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

# **DEPARTMENT OF ZOOLOGY**

# 2018-2019



# **BOARD OF STUDIES**

# **Minutes of Meeting**

09-04-2018

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 09-04-2018 in the Department of Zoology.

 Smt.D.A. Kiranmayee.
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 Presiding

 Members Present:
 ....
 ....
 Chair person

 1)
 ......
 Members Present:
 Chair person

 Smt. D.A.Kiranmayee.
 Ultrain
 Chair person

2)..... University Nominee

(Prof.B.V.Sandeep.)

(Smt. D.Uma.)

3).....

Academic Council Head

Nominee

Head, Department of Zoology, S.D.M.S.College,(Autonomous) Vijayawada.

Head, Department of Zoology,

ProfessorDept. of Zoology, Andhra University,

Vizag

A.G&S.G.S Degree College of

Vuyyuru-521165.

4). Ch. Ch. Ch. Cademic Council (Sri.Ch.Venkateswarlu.) Nominee

Head, Department of Zoology, P.B. Siddhartha College, Vijayawada.

5). M. L. Pre parka april 8 (kum. M. Lakshmi Privanka.) Member

Lecturer in Zoology, A.G& S.G.S Degree College of Vuyyuru-521165.

### Agenda for B.O.S Meeting.

1. To recommend the syllabi (Theory & Practical), Model question paper for Semesters I & II of IB.Sc (BZC) in the academic year 2018-19.

2. To recommend the syllabi (Theory & Practical), Model question paper ,for III & IV Semesters of II B.Sc(BZC) for the academic year 2018-19.

3. To recommend the syllabi (Theory & Practical), Model question paper for V & VI Semesters of III B.Sc(BZC) for the academic year 2018-19.

4. To discuss to the syllabus of Elective& Clusters in VI semester for the academic year 2018-19.

5. To recommend the Guide lines to be followed by the question papers setters in Zoology for I,II,III,IV,V&VI Semester –End exams.

6. To recommend the teaching and evaluation methods to be followed under Autonomous status

7. Any other matter.

D. A. Wummayee

Chairman.

# **RESOLUTIONS**

1. It is resolved to continue the same syllabi (Theory & Practical), and model question paper forZoology I& II semesters of I B.Sc. (B.Z.C) under Choice Based Credit System (CBCS) approved by the Academic Council of 2018 – 19.

2. It is resolved to implement the same syllabi (Theory & Practical), model question paper under Choice Based Credit System (CBCS) setters of Zoology of III & IV semesters of II B.Sc. (B.Z.C) ..

3. 4. It is Resoled to follow Elective-A (Immunology) and Cluster –B (Aquaculture) in VI Semester from the Academic year 2018-19.

5.It is resolved to Continue the same Blue prints and guidelines for the paper setters of I,II,III,IV,V & VI Semesters of B.Sc Zoology for the Academic year 2018-19.

6. It is resolved to continue the following teaching and evalution methods for the Academic year 2018-19.

7. It is resolved to conduct Certificate Course in Organic farming for BA, B.Com and B.Sc. students. <u>Teaching methods:</u>

Besides the conventional methods of teaching, we use modern technology using of LCD projector to display on U boards etc; for better understanding of concepts.

# Evaluation of a student is done by the following procedure

- There are two components in the Valuation and Assessment of a student Internal Assessment (IA) and Semester Examinations (SE).
  - (For the Batch of Students Admitted from 2018-2019 UG)

# Internal Assessment (IA)

- > The maximum mark for IA is 30 and SE is 70 for theory; and for practical papers 50.
- Each IA written examination is of 1 hour's duration for 20 marks. The tests will be conducted centrally. The average of two such IA is calculated for 20 marks.
- Other Innovative Components will be for 5 Marks. The innovative component is for 5 marks, conducted during the class hours by the staff member/ in charge of the subject, in the form of assignments/ quiz/ seminars /ppt/Online- assignments/Open Book/Viva Voce/ Group work/ Mini Project/ Exhibition, etc. The topic and time for submission/ presentation will be announced by the staff member/ in charge of the subject in advance. Each student should explain and defend his/her presentation. For attendance 5 Marks are allotted.
- $\blacktriangleright$  The semester examination will be of 3 hours with maximum 70 marks.
- > There is no pass minimum for IA.

# Semester Examinations (SE)

- A student should register himself/herself to appear for the Semester Examinations by payment of the prescribed fee.
- The Semester Examinations will be in the form of a comprehensive examination covering the entire syllabus in each subject. It will be of 3 hours duration & Foundation course 2 hours irrespective of the number of credits allotted to it.
- If a candidate fails to obtain pass marks even after the due to less mark in the IA examination, the marks of the next examination will be converted to be out of 100.

- Even though the candidate is absent for two IA exams/obtain zero marks the external marks are considered (if he/she gets 40/70) and the result shall be declared as 'PASS'
- > The maximum marks for each Paper shall be 100.

# **Evaluation of a student is done by the following procedure:**

### I. Internal Assessment Examinations:

- Out of maximum 100 marks in each paper, 25 marks shall be allocated for internal assessment.
- Out of these 25 marks, 15 marks are allocated for announced tests. Two announced tests will be conducted and average of these two tests shall be deemed as the marks obtained by the student, 5 marks are allocated on the basis of candidate's percentage of attendance, 5 marks for semenars& remaining 5 marks for assignments to the Semesters I,II, III & IV. For the V & VI semesters it is resolved to continue the same as approved by Academic Council in 2014 -15.

# II. Semester-End Examinations:

- The maximum marks for I,II,& III B.Sc Semester-End examinations shall be 75 marks and duration of the examination shall be 3 Hours.
- Semester-End examinations shall be conducted in theory papers at the end of every semester while in practical papers, these examinations are conducted at end of I, II, III, IV & VI semesters.
- Discussed and recommended for organizing Seminars, Guest lectures, Work-shops to upgrade the knowledge of students, for the approval of the Academic Council.

D. A. (civunnayee\_

Chairman

# ZOOLOGY

## PAPER-I

IB.Sc. Credits : 3

Title of the paper: Biology of Non – Chordates.

# **UNIT-I**

<u>Semester – I</u> w.e.f. 2017 – 2018 (Code: Zoo-101C) Max.Marks: 75 60 hrs.(4hrs/week)

10hrs

1.1: Significance of Diversity of Invertebrates.

# 1.2: Phylum - Protozoa :

1.2.1: Type study: Elphidium.

# 1.3: Phylum - Porifera :

1.3.1: Type study: Sycon - Morphology, histology, spicules.

1.3.2: Canal system in Sponges.

#### UNIT-I 16hrs.

# 2.1 Phylum - Coelenterata :

2.1.1: Type study :Obelia - Morphology, Structure of Polyp & Medusa.

2.1.2: Polymorphism in Coelenterates.

2.1.3: Coral & Coral reef formation.

# 2.2 **Phylum- Platy helminthes:**

2.2.1: Type study: Fasciola hepatica – Morphology, Excretory system, Reproductive system, Life history & Pathogenecity.

