

B.Sc. Semester III

Course No. ZO-301 (Theory)

Time Duration: 3 Hrs

Maximum Marks: 100

Internal: 20

External: 80

UNIVERSITY Of JAMMU

Syllabi and Course of Study in Zoology

for the Examination to be held in the Years 2015, 2016 and 2017.

There shall be one written paper of 100 marks and one practical paper of 50 marks. Theory paper shall be of three hours duration and the practical paper shall be of four hours duration. 20% of the marks shall be reserved for internal assessment in theory paper and 50 % in the practical paper. Theory paper will be set for 80 marks and the practical paper for 25 marks. In case of the regular students internal assessment received from the college will be added to the marks obtained by them in the university examination and in case of private candidates marks obtained by them in the University examination shall be increased proportionately in accordance with the statues / regulation.

1.	Course /Paper Title	:	Chordate Life, Diversity and Functions
2.	Total Contact Hours	:	90 hrs.
3.	Maximum Marks	:	100
	i) External (Univ. Exam.)	:	80
	ii) Intemal Assessment	:	20
4.	Minimum Pass Marks	:	
	i) External	:	29
	ii) Internal	:	07
5.	Duration of Univ. Exam.	:	3 Hrs.

OBJECTIVES

The paper deals with chordate diversity and in each group from fishes to mammals, evolutionary terminals along specific lines of evolution, indicating organizational perfection along such specialized lines, can be recognized. Nevertheless, the converse, picture of emerging and continuing evolution can be appreciated in perfection to tetrapod through amphibia from fishes and birds and mammals from reptiles. The diversity of these large animals adds to the fascinations of the biosphere.

SYLLABUS

UNIT I

- 1.1 Chordates – Origin of chordates
- 1.2 General characters and classification of chordates upto class level.
- 1.3 Hemichordata
 - 1.3.1 Affinities and systematic position of *Balanoglossus*
- 1.4 Urochordata (type: *Herdmania*)
 - 1.4.1 Digestive system
 - 1.4.2 Circulatory system
 - 1.4.3 Reproductive system
 - 1.4.4 Affinities
- 1.5 Cephalochordata (type: *Amphioxus*)
 - 1.5.1 Digestive system
 - 1.5.2 Circulatory system
 - 1.5.3 Nervous system
 - 1.5.4 Affinities of *Amphioxus*

UNIT II Agnatha and Pisces

- 2.1 General characters and outline classification of Agnatha and Pisces upto order level.
- 2.2 Type: *Petromyzon*
 - 2.2.1 Digestive system and feeding
 - 2.2.2 Reproductive system
 - 2.2.3 Ammocoete larva
- 2.3 Type: *Scoliodon*
 - 2.3.1 Digestive system
 - 2.3.2 Respiratory system
 - 2.3.3 Urinogenital system
 - 2.3.4 Central nervous system

UNIT III Amphibians and Reptilia

- 3.1 General characters and classification of amphibians and reptiles upto order level
- 3.2 Amphibia (Type : Frog)
 - 3.2.1 Digestive system
 - 3.2.2 Respiratory system
 - 3.2.3 Circulatory system
 - 3.2.4 Urinogenital system
 - 3.2.5 Central nervous system
- 3.3 Reptile (Type : *Calotes*)
 - 3.3.1 Digestive system
 - 3.3.2 Respiratory system
 - 3.3.3 Circulatory system

- 3.3.4 Urinogenital system
- 3.3.5 Central nervous system

UNIT IV Aves and Mammalia

- 4.1 General characters and classification of Aves and Mammalia upto order level
- 4.2 Aves (Type : Pigeon)
 - 4.2.1 Digestive system
 - 4.2.2 Respiratory system
 - 4.2.3 Circulatory system
 - 4.2.4 Urinogenital system
 - 4.2.5 Central nervous system
- 4.3 Mammalia (Type: Rabbit)
 - 4.3.1 Digestive system
 - 4.3.2 Respiratory system
 - 4.3.3 Circulatory system
 - 4.3.4 Urinogenital system
 - 4.3.5 Central nervous system

