.  
ఫాసియోలా హిపాటికా జీవిత చరిత్రను గురించి వివరింపుము.
- 13.Describe the excretory system in leech.  
జలగలో విసర్జక వ్యవస్థను వివరింపుము.
- 14.Explain the respiratory system in prawn.  
రొయ్యలో శ్వాస వ్యవస్థను వివరించుము.
15. Explain the process of peral formation in pelecypoda.  
పెలిసిపోడా జీవులలో ముత్యము ఏర్పడు విధానమును వివరింపుము.
- 16.Describe the Wter vascular system in Starfish.  
సముద్ర నక్షత్రములో జలప్రసరణ వ్యవస్థను వివరించండి.

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**A.G. & S.G.Siddhartha Degree College of Arts & Science, Vuyyuru – 521165,  
Krishna Dt. A.P. (Autonomous)**

**Semester - I**

**Guide lines to the Paper Setter.**

**W.e.f. 2017-2018**

**Title of the paper: Biology of Non – Chordates. Code – Zoo-101C**

**Time: 3hrs.**

**Max. Marks: 70.**

1. Answer any **four** questions out of eight in Section – A. Each question carries **five** marks. 4x5 = 20M
2. Answer any **five** questions out of eight in Section – B. Each question carries **Ten** marks. 5x10= 50M.

	Section	UNIT-I (Protozoa - Porifera)	UNIT-II (Coelenterata- Nemathelminthes)	UNIT-III ( Annelida)	UNIT-IV (Arthropoda – Mollusca)	UNIT-V (Echinodermata – Hemichordata)
<b>5 Marks Questions</b>	<b>A</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>2</b>
<b>10 Marks Questions</b>	<b>B</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>
<b>Weightage</b>		<b>25</b>	<b>30</b>	<b>20</b>	<b>15</b>	<b>20</b>

**Note:** 1. please provide the scheme of valuation for the paper.

2. Question paper should be both in English and Telugu media.

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w.e.f. 2017-2018  
MAX.MARKS : 50.

Code :Zoo- 101P

(2hrs/week)

[ANIMAL DIVERSITY - NON CHORDATES]

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

**Protozoa** – General characters & Outline classification upto Classes with examples.

Elphidium, Paramecium –binary fission & Conjugation.

**Porifera** -General characters & Outline classification upto Classes with examples

Spongilla, Euspongia, Sycon, Sycon – L.S, T.S.

**Coelenterata** - General characters & Outline classification upto Classes with examples.

Obelia Colony , Medusa, Physalia, Velella, Corallium, Gorgonia, Aurelia, Pennatula

**Platyhelminthes** - General characters & Outline classification upto Classes with examples

. Planaria, Larval stages of Fasciola– Miracidium, Redia, Cercaria, Echinococcus granulosus

**Nemathelminthes** - General characters & Outline classification upto Classes with examples.

Ascaris male & female, Ancylostoma duodenale.

**Annelida** - General characters & Outline classification upto Classes with examples.

Neries, Heteroneries, Aphrodite, Hirudo, Trochophore Larva.

**Arthropoda** - General characters & Outline classification upto Classes with examples.

Mouth parts of male & female Anopheles& Culex, Mouth parts of House fly,

Nauplius , Mysis , Zoea Larvae. Scorpion, Crab, Prawn , Scolopendra, Sacculina Limulus,  
Peripatus.

**Mollusca** - General characters & Outline classification upto Classes with examples.

Chiton, Murex, Sepia , Loligo, Octopus, Nautilus, Glochidium larva.

**Echinodermata** - General characters & Outline classification upto Classes with examples.

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

**Hemichordata**- Balanoglossus, Tornaria larva.

**Demonstration of dissection / dissected / Virtual Dissections.**

1. Leech / Prawn / Scorpion / Crab - Digestive system .

2. Prawn - Appendages,

3. Prawn / Scorpion / Crab - Nervous system,

4. Pila / Unio – Digestive system,

5. Mounting of statocyst

6. 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.**



**EXTERNAL PRACTICAL- I**  
(Animal Diversity of Invertebrates)  
**MODEL QUESTION PAPER -I** Code: ZOO-101P  
**EXTERNAL PRACTICAL- I**

(2hrs/week)