# 23Phylum - Nemathelminthes:

2.3.1: Type study: Ancylostomaduodenale - Morphology & Life history.

#### 10 hrs. UNIT-III

# 3.1 Phylum - Annelida:

3.1.1:Type study: Hirudinaria granulose – Morphology, Digestive system, Excretory system & Reproductive system.

- 3.1.2: Coelome&Coelomoducts.
- 3.1.3: Vermiculture: Scope, Significance of Vermiculture, Earthworms Sps, Processing of Vermiculture, Vermicompost, and Economic Importance of Vermicompost.

# UNIT-IV 15hrs.

# 4.1: Phylum - Arthropoda :

4.1.1: Type study : Prawn – External characters [Except appendages], Respiratory system & Circulatory system.

4.1.2: Peripatus : Structure & affinities.

# 4.2: Phylum - Mollusca:

4.2.1 Pearl Formation in Pelecypoda.

4.2.2 : Torsion in Gastropoda.

# UNIT- V9hrs.

# **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

Reference Books :-	
<ol> <li>Modern Text Book of Zoology InvertebratesR.L.Kotpal</li> <li>A Text Book of Invertebrates Arumugam et</li> <li>Economic Zoology Saras Publication</li> </ol>	t.al., tion
A.G. &S.G.Siddhartha Degree College of Arts & Science, Vuyy	vuru –Autonomous)
Semester - I	
Zoology – I (Mode	el question paper)
Code – Zoo-101CTitle of the paper:Biology of Non – Chords	ates.
Time : 3hrs.	Max. Marks : 75.
<u>Section – A</u>	<b>5 x 5= 25.</b> Answer any
fivequestions. Each question carriesfivemarks. Draw neat labeled diagram1.2.3.4.5.6.7.8.Section - B5 x 10=50.Answer any fivequestions. Each question carriesTenmarks. Draw neat labelednecessary.9.10.11.12.13.14.15.16.	ns wherever necessary.

# A.G. & S.G. Siddhartha Degree College of Arts & Science, Vuyyuru,(Autonomous) Semester – I

Zoology –	I
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	Guide lines to the Paper Setter	Title of the paper:
<b>Biology of Non – Chordates.</b>	Code – Zoo-101C	
Time : 3hrs.		Max. Marks : 75.

**Note :**1. Answer any <u>five</u> questions out of eight in Section – A

Each question carries <u>**five**</u> marks5x5 = 25M.

2. Answer any **five** questions out of eight in Section – B. Each question carries Ten marks.

5x10= 50M.

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

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

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

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

w.e.f. 2017-2018.Code :Zoo- 101P MAX.MARKS : 50. (2hrs/week) Biology of Non – Chordates.

granulosus

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

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.

 $\Box$  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.** 

### A. G.& S.G. SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE, VUYYURU-521165

### **EXTERNAL PRACTICAL-I**

Biology of Non – Chordates. w.e.f. 2017-2018.		
(3 hrs/week) MODEL QUESTION PAPER -I Credits: 2.	Code: ZOO-101P	
Time: 3 hrs.	Max.marks: 2	5m.
I. Draw neat labeled diagram of Digestive system of Leech.		6M.
II .Draw neat labeled diagram of Radula of Pila.		4M.
III. Spotters: Identify, draw labeled diagram & write notes on		
A, B, C, D	4X3=12M	
<b>1.</b> Viva.		3M

TOTAL:25M.

# **Guide lines for the practical Examiners**

I.List of dissections: (8 marks 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 & 3Marks for notes for each spotter.

Invertebrates: 4 specimens / slides / models.

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A. G.& S.G. SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE, VUYYURU-521165

Biology of Non- Chordates Internal Practical ICode: ZOO-101P.

## **MODEL QUESTION PAPER -II**

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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# ADUSUMILLI GOPALKRISHNAIAH & SUGARCANE GROWERS SIDDHARTHA DEGREE COLLEGE

# OF ARTS & SCIENCE (AUTONOMOUS), VUYYURU - 521165, KRISHNS Dt., A.P.

# ZOOLOGY

SEMESTER - II

	w.e.f 2017 - 18
I B.Sc BZC	( Code : ZOO -201 C)
No. of Hours per week : 4	Max.Marks: 70
Credits : 3	Pass Mark : 28
Title of the Paper : Biology of Chordates	
UNIT I15hrs	
1.1. Prochordata	
1.1.1. Structure of Branchiostoma	
1.1.2.Affinities of Cephalochordata	
1.1.3.Structure and Life History of Herdmania	
1.1.4.Significance of Retrogressive metamorphosis	
UNIT II	15hrs
2.1.Cyclostomata	
2.2 Diseas	
2.2.1.Scollodon- External features, Digestive System, Respiratory System	m, Heart, Brain
2.2.2.Migration in Fishes	
2.2.3.Dipnoi	
	10hrs.
3.1.Amphibia	
3.1.1.Ranahexadactyla - External features, Digestive System, Respirator	y System, Heart, Brain
3.1.2.Parental care in Amphibians	
3.2.Reptilia	
3.2.1.Calotes - External features, Digestive System, Respiratory System,	Heart, Brain
UNIT	IV
12hrs	
4.1. Aves	
4.1.1.Columbalivia - Exoskeleton, Digestive System, Respiratory System	m, Heart, Brain
4.1.2. Migration in Birds	
4.1.3.Flight adaptations in Birds	
	8hrs
5.1.Mammalia	
5.1.1. Differences between Prototheria & Metatheria.	
5.1.2. Denution in Mammais.	

A.G. &S.G.Siddhartha Degree College of Arts & Science, Vuyyuru – 521165				
Krishna Dt. A.P.	(Autonomous)			
	Semester - I			
Zoology – I	Code – Zoo-201CTitle of the paper:Biol	(Model question paper) ogy of Chordates.		
Time: 3hrs.		Max. Marks: 70.		
	<u>Section – A</u>	$5 \ge 4 = 20.$		
Answer any <u>five</u> question	ons. Each question carries <b>four</b> marks. Draw nea	t labeled diagrams wherever necessary.		
1. 2. 3. 4. 5. 6. 7. 8.				
<u>Section – B</u>	5 x 10 =50.			
Answer an <u>y <b>five</b></u> question 9.	ons. Each question carries <u><b>Ten</b></u> marks. Draw neat	a labeled diagrams wherever necessary.		
10.				
11.				
12.				
13.				
14.				

15.

16.

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

# Semester – I

# Zoology – I

# **Guide lines to the Paper Setter**

Title of the paper: Biology of Chordates. Code – Zoo-201C

Time: 3hrs.

## Max. Marks: 70.

**Note:**1. Answer any <u>five</u> questions out of eight in Section – A. Each question carries <u>four</u> marks. 5x4 = 20M.