UNIT V

- 5.1 Types of scales and fins in fishes
- 5.2 Migration in fishes
- 5.3 Parental care in fishes
- 5.4 Parental care in Amphibians
- 5.5 Migration in birds
- 5.6 Flight adaptation in birds
- 5.7 Skin, its derivatives and uses in mammals (Horns, digital tips and antlers)
- 5.8 Jaw suspension in vertebrates.

Note for the paper setters:

Section .A: 10 very short answer question are to be set. The maximum length of answer shall be 50 words. All tie questions are compulsory. Each question will carry 2 marks, total weightage being 20 marks

Section B: This section will comprise of ten long answer type questions, with two questions from each unit. Candidate will have to attempt 5 questions selecting one question from each Unit Each question will, carry 12 marks and the total weightage being 60 marks.

Books Recommended

1. Chordate Zoology- N. Arumugam, Vol. 2. Saras Publication
2. Text book of Zoology-Hymen series McGraw Hills
3. Chordate Zoology-E.L.Jordan & P.S. Verma. S. Chand Limited
4. Chordate zoology- P.S. Dhami & J.K. Dhami (1981) (R. Chand & Co.)
5. Principles of anatomy and physiology-G.J.Tortora & N.P. Anagnostakos (1984) (Harper & Row Publ., N.Y.).
6. Textbook of zoology, Vertebrates-A.J. Marshall (1995) (The McMillan Press Ltd., UK).
7. Chordate zoology- E.L. Jordan & P.S. Verma (1998) (S. Chand & Co.)

8. Modern textbook of Zoology (Vertebrates) -R.L.Kotpal (2000). (Rastogi Publ., Meerut).
9. Functional Anatomy of the Vertebrates: An Evolutionary Perspective- Liem, Karel F., William E. Bemis, Warren F. Walker, Lance Grande (2001). Brooks Cole.
10. Advanced Chordate Zoology-Gurdarshan Singh & H. Bhaskar (2002). Campus Books.

B.Sc. Semester III

Course No. ZOI-301 (Practical)

Maximum Marks: 25

Syllabi and Course of Study in Zoology for the Examination to be held in the Years 2015, 2016 and 2017

1. Study of external features of the following types:

Amphioxus:	With special reference to oral hood, Velum, branchial wall, section through various regions.
Herdmania:	with special reference to test, test spicules, branchial basket, neural gland.
Balanoglossus:	With particular stress on anterior region through sagittal sections.
Cyclostoma:	<i>Petromyzon, Myxine</i>
Elasmobranchi:	<i>Scoliodon</i>
Teleostomi:	<i>Cyprinus carpio</i>
Amphibia:	Frog, Salamander
Reptiles:	<i>Uromastix</i> , turtle
Birds:	Columba, Fowl
Mammals:	Rabbit, Squirrel

2. Distinguishing characters and classifications of protochordate through chordate (upto orders only) exemplified through following animal types:

- 2.1 *Pyrosoma, Botryllus, Salpa, Ammocoetus* larva
- 2.2 *Zygaena, Stegostoma, Dasyatis, Heptanchus, Charchardon, Pristis, Tarpedo, Rhinobatis, Chimera*
- 2.3 *Protopterus, Acipenser, Lepidosteus, Amia*
- 2.4 *Salmo, Barbus, Cyprinus, Schzothorax, Clarias, Heteropneustes, Glyptothorax, Botia, Nemachueilus, Ophiocephalus, Exocoetus, Pleuronectus, Anguilla, Gambusia*
Anabas, Pterois, Echineis
- 2.5 *Ichthyophis, Oerotyphlus, Ambryostoma, Axolotl larva, Amphiuma, Salamander Siren, Pipa, Hyla, Bufo, Racophorus*
- 2.6 *Chelona, Trionyx, Kachuga, Testudo, Sphenondon, Hemidactylus, Chameleon, Draco, Heloderma, Calotes, Phynosome, Ophisaurus, Typhlops, Python, Bungarus, Naja, Viper, Hydrophis, Crotalus, Zamenis, Crocodilus, Gavialis*