**Time: 3 hrs.**

**Max.marks: 25m.**

- |  |         |
|--|---------|
| I. Draw neat labeled diagram of Digestive system Leech.                      | 6M.     |
| II .Draw neat labeled diagram of Radula of Pila.                             | 4M.     |
| III. Spotters: Identify, draw labeled diagram & write notes on<br>A, B, C, D | 4X3=12M |
| 1. Viva.   | 3M      |
| TOTAL: -----   | 25M.    |

**Guide lines for the practical Examiners**

- I. **List of dissections** : ( 8marks for diagram & 2 marks for labeling)  
Leech/Prawn/Scorpion/Crab- Digestive system.  
Prawn – Appendages.  
Prawn / Scorpion /Crab- Nervous system  
Pila / Unio – Digestive system.
- II.Mounting of Statocyst / Mounting of Radula. (Mounting 4 marks, labeled diagram 1 marks)
- III.Spotters:** 1Mark for identification, 1 Mark for labeled diagram & 3Mark for notes for each spotter.
- Invertebrates: 4 specimens / slides / models.**

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**A. G.& S.G. SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE, VUYURU-521165**  
**INTERNAL PRACTICAL- I**

(2 hrs/week).

**(Animal Diversity of Invertebrates)Code: ZOO-101P.**

**MODEL QUESTION PAPER -I**

**Max.marks:25M.**

**Time: 3hrs.**

- |  |                  |
|--|------------------|
| 1. Attendance -----                    | 05M.             |
| 2. Record -----                        | 10M.             |
| 3. Field note book. -----              | 05M              |
| 4. Project (Within the syllabus) ----- | 05M.             |
|  | Total ----- 25M. |

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***Reference Books :-***

1. Modern Text Book of Zoology - vertebrates..... R.L.Kotpal
2. A Text Book Zoology ..... EkambarnathAyya

**SEMESTER - III (CBCS)**

w.e.f. - 2019 – 2020.

**Class:** II B.Sc (B.Z.C)

**Paper Code:** ZOO -301C 60 Hrs (4hrs/

**week)**

**Max.Marks: 70**

**Credits:** 3

**Title of the Paper:** Cytology, Genetics and Evolution.

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**Objective of the course:** To impart knowledge on the structural and functional aspects of cell, cell molecules that contribute to the mystery of life, basic structures of DNA, RNAs, their specific roles and genes that play vital role in transmission of parental characters to the offspring.

**Course outcomes:**

- ❖ This study will help students to understand the variation of species with its basic and functional unit that is the cell and its components.
- ❖ They learn more about the structure and functions of DNA and RNAs.
- ❖ Students will test and deepen their mastery of genetics by applying this knowledge in a variety of problem- solving situations.
- ❖ They get to know genes in depth level and their role in transmission of parental characters.
- ❖ Understand that evolution involves genetic change in the composition of populations, the process of allopatric speciation.

**Unit – I**

**1.1 Cytology - I** :- Electron microscopic structure of cell .

**10 Hrs**

1.2 Plasma membrane - Fluid mosaic model, Transport functions of plasma membrane (Active & Passive)

**Unit – II 15 Hrs**

**2.1 Cell Organelles:-** Structure and functions of Endoplasmic reticulum, Golgi body, Ribosome's, Lysosomes, Mitochondria.

2.2 DNA: Watson & Crick model, Semi Conservative Replication.

2.3 RNA - Structure, types & functions of RNA.

2.4 Chromosomes - Structure, types & functions, Giant Chromosomes (lamp brush & Polytene)

**Unit – III 10 Hrs**

**3.1 Genetics-I:-** Mendel's Laws of Inheritance, Incomplete dominance and co-dominance

**3.2** Lethal alleles, Epistasis, Linkage and crossing over.

**Unit – IV 15 Hrs**

1.1 **Genetics – II** :- Sex determination - Genic balance theory / Bridges theory, Barr bodies.