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

	Section	<b>UNIT-I</b> prochordata	<b>UNIT-II</b> Cyclostomata &Pisces	UNIT-III Amphibia & Reptilia	UNIT-IV Aves	<b>UNIT-V</b> Mammalia
4 Marks Questions	Α	1	2	2	2	1
10 Marks Questions	В	1	2	2	2	1
Weightage		14	28	28	28	14

**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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### **PRACTICAL - II**

w.e.f. 2017 - 2018	
I B.Sc	Code : ZOO - 201P C
Hours / Week: 3	Max. Marks: 50
Credits: 2	External : 25
PAPER TITLE:	BIOLOGY OF CHORDATES

**Observation of the following slides / specimens / models: Protochordata: Salient features of Urochordata & Cephalochordata.** Herdmania, Amphioxus, Amphioxus T.S. through pharynx.

**Cyclostomata** : General Characters of Cyclostomes. Petromyzon, Myxine.

**Pisces** : General Characters & Classification upto Sub- Class level. Pristis, Torpedo, Channa, Pleuronectes, Hippocampus, Exocoetus, Echeneis&Labeo **Types of Scales**: Placoid scale, Cycloid scale, Ctenoid scale.

**Amphibia** : General Characters & Classification upto Order level. Ichthyophis, Amblystoma, Siren, Hyla, Rachophorus, Axolotl larva.

Reptilia : General Characters & Classification upto Order level. Draco,Chamaeleon,Uromastix,Russelsviper, Naja, Bungarus,Enhydrina& Testudo.

Aves :General Characters & Classification upto Sub- Class level. Passer, Psittacula, Bubo, Alcedo, Columba, Corvus, Pavo.

**Mammalia** : General Characters & Classification upto Sub- Class level. Ornithorthynchus, Tachyglossus, Pteropus, Funambulus, Manis, Loris, Hedgehog.

**Osteology** : Appendicular skeletons of Varanus , Pigeon, Rabbit – Skull, Fore limbs, Hind limbs

### Demonstration of dissection / dissected / virtual dissection:

- 1. V, VII, IX, X Cranial nerves of shark / locally available fishes.
- 2. Arterial system, venous system of Shark / Calotes / Fowl / Rat.
- 3. Digestive system of fish.
- Laboratory record work shall be submitted at the time of practical examination
- Compulsory one species to be adopted for demonstration only by the faculty

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# A. G.& S.G. SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE, VUYYURU-521165 EXTERNAL PRACTICAL- II

w.e.f. 2017-2018.

DIULUGI UF CHURDAIES 5 hrs/week)		
MODEL QUESTION PAPER -II	Code: ZOO-201P	
	Credi	its: 2.
Time: 3 hrs.		Max.marks: 25m.
3. Draw neat labeled diagram of IX &X Cran	ial nerves of Shark.	7M
4. Spotters: Identify , draw labeled diagram &	& write notes on	
A, B, C, D & E	5X3=15M	
<b>5.</b> Viva.		3M
TOTAL:		25M.

# Guide lines for the practical Examiners

List of dissections :( 5marks for diagram & 2 marks for labeling)

- 1. V, VII, IX, X Cranial nerves of shark/ locally available fishes.
- 2. Arterial system, venous system of shark/ Calotes/Fowl/Rat.
- 3. Digestive system of fish.

Spotters: 1Mark for identification, 1 Mark for labeled diagram & 1 Mark for notes for each spotter. Chordata: 4 Specimens / Slides / Models

(Prochordates, Fishes, Amphibians, Reptiles, Birds&Mammals) **Bone -1.** 

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### A. G.& S.G. SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE, VUYYURU-521165 INTERNAL PRACTICAL- II BIOLOGY OF CHORDATES w.e.f. 2017-2018.

(3 hrs/week).

Code: ZOO-201P. **MODEL QUESTION PAPER -II** Max.marks:25M. Time: 3hrs.

- 1. Attendance ----- 5M.
- 2. Record ------ 10M.

3. Project (Earn while you learn) -----10M.

Total ----- 25M.

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

### **SEMESTER - III**w.e.f. - 2017 - 18

Class: II B.Sc (B.Z.C) Max.Marks: 100 Credits: 4 Paper Code: ZOO -301C 60 Hrs (4hrs/ week)

External :75

Title of the Paper : Cytology, Genetics and Evolution. Internal :25

## Unit – I (Cytology-I)

1.1Cytology - I

1.1.1 Electron microscopic structure of cell

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

# Unit – II (Cell Organelles)

2.1 Cell Organelles

2.1.1. Stricture and functions of Endoplasmic reticulum.

2.2.2. Stricture and functions of Golgi body.

2.3.3. Stricture and functions of Ribosome's.

2.4.4. Stricture and functions of Lysosomes.

2.5.5. Stricture and functions of Mitochondria.

2.6.6. Chromosomes - Structure, types & functions

### Unit – III (Genetics-I)

3.1 Genetics-I

3.1.1. Mendel's Laws of Inheritance.

3.1.2. Incomplete dominance and co-dominance

3.1.3. Lethal alleles, Epistasis

3.1.4. Linkage and crossing over

# Unit – IV (Genetics-II)

4.1 Genetics - II

4.1.1. Sex determination (Male hetero & female homogametic, female hetero & male, homogametic type, Haplo – Diploid, Genic Balance Theory, Barr bodies.

4.1.2 .Sex linked inheritance (X – linked, Y – linked & XY – linked inheritance. Sex – limited and Sex influenced inheritance.

4.1.3. Extra chromosomal inheritance (Kappa particles in Paramecium)

# Unit – V (Evolution)

5.1.Evolution5.1.1. Origin of life.

5.1.2. Hardy – Weinberg Equilibrium.

5.1.3. Lamarckism, Darwinism, Neo – Darwinism.

5.1.4. Isolation.

5.1.5. Speciation (Allopatric and Sympatric).

# **Reference Books:**

1. Cell Biology, C	enetics & Evolution	P.S Varama& V.K Agarwal
2.Cell & Molecula	ır Biology	Mohan P. Arora,
3. Cell Biology	••••••	S.C.Rastogi,
4. Genetics		Dr. R. P. Meyyan& P.K. Gupta

# A.G. &S.G.Siddhartha Degree College of Arts & Science, Vuyyuru – 521165, Krishna Dt. A.P. (Autonomous) <u>SEMESTER - III</u>

Time: 3hrs.

# MODEL QUESTION PAPER

# Section $-A \ 5 \ x \ 5 = 25$ .

Answer any <u>five</u> questions. Each question carries <u>Five</u> marks. Draw neat labeled diagrams wherever necessary.

1.Cytoplasam.కణపదార్థము.
 2.Fluid mosaic model. ద్రవమొజాయిక్నమూనా.
 3.Golgi body.గాల్గిదేహము.
 4.Mitochondria.మైటో కాండ్రియా.
 5.Crossing Over.వినిమయము.
 6. Linkage.సహలగ్నత
 7.Barr bodies.బార్డేహములు.
 8.Hardy- Weinberg law.హార్డివెయినృర్ధ్పాతము.

### Section – B

### 5 x 10 =50.

Answer any <u>five</u> questions. Each question carries <u>Ten</u> marks. Draw neat labeled diagrams wherever necessary.

9.Describe the ultra structure of Eukaryotic cell?

యూకారియాటిక్సూక్ష్మకణనిర్మాణంనువివరింపుము.