- 2.7 *Archaeopteryx, Penguin, Struthio, Apteryx, Milvus, Eudynamys, Psittacula, Buba, Coracias, Dinopium, Passer, Carvus, Ardaa, Anas, Pavo, Cotumix, Pheasants*
- 2.8 *Echidna, Didelphis, Macrophus, Talpa, Echinorex, Pteropus, Desmodus, Lampur, Tersius, Armadiles, Manis, Rabbit, Rattus rattus, Funadamulus hystrix, Whale, Dolphin, Hyaena, Panthera, Civet, Cat, Canis, Vulpes, Herpestes, Phoca, Otario, Elephus, Halicore, Mantiees, Equas, Rhinoceros, Sus, Hippopotamus, Dicotyles, Cow, Buffalo, Sheep, Goat*
3. Dissect the fish to study the following systems:
- 3.1 Digestive system
 - 3.2 Nervous System
 - 3.3. Taking out Pituitary and Weberian ossicles
- 4 Study of the following skeleton:
- 4.1 Skull of frog and Varanus
 - 4.2 Axial and Appendicular skeleton of Frog and Varanus

B.Sc. Semester IV

Course No. ZO-401 (Theory)

Time Duration: 3 Hrs

Maximum Marks: 100

Internal: 20

External: 80

UNIVERSITY Of JAMMU

Syllabi and Course of Study in Zoology

for the Examination to be held in the Years 2016, 2017 and 2018.

There shall be one written paper of 100 marks and one practical paper of 50 marks. Theory paper shall be of three hours duration and the practical paper shall be of four hours duration. 20% of the marks shall be reserved for internal assessment in theory paper and 50 % in the practical paper. Theory paper will be set for 80 marks and the practical paper for 25 marks. In case of the regular students internal assessment received from the college will be added to the marks obtained by them in the university examination and in case of private candidates marks obtained by them in the University examination shall be increased proportionately in accordance with the statues / regulation.

1.	Course /Paper Title	:	Comparative Physiology of animals
2.	Total Contact Hours	:	90 hrs.
3.	Maximum Marks	:	100
	i) External (Univ. Exam.)	:	80
	ii) Intemal Assessment	:	20
4.	Minimum Pass Marks		
	i) External.	:	29
	ii) Internal	:	07
5.	Duration of Univ. Exam.	:	3 Hrs.

OBJECTIVES

It deals broadly with animal functions, embryology and environmental biology. The student is introduced to some important functional aspects of endocrinology and reproductive biology. Some topics on the developmental biology have also been included in the course to acquaint the students with different patterns of development in animals. This paper also introduces a student to the emerging and all important concepts of environmental biology so that he/she develops not only environmental awareness and understands hazards of depleting environment but also carry this message for the society in general. Fir this reason the student is exposed to a syllabus which aims at projecting the ecosystem

concept magnifying the wholesomeness, its homeostasis and delicate balance that exists therein. Besides, the study deals with human interferences resulting in expression of environmental pollution.

SYLLABUS

UNIT I

1.1 Nutrition, feeding and digestion

- 1.1.1 Types of nutrition and Feeding mechanisms (Microphagy ; macrophagy, Filter feeding)
- 1.1.2 Digestion – extracellular and intercellular types.
- 1.1.3 Enzymatic digestion
- 1.1.4 Hormonal control of digestion
- 1.1.5 Symbiotic digestion.