1.2 Sex linked inheritance.

1.3 Extra chromosomal inheritance (Kappa particles in Paramecium)

1.4 Blood group inheritance.

**Unit – V 10 Hrs**

**5.1 Evolution:-** Origin of life, Hardy - Weinberg Equilibrium, Lamarckism, Darwinism, Neo – Darwinism

5.2 Isolation, Speciation (Allopatric and Sympatric).

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**A.G. & S.G.Siddhartha Degree College of Arts & Science, Vuyyuru – 521165,**

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**Semester - III**

**(Model question paper)**

**w.e.f.2019-2020**

**Title of the paper: Cytology, Genetic & Evolution.Code – Zoo-301C**

**Max. Marks: 70**

**Time: 3hrs.**

**Section – A4 x 5 = 20.**

Answer any **four** questions. Each question carries **Five** marks. Draw neat labeled diagrams wherever necessary.

- 1.Cytoplasam.కణపదార్థము.
- 2.Fluid mosaic model. ద్రవమొజాయిక్ మూనా.
- 3.Golgi body.గాల్జీదేహము.
- 4.Mitochondria.మైటోకాండ్రీయా.
- 5.Crossing Over.వినిమయము.
6. Linkage.సహలగ్నత
- 7.Barr bodies.బార్డేహములు.
- 8.Hardy- Weinberg law.హార్డివెయిన్బర్గ్ నిత్యము.

**Section – B5 x 10 =50.**

Answer any **five** questions. Each question carries **Ten** marks. Draw neat labeled diagrams wherever necessary.

- 9.Describe the ultra structure of Eukaryotic cell?  
యూకారియాటిక్స్ క్షకణనిర్మాణంనువివరింపుము.
- 10.Give an account of structure and functions of Endoplasmic reticulum.  
అంతర్జీవద్రవ్యజాలకంయొక్క నిర్మాణము మరియు విధులనుగూర్చివ్రాయుము.
- 11.Describe the structure and functions of plasma membrane.  
ప్లాస్మాత్వచముయొక్క నిర్మాణము మరియు విధులనుగూర్చివ్రాయుము.
- 12.Explain the structure and types of chromosomes?  
క్రోమోజోముల నిర్మాణము మరియు రకములనుగూర్చివ్రాయుము.
- 13.Describe the Mendel's laws of Inheritance?  
మెండల్ అనువంశికసూత్రములనుగూర్చివివరింపుము.
- 14.Write an essay on Epistasis.  
ఎపిస్టాటిస్మార్చివ్యాసంవ్రాయుము.
- 15.Explain sex determination with the help of Balance theory.  
లింగసంతులనసిద్ధాంతంద్వారాలింగనిర్ధారణనువివరింపుము.
16. Write an essay on Isolation?  
వివక్షతగూర్చివ్యాసంవ్రాయుము.

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Krishna Dt. A.P. (Autonomous)**

**Semester - III**

**Guide lines to the Paper Setter.**

**W.e.f. 2019-2020**

**Title of the paper: Cytology, Genetic & Evolution Code – Zoo-301C**

**Time: 3hrs.**

**Max.marks:70**

1. Answer any **four** questions out of eight in Section .A. Each question carries**five** marks.      4x5=20m.

2. Answer any **five** questions out of eight in Section – B. Each question carries **Ten** marks.      5x10= 50M.

	PART	UNIT-I Cytology I	UNIT-II Cell Organelles	UNIT-III Genetics-I	UNIT-IV Genetics-II	UNIT-V Evolution
<b>5 Marks Questions</b>	<b>A</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>2</b>
<b>10 Marks Questions</b>	<b>B</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>2</b>
<b>Weightage</b>		<b>15</b>	<b>30</b>	<b>15</b>	<b>30</b>	<b>30</b>

**Note:** 1. please provide the scheme of valuation for the paper.

2. Question paper should be both in English and Telugu media.

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**Reference Books :-**

1.A Test Book of zoology: Vikram modern series: E.Chakrapani.

2. Cytology, Genetics &Ecology :P.S.Verma&V.K.Agarwal.

3. Common core –A test Book of Zoology: Sri Vikas Publication : C. Gopal.

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**ZOOLOGY PRACTICAL SYLLABUS**

**PAPER – III**

***Class: II B.Scw.e.f 2019-2020***

***60 Hours/Week : 2***

***Credits: 2***

***Paper Title: Cytology, Genetics & Evolution.External: 25***

***Code : ZOO -301P C***

***Max.Marks:50***

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***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 *Chironomous*

***II. Genetics***

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

***III. Evolution***

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

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**A. G & S. G. S. DEGREE COLLEGE OF ARTS & SCIENCE, VUYYURU 521165,  
KRISHNA Dt., A.P. (AUTONOMOUS)**

**PAPER – III**

**Cytology, Genetics & Evolution** w.e.f.2019-20.

**Model Question paper (External)Max.Marks: 25 M.**

Paper Code: ZOO-301C

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**I.Cytology**

1.Identify, draw neat labeled diagram & notes of the following stages. 2x2  $\frac{1}{2}$ = 5M.