10. Give an account of structure and functions of Endoplasmic reticulum.

అంతర్జీవద్రవ్యజాలకంయొక్కనిర్మాణముమరియువిధులనుగూర్చిద్రాయుము.

11.Describe the structure and functions of plasma membrane.

ప్లాస్మాత్వచముయొక్కనిర్మాణముమరియువిధులనుగూర్చివ్రాయుము.

12.Explain the structure and types of chromosomes?

్రకోమోజోములనిర్మాణముమరియురకములనుగూర్చివ్రాయుము.

13.Describe the Mendel's laws of Inheritance?

మెండల్ అనువంశికసూత్రములనుగూర్చివివరింపుము.

14. Write an essay on Epistasis.

ఎపిస్టాటిస్తూర్చివ్యాసంద్రాయుము.

15.Explain sex determination with the help of Balance theory.

లింగసంతులనుసిద్ధాంతంద్వారలింగనిర్థారణనువివరింపుము.

16. Write an essay on Isolation?

వివక్తతగూర్చివ్యాసంవ్రాయుము.

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# A.G. & S.G. Siddhartha Degree College of Arts & Science, Vuyyuru – 521165, Krishna Dt. A.P. (Autonomous) Semester - III Guide lines to the Paper Setter Cytology, Genetic & EvolutionCode – Zoo-301C

### Time: 3hrs.

1. Answer any <u>five</u> questions out of eight in Section .A. Each question carries five marks. 5x5=25m.

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

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

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

# Periods: 24Max.Marks:50 Paper Title: Cytology, Genetics & Evolution. Code: ZOO 301P

# 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

# MODEL QUESTION PAPER EXTERNAL PRACTICAL –III

# Cytology, Genetics & EvolutionCode: ZOO-301P.

I. CytologyMax.marks:25M	
1. Identify, draw neat labeled diagram & notes of the following stages.	$2x2^{n} = 5M.$
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	
	Total=25M

### \*\*\*\*\*

# INTERNAL PRACTICAL

### Max.marks:25M. Time: 3hrs.

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

otal----- 25M.

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

### **SEMESTER - IVw.e.f. -** 2017 - 18

Class :II B.Sc (B.Z.C)Paper Code : ZOO -401C

Credits : 4

Max.Marks: 100

60 hrs. (4hrs/week) Internal:25 **Warks**. 100

External: 75

Title of the Paper: Embryology, Physiology and Ecology.

### Unit – I (Embryology)

### 1.1 Developmental Biology and Embryology

- 1.1.1 Gametogenesis (Spermatogenesis, Oogenesis)
- 1.1.2 Fertilization
- 1.1.3 Types of eggs
- 1.1.4 Types of cleavages

1.2 Development of Frog upto formation of Primary germ layers.

1.3 Foetal membranes in Chick

1.4Development - types and functions of Placenta in mammals

# Unit – II (Physiology - I )

### 2.1 Physiology - I

2.1.1 Elementary study of digestive process

2.1.2 Absorption of digested food

- 2.1.3 **Respiration** Structure of mammalian Lung & Mechanism of respiration , transport of oxygen and carbon dioxide
- 2.1.4 Circulation Structure and functioning of heart, Cardiac cycle
- 2.1.5 Excretion Structure of nephron, urine formation, counter current mechanism

# Unit – III (Physiology - II )

### 3.1 Physiology - II

- 3.1.1 Structure & functional properties of Nerve Cell, Production & propagation of nerve impulse Resting potential & Action Potential, Synaptic transmission.
- 3.1.2 Muscle contraction Ultra structure of muscle fibre, molecular and chemical basis of muscle contraction.
- 3.1.3 Endocrine glands Structure, secretions and the functions (of hormones) ofpituitary, thyroid, parathyroid, adrenal glands and pancreas.
- 3.1.4 Hormonal control of reproduction in Mammals.

# Unit – IV (Ecology – I)

### 4.1 Ecology - I

- 4.1.1 Abiotic factors of Ecosystem Temperature & Light.
- 4.1.2 Nutrient cycles Nitrogen, Carbon and Phosphorus.
- 4.1.3 Components of Ecosystem (Example: lake), food chains and food web, energy flow in ecosystem.

### Unit – V (Ecology - II, Zoogeography)

5.1 Ecology - II

5.1.1 Habitat and ecological niche.

5.1.2 Community interactions - Mutualism, commensalism, parasitism.

5.1.3 Ecological succession.

# 5.2 Zoogeography

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

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# A. G & S. G. S Degree College Of Arts &Science,Vuyyuru 521165, Krishna Dt., A.P. (Autonomous)

# **SEMESTER- IV** (Model Question paper)

Time :3 hrs

### Max.Marks:75

# <u>Part – A</u>

Answer <u>any five</u> questions out of eight in Section-A . Each question carries five marks.  $5 \times 5 = 25$ 

1. 2. 3.

4.

5.

6.

7.

8.

# Part – B

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

9. 10.

11.

12.

13.

14.

15.

16.

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### A. G & S. G. S Degree College Of Arts &Science,Vuyyuru 521165, Krishna Dt., A.P. (Autonomous) SEMESTER-IV

# Time :3 hrs

# Max.Marks:75

# **Guide lines to the paper setter**

Note :1. Answer <u>any five</u> questions out of eight in Section-A . Each question carries five marks.  $5 \times 5 = 25M$ .

2. Answer **any five** questions in Section-B . Each question carries 10 marks.  $5 \times 10 = 50$  M.

	Sectio n	<b>Unit – I</b> Embryology	<b>Unit – II</b> Physiology - I	<b>Unit – III</b> Physiology - II	<b>Unit – IV</b> Ecology-I	Unit – V Ecology - II, Zoogeography
5 Marks Questions	A	2	1	2	1	2
10Marks Questions	В	2	2	1	1	2
Weightage		30	25	25	15	30

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

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

### ZOOLOGY PRACTICAL SYLLABUS - SEMESTER - IV

### ZOOLOGY - PAPER - IVw.e.f: 2017-18

Max. Marks : 50 Paper Code: 401P

Periods: 24 **Title**:Embryology, Physiology and Ecology

# 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 embryo 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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# A. G.& S.G. SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE, VUYYURU ZOOLOGY PRACTICAL -IV Embryology,Physiology & Ecology Model question paper (External) Paper Code: ZOO-401C

Max.Marks: 25 M.

### I.Embryology:

1. Identify, draw neat labeled diagram & comment on . $1^{\frac{1}{2}}x 2 = 3M$ .A &BII. Physiology2. Identify, draw neat labeled diagram & comment on . $1^{\frac{1}{2}}x 2 = 3M$ .A & B3. Identify the organic substances in the given samples A & B, each with two tests.

 $4x 1^{\frac{1}{2}} = 6M.$  (Sample A- 2X2  $\frac{1}{2} = 5$  Marks & sample B -- 2X2  $\frac{1}{2} = 5$  Marks)

4. Identify the Excretory products in the given samples A & B, each with two tests.  $4x 1^{\frac{1}{2}} = 6M$ .

(Sample A-  $2X2 \frac{1}{2} = 5$  Marks & sample B --  $2X2 \frac{1}{2} = 5$  Marks)

### III. Ecology:

- 5. Determine the pH of given sample. 1x2=2M.
- 6. Estimate the dissolved oxygen in the given sample. 1x5=5M.