1.2 Respiration

- 1.2.1 Types of respiration ; Cutaneous respiration; branchial respiration; pulmonary and tracheal respiration
- 1.2.2 Respiratory pigments and their role
- 1.2.3 Mechanism of gas exchange and its transport in mammals
- 1.2.4 Regulation of respiration in mammals

UNIT II

2.1 Circulation

- 2.1.1 Closed and open circulatory systems
- 2.1.2 Types of heart and Patterns of blood flow: Chambered type, tubular type, pulsatile vessels, ampullary type.
- 2.1.3 Pace maker, myogenic and neurogenic type of heart
- 2.1.4 Thermoregulation

2.2 Excretion

- 2.2.1 Excretory organs and nitrogenous wastes
- 2.2.2 Ammonotelism, Ureotelism and Uricotelism

2.3 Osmoregulation

- 2.3.1 Osmoregulation in fresh water, marine, estuarine and terrestrial environment

UNIT III Endocrinology of Reproduction

- 3.1 General organization of pituitary gland in mammals
- 3.2 Hypothalamo-hypophyseal axis
- 3.3 Pituitary hormones
- 3.4 Pituitary-gonadial axis
- 3.5 Gonadial hormones and their functions
- 3.6 Menstruation in primates
- 3.7 Oestrous cycle in primates

UNIT IV Developmental Biology

- 4.1 Gametogenesis (Spermatogenesis and Oogenesis), Types of eggs.
- 4.2 Fertilization: Egg sperm interaction, Acrosome reaction activation and polarity of egg Cleavage: Types and patterns; Elementary concepts of inner cell mass and stem cells
- 4.3 Process of Blastulation and fate-map construction in frog
- 4.4 Gastrulation in Frog upto the formation of three germinal layers
- 4.5 Development of Amphioxus upto formation of coelom
- 4.6 Extra embryonic membrane of chick
- 4.7 Placentation in mammals
- 4.8 Retrogressive metamorphosis in Ascidians (*Herdmania*)

UNIT V Ecology: Ecosystem concept and energetic

- 5.1 Ecology – its definition and relation to humanity
- 5.2 Ecological niche, habitat, biosphere, biome, ecotone
- 5.3 Ecosystem concepts and Homeostasis
 - 5.3.1 Energy flow in ecosystem
- 5.4 Primary productivity
- 5.5 Food chains: grazing food chains and detritus food chains
- 5.6 Food webs
- 5.7 Trophic structure and ecological pyramids such as pyramids in number, biomass and energy.
- 5.8 Analysis and evaluation of an ecosystem**
 - 5.8.1 Abiotic and biotic factors
 - 5.8.2 Population and community structure
 - 5.8.3 Ecological succession
- 5.9 Human activity and natural resources**
 - 5.9.1 Deleterious influence on wildlife resources and its conservation
 - 5.9.2 Endangered Species (Overview)
 - 5.9.3 Pollution:
 - 5.9.3.1 Air pollution
 - 5.9.3.2 Water pollution
 - 5.9.3.3 Noise pollution
 - 5.9.4 Conservation of natural resources (Overview)

Note for the paper setters:

Section .A: 10 very short answer question are to be set. The maximum length of answer shall be 50 words. All tie questions are compulsory. Each question will carry 2 marks, total weightage being 20 marks

Section B: This section will comprise of ten long answer type questions, with two questions from each unit. Candidate will have to attempt 5 questions selecting one question from each Unit Each question will, carry 12 marks and the total weightage being 60 marks.