A & B

**II. Genetics**

1.Genetics Problem. 5M.

2.Identify the following Chromosomes & Comment. 2x2  $\frac{1}{2}$ = 5M.

A & B

**III. Evolution**

1.Identify the given pictures and write the Comment. 2x2  $\frac{1}{2}$ = 5M

A & B

2.Identify the given pictures and Comment. 2x2  $\frac{1}{2}$ = 5M

A & B

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**A. G.& S.G. SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE, VUYYURU-521165  
ZOOLOGY PRACTICAL -III**

**(INTERNAL)**

**w.e.f. 2019-2020.**

**(2hrs/week).**

**Cytology, Genetics & Evolution**Code: ZOO-301P.

Max.marks:25M.

Time: 3hrs.

- |                                 |       |      |
|---------------------------------|-------|------|
| 1. Attendance                   | ----- | 5M.  |
| 2. Record                       | ----- | 10M. |
| 3. Field trip & Field note book | ----- | 10M. |

Total ----- 25M.

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**A. G & S. G. S. DEGREE COLLEGE OF ARTS & SCIENCE, VUYYURU 521165,  
KRISHNA Dt., A.P. (AUTONOMOUS)  
PAPER – III**

**Guide lines for the practical Examiner**

Class: II B.Z.C

Paper Title: (Cytology, Genetics & Evolution)

Max.Marks: 25 M.

w.e.f.2019-20.

Paper Code: ZOO-301C

**I.Cytology**

1. Slide A from Mitosis & Slide B Meiosis. 2x2  $\frac{1}{2}$ = 5M.  
( $\frac{1}{2}$  mark for identification, 1 mark for labeled diagram & 1 mark for comments)

**II.Genetics**

2. Checker board 2M.  
Explanation 3M.  
3. Identify & Comment on A& B (From Chromosomes). 2x2  $\frac{1}{2}$ = 5M  
A-Identification – 1 M, Comment – 1 $\frac{1}{2}$  M  
B-Identification – 1 M, Comment – 1 $\frac{1}{2}$  M

**III.Evolution**

4. Identify & Comment on A& B(A- fossil evidence, B – Homology & Analogy) 2x2  $\frac{1}{2}$ = 5M  
A-Identification – 1 M, Comment – 1 $\frac{1}{2}$  M  
B-Identification – 1 M, Comment – 1 $\frac{1}{2}$  M  
5. Identify & Comment on A& B (A- Phylogeny of Horse, B – Darwin's Finches) 2x2  $\frac{1}{2}$ = 5M  
A-Identification – 1 M, Comment – 1 $\frac{1}{2}$  M  
B-Identification – 1 M, Comment – 1 $\frac{1}{2}$  M

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**(Zoology paper-V)**

**Class: III B.Sc (B.Z.C)**

**60 Hrs. (4hrs/week)**

**Credits :3**

**External :75**

**w.e.f.- 2019-2020.**

**paper code:Zoo-501C**

**Title of the paper: Animal Biotechnology**

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**Objective of the course:** To educate students on various biotechnological techniques involve in animal biotechnology, gene manipulations, their role in production of medicines and transgenic animals.