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### ZOOLOGY PRACTICAL -IV INTERNAL

**Embryology,Physiology& Ecology**Code: ZOO-401P. Max.marks:25M

Time: 3hrs.

1.	Attendance	 5M.
2.	Record	 10M
3.	Assignment	 10M

Total ----- 25M.

### ADUSUMILLI GOPALAKRISHNAIAH & SUGARCANE GROWERS SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE, VUYYURU- 521165, KRISHNA Dt., A.P. (AUTONOMOUS) <u>SEMESTER - V</u> (CBCS)

(Zoology paper-V)

Class: III B.Sc (B.Z.C) 60 Hrs.(6hrs/week) Credits :3 BiotechnologyInternal:25

paper code:Zoo-501C External :75

w.e.f.- 2017-18

Unit 1: Tools of Recombinant DNA technology - Enzymes and Vectors 15 Hrs. 1.1 Restriction modification systems : : Types I, II and III- Nomenclature, Mode of action. 1.1.2: Applications of Type II restriction enzymes in genetic engineering 1.2 DNA modifying enzymes and their applications: 1.2.1: DNA polymerases, Terminal deoxynucleotidyl transferase, kinases and phosphatases, and DNA ligases 1.3 Cloning Vectors: 1.3.1 : Properties of Cloning Vectors 1.3.2: Plasmid vectors:pBR and pUC 18, Bacteriophage lambda and M13 based vectors, Cosmids. 1.3.3: Artificial Chromosome Vectors: BACs, YACs, **Unit 2: Techniques of Recombinant DNA technology** 15 Hrs. 2.1 Cloning: 2.1.1: Procedure of gene cloning 2.1.2: Use of linkers and adaptors 2.2 Gene delivery: 2.2.1 :Microinjection, electroporation, biolistic method (gene gun), Calcium method. 2.3 PCR: 2.3.1: Basics of PCR: Definition, Principle and Procedure of PCR. 2.4 DNA Sequencing: 2.4.1: Sanger's method of DNA sequencing- traditional and automated sequencing 2.4.2:DNA finger printing. 2.5 Hybridization techniques: 2.5.1: Southern, Northern and Western blotting. 2.6 Genomic and cDNA libraries: 2.6.1: Preparation and uses **UNIT 3 Animal Cell Technology** 10 Hrs. 3.1 Cell culture media: 3.1.1: Natural and Synthetic 3.2 Types Cell cultures: 3.2.1: primary culture, secondary culture, 3.2.2: Protocols for Primary Cell Culture 3.2.3: Continuous cell lines, Established Cell lines (common examples such as MRC, HeLa, CHO, BHK, Vero) 3.2.4: Cryopreservation of cultures. 3.3 Hybridoma Technology: 3.3.1: Cell fusion, Production of Monoclonal antibodies (mAb) 3.3.2: Applications of mAb 3.4 Stem cells: 3.4.1: Types of stem cells- Embryonic and Adult Stem Cells 3.4.2: Applications of Stem Cell Technology in Cell based therapy- Diabetes and Parkinson's diseases. **Unit 4: Reproductive Technologies & Transgenic Animals** 10 Hrs. 4.1 Manipulation of reproduction in animals: 4.1.1: Artificial Insemination, In vitro fertilization . 4.1.2: super ovulation, Embryo transfer, Embryo cloning 4.2 Transgenic Animals: 4.2.1: Production of Transgenic Animals- sheep, fish **Unit 5: Applied Biotechnology** 10 Hrs. 5.1 Industry: **5.1.1:**Fermentation: Different types of Fermentation. 5.1.2: Submerged & Solid state, batch, Fed batch & Continuous (Short notes only) 5.1.3: Downstream processing - Filtration, centrifugation, extraction, chromatography, spray drying and lyophilization 5.2 Fisheries : 5.2.1: Polyploidy in fishes

# **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. ElsevierAcademic 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. ColdSpring 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.

### A.G& S.G.S.DEGREECOLLEGE OF ARTS & SCIENCE, VUYYURU (AUTONOMOUS)

### **SEMESTER-V** (Model Question paper )

### Paper Title : Animal BiotechnologyPaper Code : 501C

Answer <u>any five</u> questions out of eight in Part - A. Each question carries five marks.  $5 \times 5 = 25$ 

2. 3. 4. 5. 6. 7. 8.

# Part – B

Answer <u>any five</u> questions out of eight in Part - B .Each question carries Ten marks.  $5 \times 10 = 50$ 

9.

1.

- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.

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

### **SEMESTER-V**

Time :3hrs

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 = 25M.

2. Answer <u>any five</u> questions in Part-B. Each question carries 10 marks.  $5 \times 10 = 50M$ .

	PART	Unit – I	Unit – II	Unit – III	Unit – IV	Unit – V
5 Marks Questions	Α	2	2	1	1	2
10 Marks Questions	В	2	2	1	2	1
Weightage		30	30	15	25	20

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

### ZOOLOGY PRACTICAL SYLLABUS

### PAPER - V

Periods : 30Max.Marks:50 Credits :2 Title : Animal Biotechnology

Code: ZOO-501P Paper

- 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

### Guide lines for the Practical Examiners.

- 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 PCRdemonstration)

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

Practical - V	w.e.f. 2017 - 18	
( Animal Biotechnology )	Max. Marks : 25	
Model Question Paper (External)	Paper Code : ZOO-50	)1P
1. Identify the following Genomic DNA isolation from <i>E. coli</i> .	5m	
2. Identify the following Plasmid DNA isolation (pUC 18/19) from	n <i>E. coli</i> . 5m	
3. Study the following techniques given on photographs& Write no	tes on. $2x5=10m$	
A & B		
4. PCR (demonstration) on site or of site demonstration.	5m	
Total:	25m	
A.G& S. G.S.DEGREE COLLEGE OF ARTS & SCIENC KRISHNA Dt., A.P. (AUTONOMOU	CE,VUYYURU - 521165 JS)	5,

Practical - V	w.e.f. 2017 - 18
( Animal Biotechnology )	Max. Marks : 25
Model Question Paper (Internal)	Paper Code : ZOO-501P

1. Attendance		5 M
2. Record		10M
3. Field trip & Field note book		10M
	Total	25M

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

### **SEMESTER - V** (CBCS)

(Zoology paper-VI)

w.e.f.-2017-18

paper code:Zoo-502C External: 75Title of the Paper: Animal Husbandry.

### UNIT -I:

Credits :3

Internal:25

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

60 Hrs( 6hrs/ week)

1.1 General introduction to poultry farming.

1.2 Principles of poultry housing. Poultry houses.

1.3 Systems f poultry farming.

1.4 Management of chicks, growers, layers, and Broilers.

### UNIT – II:

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:

3.1 Selection, care and handling of hatching eggs.

3.2 Egg testing.

3.3 Methods of hatching.

3.4 Brooding and rearing.

3.5 Sexing of chicks.

### **UNIT-IV:**

20 Hours

**10 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:

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.