**Course outcomes:**

- ❖ Students are made to become aware of the use of technology that is involved in cloning.
- ❖ Improved quality of species with gene manipulations
- ❖ Recent development in biotechnology that helps for better environment and Production of various monoclonal antibodies and vaccines.
- ❖ Formation of different species - transgenic animals
- ❖ Resistant variety and better yield

**Unit 1:Tools of Recombinant DNA technology - Enzymes and Vectors 15 Hrs.**

1.1.Restriction modification systems : Types I, II and III- Nomenclature, Applications of Type II restriction enzymes in genetic engineering ,DNA polymerases, transferase, kinases and phosphatases,and DNA ligases

1.2 Cloning Vectors:: Properties of Cloning Vectors Plasmid vectors:pBR and pUC 18, Bacteriophage and, Cosmids.Artificial Chromosome Vectors: BACs, YACs,

**Unit 2: Techniques of Recombinant DNA technology 15 Hrs**

2.1 Cloning: Procedure of gene cloning, Use of linkers and adaptors.Microinjection, electroporation, biolistic

method (gene gun). PCR:- Basics of PCR,Principle and Procedure of PCR.

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

2.3 Southern, Northern and Western blotting. DNA finger printing,

**UNIT 3 Animal Cell Technology 10 Hrs.**

3.1 Cell culture media: Natural and Synthetic, Types Cell cultures-: primary culture, secondary culture. Continuous cell lines , Established Cell lines (common examples such as MRC, HeLa,CHO, BHK,

3.2 Cryopreservation of cultures, Hybridoma Technology:- Cell fusion, Production of Monoclonal antibodies (mAb), Applications of mAb

3.3.Stem cells: Types of stem cells- Embryonic and Adult Stem Cells, Diabetes and Parkinson's diseases.

**Unit 4: Reproductive Technologies & Transgenic Animals 10 Hrs**

4.1 Manipulation of reproduction in animals, Artificial Insemination, *In vitro* fertilization.

4.2 Super ovulation, Embryo transfer, Embryo cloning.

4.3 Transgenic Animals- Production of Transgenic Animals- sheep,fish.

**Unit 5: Applied Biotechnology 10 Hrs.**

5.1Industry: Fermentation- Different types of Fermentation. Submerged & Solid state, batch, Fed batch & Continuous (Short notes only)

5.2 Downstream processing - Filtration, centrifugation, chromatography, spray drying ,

5.3 Fisheries : Polyploidy in fishes



SEMESTER-V (Model Question paper )

Paper Title: Animal Biotechnology.

Paper Code : 501C

Answer **any five** questions out of eight in Part - A . Each question carries five marks. **5 X 5 = 25**

**Part – B**

1. Ligases                      లైగేజ్ లు
2. YACYAC
- 3.Southern Blotting              సదరన్ బ్లాటింగ్
- 4.DNA Fingerprinting DNA వేలిముద్రలు
- 5.Applications of mAbmAb      ప్రయోజనాలు
- 6.Polyploidy in fishes          చేపలలో బహుస్థితికత
- 7.Invitrto fertilization          ఇన్ విట్రో ఫలధీకరణ
- 8.Chromatography              క్రోమెటోగ్రఫీ

**Part – B**

Answer **any five** questions out of eight in Part - B .Each question carries Ten marks. **5 X 10 = 50**

9. Write an essay on cloning vectors.  
క్లోనింగ్ వాహకాల గూర్చి వ్యాసము వ్రాయుము.
10. Explain the role of Type II Restriction enzymes in genetic engineering.  
జీవ సాంకేతిక శాస్త్రంలో టైప్ II రెస్ట్రక్షన్ ఎంజైమ్ ల యొక్క పాత్రను గూర్చి వివరింపుము.
11. Define gene cloning .Describe the procedure of gene cloning in detail.  
జన్యు క్లోనింగ్ ను వివరించి ,అది జరుగు విధానమును గూర్చి విపులంగా వ్రాయండి
12. What is PCR. Briefly describe various steps of PCR.  
PCR.అనగా నేమి దానిలోని వివిధ దశల గూర్చి వ్రాయుము.
13. Define Stem Cell Technology ? Briefly describe about it.  
మూలకణ సాంకేతికత అంటే ఏమిటి దాని గూర్చి విపులంగా వ్రాయండి.
14. Write in detail about the transgenic animals.  
వివిధ రకాల కీణ్వణము గూర్చి వ్యాసము వ్రాయుము.
15. Write an essay on different types of fermentation.  
జన్యు పరివర్తక జీవుల గూర్చి వివరించండి.
16. Briefly describe the technology of super ovulation and Embryo transfer in cattle's and discuss their applications and limitations.  
పశువులలో ఉత్తమమైన అండజననము మరియు పిండము ప్రవేశ పెట్టుట వలన ప్రయోజనాలు మరియు వాటి పరిధులు గూర్చి వివరింపుము.

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**SEMESTER-V****Time :3 hrs****Max.Marks:75****Guide lines to the paper setter****Paper Title : Animal Biotechnology****Paper Code : 501C**

*Note :* 1. Answer **any five** questions out of eight in Part-A . Each question carries five marks. 5 X 5 = 25M.

2. Answer **any five** questions out of eight in Part-B . Each question carries 10 marks. 5 X 10 = 50M.

	<b>PART</b>	<b>Unit – I</b>	<b>Unit – II</b>	<b>Unit – III</b>	<b>Unit – IV</b>	<b>Unit – V</b>
<b>5 Marks Questions</b>	<b>A</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>2</b>
<b>10 Marks Questions</b>	<b>B</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>
<b>Weightage</b>		<b>30</b>	<b>30</b>	<b>15</b>	<b>25</b>	<b>20</b>

- Note:**
1. Please provide the scheme of valuation for the paper.
  2. Question paper should be both in English and Telugu media.

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**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.

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## ZOOLOGY PRACTICAL SYLLABUS

### PAPER - V

Periods : 30Max.Marks:50

Credits :2

Code: ZOO-501P

Paper Title : Animal Biotechnology.

1. Genomic DNA isolation from *E. coli*.
2. Plasmid DNA isolation (pUC 18/19) from *E. coli*.
3. Study the following techniques through photographs.
  - a. Southern blotting.
  - b. Western blotting.
  - c. DNA sequencing (Sanger's method)
  - d. DNA finger printing
4. PCR (demonstration) on site or of site demonstration.
5. Project report on animal cell culture.

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A.G & S. G.S.DEGREE COLLEGE OF ARTS & SCIENCE,VUYYURU - 521165, KRISHNA Dt., A.P.  
(AUTONOMOUS)

Animal Biotechnology)  
Model Question Paper ( **External** )

Max. Marks : 25  
Paper Code : ZOO-501P

- 
1. Identify the following Genomic DNA isolation from *E. coli*.5m
  2. Identify the following Plasmid DNA isolation (pUC 18/19) from *E. coli* . 5m
  3. Study the following techniques given on photographs & Write notes on. 2x5=10  
A & B
  4. PCR (demonstration) on site or of site demonstration. 5m

Total: 25m

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A.G & S. G.S.DEGREE COLLEGE OF ARTS & SCIENCE,VUYYURU - 521165, KRISHNA Dt., A.P.  
(AUTONOMOUS)

**Guide lines for the Practical Examiners.**

Class: III B.Z.C  
Paper Title: Animal Biotechnology.  
Max.Marks: 25 M.

w.e.f.2019-20.

Paper Code: ZOO-501C

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1. Identify the following Genomic DNA isolation from *E. coli*.  
( 5 marks for Procedure)
2. Identify the following Plasmid DNA isolation (pUC 18/19) from *E. coli* .  
( 5 marks for Procedure)
3. Study the following techniques given on photographs & Write notes on A & B.  
(1 mark for identification & 4 marks for diagram and notes, for each photographs)
4. PCR (demonstration) on site or of site demonstration.  
( 5 marks for PCR demonstration)

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A.G & S. G.S.DEGREE COLLEGE OF ARTS & SCIENCE,VUYYURU - 521165, KRISHNA Dt., A.P.  
(AUTONOMOUS)

Practical – V  
( Animal Biotechnology )  
Model Question Paper ( Internal )

w.e.f. 2019-20  
Max. Marks : 25  
Paper Code : ZOO-501P

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- |                                 |    |     |
|---------------------------------|----|-----|
| 1. Attendance                   | -- | 5 M |
| 2. Record                       | -- | 10M |
| 3. Field trip & Field note book | -- | 10M |

Total -- 25M

\*\*\*\*\*

**ADUSUMILLI GOPALAKRISHNAIAH & SUGARCANE GROWERS SIDDHARTHA  
DEGREE COLLEGE OF ARTS & SCIENCE, VUYYURU- 521165, KRISHNA Dt., A.P.  
(AUTONOMOUS)**

**SEMESTER - V (CBCS)**

(Zoology paper-VI)

Class: III B.Sc (B.Z.C)

w.e.f.-2017 -18

60 Hrs( 6hrs/ week)

paper code: Zoo-502C

Credits :3

External : 75

Title of the paper: Animal Husbandry. Internal:25

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**Objective of the course:** To help students to stand on their own legs, acquire skills in poultry and Dairy farms and to set up their own firms..