10 Hours

# **10 Hours**

**10 Hours** 

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

### **SEMESTER-V** (Model Question paper )

Paper Title : Animal Husbandry

Paper Code : Zoo-502C

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

1.
 2.
 3.
 4.
 5.
 6.
 7.

8.

# <u> Part – B</u>

Answer <u>any five</u> questions out of eight in Part - B .Each question carries Ten marks.  $5 \times 10 = 50$ 

- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.

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

### **SEMESTER - VI**

### ZOOLOGY -ELECTIVE PAPER: VII-(A)

Class: III B.Sc (B.Z.C) 60 Hrs. Credits :3 Immunology w.e.f.- 2017- 18 Paper code: Zoo- 601-A(El) Internal:25

### Unit – I

### 1.1 Overview of Immune system

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

### 1.2 Cells and organs of Immune system

- 1.2.1 Cells of immune system
- 1.2.2 Organs of immune system

Unit – II

### 2.1 Antigens

2.1.1 Basic properties of antigens

2.1.2 B and T cell epitopes, haptens and adjuvants

2.1.3 Factors influencing immunogenicity

Unit – III

### **3.1 Antibodies**

3.1.1 Structure of antibody

- 3.1.2 Classes and functions of antibodies
- 3.1.3Monoclonal antibodies

Unit – IV

### 4.1 Working of Immune system

4.1.1 Structure and functions of major histocompatibility complexes

4.1.2 Exogenes and Endogenes pathways of antigen presentation and processing

4.1.3 Basic properties and functions of cytokines

Unit – V

### 5.1 Immune system in health and disease

5.1.1 Classification and brief description of various types of hyper sensitivities

5.1.2 Introduction to concepts of autoimmunity and immunodeficiency

### 5.2 Vaccines

- 5.2.1 General introduction to vaccines
- 5.2.2 Types of vaccines

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

### SEMESTER-VI (Model Question paper )

Paper Code : Zoo-601-A(El) Paper Title :Immunology

# Part - A

Answer <u>any five</u> questions out of eight in Part - A . Each question carries five marks  $5 \times 5 = 25$ 

- 1. 2. 3. 4. 5. 6.
- 7.

### <u>Part – B</u>

Answer <u>any five</u> questions out of eight in Part - B .Each question carries Ten marks.  $5 \times 10 = 50$ 

- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.

### ZOOLOGY PRACTICAL SYLLABUS

Period : 30 PAPER – VI Max.Marks:50 Credits :2 Paper Code : Zoo-601-A (El)P

Paper Title: Immunology

1. Demonstration of lymphoid organs (as per UGC guidelines)

2. Histological study of spleen, thymus and lymph nodes (through prepared slides)

3. Blood group determination

4. Demonstration of

a. ELISA

b. Immunoelectrophoresis

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

SEMESTER - VI Class: III B.Sc (B.Z.C)(CBCS) (Cluster Elective Paper: VIII-B-1)w.e.f 260 Hrs.(6hrs/week)Paper Code : ZOO-602B-1(Cl)Credits : 3ExternalTitle of the Paper: Principles of Aquaculture.If	2017 - 18 1 : 75 nternal:25
<ul> <li>UNIT -I</li> <li>1.1 Introduction / Basics of Aquaculture</li> <li>1.1.1 Definition, Significance and History of Aquaculture</li> <li>1.1.2 Present status of Aquaculture – Global and National scenario</li> <li>1.1.3 Major cultivable species for aquaculture: freshwater, brackish water and marine.</li> <li>1.1.4 Criteria for the selection of species for culture</li> </ul>	15hrs
<ul> <li>2.1 Types of Aquaculture</li> <li>2.1.1 Freshwater, Brackishwater and Marine</li> <li>2.1.2 Concept of Monoculture, Polyculture, Composite culture, Monosex culture and Integrated fish farming</li> <li>2.2Culture systems</li> <li>2.2.1 Ponds, Raceways, Cages, Pens, Rafts and water recirculating systems</li> <li>2.3Culture practices</li> <li>2.3.1Traditional, extensive, modified extensive, semi-intensive and intensive cultures of fish and shrimp.</li> </ul>	15hrs
<ul> <li>Unit – III</li> <li>3.1 Design and construction of aquafarms</li> <li>3.1.1Criteria for the selection of site for freshwater and brackish water pond farms</li> <li>3.1.2 Design and construction of fish and shrimp farms</li> <li>3.2 Seed resources</li> <li>3.2.1 Natural seed resources and Procurement of seed for stocking: Carp and shrimp</li> <li>3.3 Nutrition and feeds</li> <li>3.3.1 Nutritional requirements of a cultivable fish and shellfish</li> <li>3.3.2 Natural food and Artificial feeds and their importance in fish and shrimp culture</li> </ul>	15hrs
<ul> <li>Unit – IV</li> <li>4.1Management of carp culture ponds</li> <li>4.1.1 Culture of Indian major carps: Pre-stocking management – Dewatering, drying, ploughing/desilting; Predators, weeds and algal blooms and their control, Liming and fertilization; Stocking management – Stocking density and stocking; Post-stocking management – Feeding, water quality, growth and health care; and Harvesting ofponds</li> <li>4.2Culture of giant freshwater prawn, <i>Macrobrachiumrosenbergii</i></li> </ul>	10hrs
<ul> <li>Unit – V</li> <li>5.1 Types of cultures</li> <li>5.1.1Culture of shrimp (<i>Penaeus monodon</i> or <i>Litopenaeus vannamei</i>)</li> <li>5.1.2 Culture of pearl oysters</li> <li>5.1.3 Culture of seaweeds-species cultured, culture techniques, important by-products, pro</li> <li>5.1.4 Culture of ornamental fishes – Setting up and maintenance of aquarium; and breeding</li> </ul>	<b>10hrs</b> ospects ag.

### **REFERENCES BOOKS**

- 1. Bardach, JE et al. 1972. Aquaculture The farming and husbandry of freshwater and marine organisms, John Wiley & Sons, New York.
- 2. Bose AN et al.1991. Coastal aquaculture Engineering. Oxford & IBH Publ.Co.Pvt.Ltd.
- 3. Chakraborty C & Sadhu AK. 2000. *Biology Hatchery and Culture Technology of Tiger Prawn and Giant Freshwater Prawn*. Daya Publ. House.
- 4. FAO. 2007. Manual on Freshwater Prawn Farming.
- 5. Huet J. 1986. A text Book of Fish Culture. Fishing News Books Ltd.
- 6. ICAR. 2006. Hand Book of Fisheries and Aquaculture. ICAR.
- 7. Ivar LO. 2007. Aquaculture Engineering. Daya Publ. House.
- 8. Jhingran V.G. 2007. Fish and Fisheries of India. Hindustan Publ. Corporation, India.
- 9. Landau M. 1992. Introduction to Aquaculture. John Wiley & Sons.

### SEMESTER-VI Cluster Electives paper –VIII-B-1

Guide lines to

the paper setterTime :3 hrs Max.Marks:75

Principles of Aquaculture

Paper Title : Paper Code : Zoo-602B-1(El)

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 in Part-B. Each question carries 10 marks.