**Course outcomes:**

- ❖ Students are given awareness about different varieties of chicks.
- ❖ Students are familiarized with recent technologies those are applied to produce different species with variations which are more beneficial and income fetching.
- ❖ Students with the help of self help schemes, can set up their own firms, and provide
- ❖ employability to others and to tap the resources of Government and Nongovernmental sectors.
- ❖ They are given managerial and marketing skills as well.

**UNIT – I :**

**10 Hours**

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

**UNIT – II:**

**10 Hours**

- 2.1. Poultry feed management – Principles of feeding. Nutrient requirements for different stages of layers and broilers.
- 2.2. Methods of feeding- Whole grain feeding system, Grain and mash method, All mash method, Pellet feeding.
- 2.3. Poultry diseases – viral, bacterial, fungal and parasitic (two each); symptoms, control and management.

**UNIT – III:**

**10 Hours**

- 3.1 Selection, care and handling of hatching eggs, Egg testing.
- 3.2 Methods of hatching.
- 3.3 Brooding and rearing, Sexing of chicks.

**UNIT- IV:**

**20 Hours**

- 4.1 Breeds of Dairy Cattle and Buffaloes – Definition of breed; Classification of Indian Cattle breeds, exotic breeds and Indian buffalo breeds.
- 4.2 Systems of inbreeding and crossbreeding.
- 4.3 Housing of dairy animals – Selection of site for dairy farm; systems of housing – loose, housing system. Conventional dairy barn

**UNIT - V:**

**10 Hours**

- 5.1 Care and management of dairy animals - Care and management of calf, heifer, milk animal, dry and pregnant animal, bulls and bullocks.
- 5.2 Cleaning and sanitation of programme. Records to be maintained in a dairy farm.

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(AUTONOMOUS)

SEMESTER-V (Model Question paper )

Paper Title : Animal Husbandry

Paper Code : Zoo-502C

Answer **any five** questions out of eight in Part - A . Each question carries five marks. **5 X 5 = 25**

1. Principles of poultry farming. కోళ్ళ పెద్దల్లో పాటించవలసిన ముఖ్యాంశాలు
2. Chick management. కోడి పిల్లల యాజమాన్యము
3. Poultry feed management . కోళ్ళ దాణా యాజమాన్యము
4. Marek's disease. మార్కెస్ వ్యాధి
5. Egg testing (Candle test) గుడ్డును పరీక్షించుట
6. Cleaning and sanitation of Dairy farm. డైరీఫారం యొక్క శుభ్రత మరియు శానిటేషన్
7. Milk record register డైరీఫారంలో నిర్వహించవలసిన రికార్డులు
8. Loose housing system లూజ్ హౌస్ సిస్టమ్

**Part – B**

Answer **any five** questions out of eight in Part - B .Each question carries Ten marks. **5 X 10 = 50**

9. Write an essay on systems of poultry farming  
ఫారాల్లో కోళ్ళను పెంచే వివిధ పద్ధతుల గురించి వ్యాసము వ్రాయుము
10. Write an essay on management of Broilers  
బ్రాయిలర్ కోళ్ళ యాజమాన్య పద్ధతుల గురించి వ్యాసము వ్రాయుము
11. Write an essay on symptoms control and management of two viral and bacterial diseases.  
వైరస్ మరియు బాక్టీరియా వల్ల కలుగు ఏదైన రెండు వ్యాధులు, లక్షణాలు, చికిత్స, నివారణలో యాజమాన్య పాత్ర పై వ్యాసము వ్రాయుము
12. Write an essay on methods of feeding in Poultry  
కోళ్ళకు దాణా పెట్టు పద్ధతులను వివరిస్తూ వ్యాసము వ్రాయుము
13. Write an essay on different methods of hatching eggs  
గ్రుడ్లను పొదిగించే విధానాలను గురించి వ్యాసము వ్రాయుము
14. Give an account of breeds of Indian Cows  
భారతదేశ గోజాతులపై ఒక వ్యాసము వ్రాయుము
15. Explain the vaccination programme in Cattle  
పశువులలో టీకాలు వేయు పద్ధతుల గురించి వివరింపుము
16. write an essay on care and management of Calf, heifer and milk animals  
లేగదూడల, దూడల మరియు పాలిచ్చే పశువులకు తీసుకోవలసిన జాగ్రత్తలు, యాజమాన్య పద్ధతుల పై వ్యాసము వ్రాయుము

**SEMESTER-V****Time :3 hrs****Max.Marks:75****Guide lines to the paper setter****Paper Title : Animal Husbandry.****Paper Code : 502C**

*Note :* 1. Answer **any five** questions out of eight in Part-A . Each question carries five marks.5 X 5 = 25M.

2. Answer **any five** questions out of eight in Part-B . Each question carries 10 marks. 5 X 10 = 50M.

	<b>PART</b>	<b>Unit – I</b>	<b>Unit – II</b>	<b>Unit – III</b>	<b>Unit – IV</b>	<b>Unit – V</b>
<b>5 Marks Questions</b>	<b>A</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>
<b>10 Marks Questions</b>	<b>B</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>
<b>Weightage</b>		<b>30</b>	<b>30</b>	<b>15</b>	<b>30</b>	<b>15</b>

- Note:**
1. Please provide the scheme of valuation for the paper.
  2. Question paper should be both in English and Telugu media.

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**Text Books :-**

1. Animal Husbandry: ---- Technical Test paper.
2. Poultry- Technical Revised Common Core .
3. Animal Husbandry --- Dr.K.Kondaiah, A.V.N.Gupta.

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ZOOLOGY PRACTICAL SYLLABUS

Period : 30

PAPER – VI

Max.Marks:50

Credits :2

Paper Title : Animal Husbandry Paper Code :Zoo-502P

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.

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A.G & S. G.S.DEGREE COLLEGE OF ARTS & SCIENCE,VUYYURU - 521165, KRISHNA Dt., A.P.  
(AUTONOMOUS)

Practical - VI

w.e.f. 2017 - 18

( Animal Husbandry )

Max. Marks : 50

Model Question Paper ( **External** )

Paper Code : ZOO-502P

- |  |                                     |
|--|-------------------------------------|
| 1. Study of various breeds of layers and broilers (photographs)<br>A & B                 | 2X2 <sup>1</sup> / <sub>2</sub> =5M |
| 2. Identification of disease causing organisms in poultry birds (as per theory)<br>A & B | 2X2 <sup>1</sup> / <sub>2</sub> =5M |
| 3. Study of the anatomy of a poultry bird by way of dissecting a bird. (Demonstration)   | 5M                                  |
| 4. Study of various breeds of cattle (photographs/microfilms)<br>A & B                   | 2X5=10M                             |

Total -- 25M

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A.G & S. G.S.DEGREE COLLEGE OF ARTS & SCIENCE,VUYYURU - 521165, KRISHNA Dt., A.P.  
(AUTONOMOUS)

w.e.f.2017-18

**Guide lines for the Practical Examiners.**Max.Marks: 25m

Class: III B.Z.C

Paper Code : ZOO-502C

Paper Title: (Animal Husbandry )

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1. Identify and comment on A & B ( Charts / Photographs).  
( Identification -  $\frac{1}{2}$  mark & Comments -2m )
2. Identify and comment on A & B ( Charts / Photographs  
( Identification -  $\frac{1}{2}$  mark & Comments -2m )
3. Demonstration : ( 4 marks for diagram & 1 marks for labeling)
4. Identify and comment on A & B ( Photographs/ microfilms).  
( Identification -1 mark & Comments -4m )

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A.G& S. G.S.DEGREE COLLEGE OF ARTS & SCIENCE,VUYYURU - 521165, KRISHNA  
Dt., A.P. (AUTONOMOUS)

Practical - VI w.e.f. 2017 - 18

**Animal Husbandry**Max. Marks : 50

Model Question Paper **Internal** Paper Code : ZOO-502P

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1. Attendance	--	5 M
2. Record	--	10M
3. Field trip & Field note book (Any one)	--	10M

Total -- 25M

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