5 X 10 = 40M.

	PART	Unit – I	Unit – II	Unit – III	Unit – IV	Unit – V
5 Marks Questions	Α	2	2	2	1	1
10Marks Questions	В	2	2	2	1	1
Weightage		30	30	30	15	15

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

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

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

### SEMESTER-VI (Model Question paper ) Cluster Electives paper –VIII-B-1

Time : 3 hrs

Max.Marks:75

Paper Title : Principles of Aquaculture

Paper Code : Zoo-602B-1(El)

# <u>Part - A</u>

Answer <u>any five</u> questions out of eight in Part - A . Each question carries five marks.  $5 \times 5 = 25$ 

1. 2. 3. 4. 5. 6. 7. 8.

<u>Part – B</u>

Answer <u>any five</u> questions out of eight in Part - B .Each question carries Ten marks.  $5 \times 10 = 50$ 

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

### ZOOLOGY PRACTICAL - I

Credits:2

**PAPER – VIII** Periods

30

Max.Marks:50

Paper Title : Principles of Aquaculture

:

Code : ZOO-602B-1(El)P

### **Cultivable fishes**

- 1. Identification and study of important cultivable and edible fishes Any ten
- 2. Identification and study of important cultivable and edible crustaceans Any five
- 3. Identification and study of common aquarium fishes Any five
- 4. General description and recording biometric data of a given fish.

### Diseases

- 1. Identification and study of fish and shrimp diseases Using specimens / pictures
- 2. External examination of the diseased fish diagnostic features and procedure.
- 3. Autopsy of fish Examination of the internal organs.
- 4. Determination of dosages of chemicals and drugs for treating common diseases.

# **Pond Management**

- 1. Water Quality -Determination of temperature, pH, salinity in the pond water sample;
- 2. Soil analysis Determination of soil texture, pH, conductivity, available nitrogen, available phosphorus and organic carbon.
- 3. Identification and study of common zooplankton, aquatic insects and aquatic weeds Each 5

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

Practical - VIw.e.18Principles of AquacultureMax. Marks : 25Model Question Paper (External Paper Code : ZOO-601B (El)P	f. 2017 - ernal )
I. Cultivable fishes:	
1. Spotters: Identify , draw neat labeled diagram and comment on A,B,C & D	4X2=8M
<ul> <li><b>II.Diseases:</b></li> <li>2 Identification and study of fish and shrimp diseases - Using specimens / pictures A &amp;B</li> <li>3External examination of the diseased fish – diagnostic features and procedure.</li> </ul>	2X2=4M 3M
4. Determination of dosages of chemicals and drugs for treating common diseases.	1x3=3M
III.Pond Management:	
5. Identification and study of common zooplankton, aquatic insects and aquatic week	ls .2X2=4M

A & B 6. Salinity in the pond water sample. 3M A.G& S. G.S.Degree College of Arts &Science,Vuyyuru - 521165, Krishna Dt., A.P. (Autonomous)

Principles of AquacultureMax. Marks : 25 Model Question Paper (Internal) Paper Code : ZOO-601B (El)P

1. Attendance		5 M
2. Record		10M
3. Assignments		10M
	Total	25M

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

SEMESTER - VI(CBCS)w.e.f. - 2017 - 18Class: III B.Sc (B.Z.C)(Cluster Elective Paper: VIII-B-2)Paper Code : ZOO-603B-2(El) Credits : 3Internal:25

60 Hrs.(6hrs/week) External : 75

Title of the Paper: Aquaculture Management.

### Unit – I

### **1.1Breeding and Hatchery Management**

1.1.1 Bundh Breeding and Induced breeding of carp by Hypophysation; and use of synthetichormones.

1.1.2Types of fish hatcheries; Hatchery management of Indian major carps

1.1.3 Breeding and Hatchery management of Penaeus monodon/ Litopenaeus vannamei

1.1.4 Breeding and Hatchery management of giant freshwater prawn.

### Unit – II

2.1 Water quality Management

2.1.1Water quality and soil characteristics suitable for fish and shrimp culture

2.1.2 Identification of oxygen depletion problems and control mechanisms in culture ponds

2.1.3 Aeration: Principles of aeration and Emergency aeration

2.1.4 Liming materials, Organic manures and Inorganic fertilizers commonly used and their implications in fish Ponds.

### Unit – III

### 3.1 Feed Management

3.1.1Live Foods and their role in shrimp larval nutrition.

3.1.2 Supplementary feeds: Principal foods in artificial diets; Types of feeds; FeedadditivesandPreservatives; role of probiotics.

3.1.3 Feed formulation and manufacturing; Feed storage

3.1.4 Feeding strategies: Feeding devices, feeding schedules and ration size; Feedevaluation- feed conversion efficiencies and ratios

### Unit – IV

### 4.1 Disease Management

4.1.1 Principles of disease diagnosis and health management;

4.1.2 Prophylaxis, Hygiene and Therapy of fish diseases

4.1.3 Specific and non-specific defense systems in fish; Fish immunization and vaccination

4.1.4Etiology, Symptoms, prophylaxis and therapy of common fish diseases in fish ponds

4.1.5Etiology, Symptoms, prophylaxis and therapy of common shrimp diseases in shrimp ponds

### Unit – V

### **5.1 Economics and Marketing**

5.1.1 Principles of aquaculture economics – Capital costs, variable costs, cost-benefit analysis

5.1.2Fish marketing methods in India; Basic concepts in demand and price analysis

### **5.2 Fisheries Extension**

5.1.3 Fisheries Training and Education in India; Role of extension in communitydevelopment.

### **5.3 Fish Genetics**

5.1.4 Genetic improvement of fish stocks - Hybridization of fish.

5.1.5 Gynogenesis, Androgenesis, Polyploidy, Transgenic fish, Cryopreservation of gametes, Production of monosex and sterile fishes and their significance in aquaculture.

### 10hrs

10hrs

# 15hrs

# 15hrs

### 15hrs

### **REFERENCE BOOKS**

1. Boyd CE. 1979. Water Quality in Warm Water Fish Ponds. Auburn University

2. Boyd, CE. 1982. Water Quality Management for Pond Fish Culture. Elsevier Sci. Publ. Co.

3. Chakraborty C & Sadhu AK. 2000. *Biology Hatchery and Culture Technology of Tiger Prawn and GiantFreshwater Prawn*. Daya Publ. House

4. Conroy CA and Herman RL. 1968. Text book of Fish Diseases. TFH (Great Britain) Ltd, England.

5. Halver J & Hardy RW. 2002. Fish Nutrition. Academic Press.

6. Ian C. 1984. Marketing in Fisheries and Aquaculture. Fishing News Books.

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

### **SEMESTER-VI**

### **Cluster Electives paper –VIII-B-2**

# Guide lines to the paper setterTime :3 hrs

Max.Marks:75

### Paper Title

:Aquaculture Management Paper Code : Zoo-603B-2(El) Note :1. Answer <u>any five</u> questions out of eight in Part-A . Each question carries five marks.

5 X 5 = 25 M.

2. Answer <u>any five</u> questions in Part-B. Each question carries 10 marks.  $5 \times 10 = 50M$ .

	PART	Unit – I	Unit – II	Unit – III	Unit – IV	Unit – V
5 Marks Questions	Α	2	2	2	1	1
10 Marks Questions	В	2	2	2	1	1
Weightage		30	30	30	15	15

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

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

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

### (AUTONOMOUS)

### SEMESTER-VI (Model Question paper ) Cluster Electives paper –VIII-B-2

Time : 3 hrs

Max.Marks:75

**Paper Title :**Aquaculture Management.

Paper Code : Zoo-603B-2(El)

# <u>Part - A</u>

Answer <u>any five</u> questions out of eight in Part - A . Each question carries five marks.  $5 \times 5 = 25$ 

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# <u>Part – B</u>

Answer <u>any five</u> questions out of eight in Part - B .Each question carries Ten marks.  $5 \times 10 = 50$ 

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

### ZOOLOGY PRACTICAL - II

Credits: 2 PAPER – VIII-B Periods : 30 Max.Marks:50

**Paper Title :** 

Aquaculture Management

Code : ZOO-603B-2(El)P

### Nutrition

1. Identification and study of Live food organisms – Any five

2. Formulation and preparation of a balanced fish feed

3. Estimation of Proximate composition of aquaculture feeds – Proteins, carbohydrates, lipids, moisture, ash content.

4. Gut content analysis to study artificial and natural food intake.

### Post harvest Technology

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

analysis worksheet, plan form and corrective action procedures in processing of fish.

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

AquacultureManagementMax. Marks : 25 Model Question Paper (External )Paper Code : ZOO-601B-2 (El)P	
External ) Paper Code : ZOO-601B-2 (El)P	
T NT 4 141.	
I. NUTITION:	
1. Identification and study of Live food organisms -A&B. 2X2=4M	
2. Estimation of Proximate composition of aquaculture feeds $-A\&B$ . $2X2^{1/2}=5M$	
II. Post harvest Technology:	
3. Cured and fermented fish Products (Procedure) 5M	
4 Preparation of isinglass, collagen and chitosan from shrimp and crab shell 5M	
4. Treparation of isinglass ,conagen and entosan nom simmip and erab shen.	
5.1dentification of hazards & Comment on A & B $2x3=6M$	
Total 25M	

Practical - VI			w.e.f. 2017 - 18	
AquacultureMan	agement	Max. Marks : 25	Model Question Paper (	
Internal )	Paper Code : ZOO-601B	-2 (El)P		

1. Attendance	 5 M
2. Record	 10M
3. Assignments	 10M

Total -- 25M

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

### **<u>SEMESTER - VI</u>** (CBCS)

Class: III B.Sc (B.Z.C) (Cluster Elective Paper: VIII-B-3) w.e.f. - 2017 - 1860 Hrs Paper Code : ZOO-604B-3(El)

Credits : 3

Title of the Paper: **Postharvest Technology.** 

External : 75 Internal:25

### Unit – I

### 1.1 Handling and Principles of fish Preservation

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

1.1.2 Principles of preservation- cleaning, lowering of temperature, rising of temperature, downdation use of self use of fish preservatives, exposure to lowradiation of semme rays

denudation, use of salt, use of fish preservatives, exposure to lowradiation of gamma rays.

# Unit – II

### 2.1 Methods of fish Preservation

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

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

### Unit – III

### 3.1 Processing and preservation of fish and fish by-products

3.1.1Fish products – fish minced meat, fish meal, fish oil, fish liquid (ensilage), fish protein concentrate, fish chowder, fish cake, fish sauce, fish salads, fish powder, pet food from trash fish, fish manure.

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

### **3.2Seaweed Products**

3.2.1Preparation of agar, algin and carrageen. Use of seaweeds as food for humanconsumption, in diseasetreatment and preparation of therapeutic drugs.

### Unit - IV

### 4.1Sanitation and Quality control

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

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

### **4.2 Regulatory affairs in industries**

Unit – V

### 5.1 Quality Assurance, Management and Certification

5.1.1Seafood Quality Assurance and Systems: Good Manufacturing Practices (GMPs); Good Laboratory Practices (GLPs); Standard Operating Procedures (SOPs); Concept of Usered Applying and Critical Control Points (UACCP) in conford apfaty.

Hazard Analysis and Critical Control Points (HACCP) in seafood safety.

5.1.2 National and International standards – ISO 9000: 2000 Series of Quality Assurance System, Codex Alimentarius.

### **REFERENCE BOOKS**

- 1. Balachandran KK. 2001. Post-harvest Technology of Fish and Fish Products. Daya Publ.
- 2. Bond, et al. 1971. Fish Inspection and Quality Control. Fishing News Books, England

3 Clucas IJ. 1981. Fish Handling, Preservation and Processing in the Tropics. Parts I, II. FAO

4. Gopakumar K. (Ed.). 2002. Text Book of Fish Processing Technology. ICAR.

5. Govindan, TK. 1985. Fish Processing Technology, Oxford-IBH.

6. Hall GM. (Ed). 1992. Fish Processing Technology. Blackie.

7. Huss HH, Jakobsen M & Liston J. 1991. Quality Assurance in the Fish Industry. Elsevier.

### .G& S.G.S.DEGREE COLLEGE OF ARTS & SCIENCE, VUYYURU 521165, KRISHNA Dt., A.P. (AUTONOMOUS) SEMESTER-VI Cluster Electives paper –VIII-B-3

### Guide lines to the paper setterTime :3 hrs

Max.Marks:75

:Postharvest Technology.

Paper Title Paper Code : Zoo-604B-3(El)

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

5 X 5 = 25 M.

2. Answer **any five** questions in Part-B . Each question carries 10 marks.

5 X 10 = 50M.

	PAR T	Unit –I	Unit – II	UnitIII	Unit – IV	Unit – V
5 Marks Questions	Α	2	2	2	1	1
10 Marks Questions	В	2	2	2	1	1
Weightage		30	30	30	15	15

# **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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### SEMESTER-VI (Model Question paper ) Cluster Electives paper –VIII-B-3

Time : 3 hrs

Max.Marks:75

Paper Title : Postharvest Technology.

Paper Code :Zoo-604B-2 (El)

# <u>Part - A</u>

Answer <u>any five</u> questions out of eight in Part - A . Each question carries five marks.  $5 \times 5 = 25$ 

1. 2. 3. 4. 5. 6. 7. 8.

# Part – B

Answer <u>any five</u> questions out of eight in Part - B .Each question carries Ten marks.  $5 \times 10 = 50$ 

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

### **ZOOLOGY PRACTICAL – III**

Credits:2 PAPER - VIII-B Periods : 30 Max.Marks:50 Paper Title : Postharvest
Technology Code : ZOO -604B-3(El)P
Project Work

Visit to a fish breeding centre / fish farms and submit a project report or Visit to a feed manufacturing unit and submit a project report or Visit to a shrimp hatchery / shrimp farms and submit a project report or Visit to a shrimp processing unit and submit a project report