Books recommended:

1. Text book of zoology – Parker and Haswell Vol. II
2. Chordate Zoology and Elements of Animal Physiology –E.L. Jordon and Verma, P.S.
3. Zoology and Chordates by H.C. Nigam, Vishal Publications, Jalandhar
4. Comparative Anatomy- M.D.L. Srivastava
5. Comparative Anatomy – Kingley
6. Life of Mammals – J.Z. Young
7. Fundamentals of Ecology – Odum
8. Ecology by Kermondy
9. Field Biology – Bente and Wegner
10. Wildlife of India – Sahasia
11. Animals and Environment – Vernberg
12. Wildlife Ecology –Aeron
13. Wildlife Management – Dasmann
14. Manual of Zoology Vol II Chordata – Ayyar, E.K., T.N. Anorthakrishnan
15. Chordate structure and function – Waterman, A.N. and Others
16. General and Comparative Physiology – W.S. Hoar
17. Principles of Animal Physiology – Wood, D.W.
18. Animal physiology –Eckert
19. An Introduction to Embryology –Balinsky
20. Biology of Developing System – Grant
21. Developmental Biology – Gilbert.

B.Sc. Semester IV

Course No. ZO-401 (Practical)

Maximum Marks: 25

Syllabi and Course of Study in Zoology for the Examination to be held in the Years 2016, 2017 and 2018

This paper deals with practical pertaining to animal diversity (Chordate); Comparative anatomy (Protochordates through chordate)

1. Preparation of permanent mounts of the following:
 - 1.1 Velum, Oral hood and Pharyngeal of Amphioxus
 - 1.2 Ampullae of Lorenzini, Placoid scale, Ctenoid scale of fish, stripped muscles of frog from pectoral girdle or thigh
2. Study of following skeleton:
 - 2.1 Skull of Fowl and Rabbit
 - 2.2 Axial and Appendicular skeleton of fowl and rabbit
3. Study of types of eggs (Frog, Reptiles and Birds)
4. Study of chick embryology through stained mounts (18 Hrs.; 24 Hrs.; 36 Hrs.; 48 Hrs.; 72 Hrs.)
5. Simple lab. Tests for detection of protein carbohydrate, fats
6. Action of Enzymes (Amylase and Pepsin)
7. Blood smear, Leishman's stain, prepared slides for making different leucocyte count through Arneith's count methods
8. Study of histology of different endocrine glands from prepared slides (pituitary and Gonads)
9. Demonstration of different types of Placenta in mammals through models or preserved specimens.
10. Study of types of feet and claws, feathers and beaks in birds.
11. Viva-voce.

B.Sc. Semester V

Course No. ZO-501 (Theory)

Time Duration: 3 Hrs

Maximum Marks: 100

Internal: 20

External: 80

UNIVERSITY Of JAMMU

Syllabi and Course of Study in Zoology

for the Examination to be held in the Years 2016, 2017 and 2018.

There shall be one written paper of 100 marks and one practical paper of 50 marks. Theory paper shall be of three hours duration and the practical paper shall be of four hours duration. 20% Of the marks shall be reserved for internal assessment in each theory paper and 50 % in the practical paper. Theory paper will be set for 80 marks and the practical paper for 25 marks. In case of the regular students internal assessment received from the college will be added to the marks obtained by them in the university examination and in case of private candidates marks obtained by them in the University examination shall be increased proportionately in accordance with the statues / regulation.

1. Course / PaperTitle	:	PARASITOLOGY
2. Total Contact Hours	:	90 hrs.
3. Maximum Marks	:	100
i) External (Univ. Exam.)	:	80
ii) Internal Assessment	:	20
4. Maximum Pass Marks		
i) External	:	29
ii) Internal	:	07
5. Duration of Univ. Exam.	:	3 Hours

OBJECTIVES

The Course is designed to introduce the student to the fundamental of parasitology so that the knowledge thus gained could be useful to them in the later walk of life as extension specialists or as scientific investigations. The course entails a broad view of morphology biology and bionomics of the parasites specific to man.

SYLLABUS

UNIT I

- 1.1 Scope and definition of parasitology.
- 1.2 Symbiotic relationship and its types
- 1.3 Concept of susceptibility.
- 1.4 Concept of Immunity.
- 1.5 Vector and host types and interdependence.
- 1.6 Types of parasitic relationships in animal kingdom.
- 1.7 Parasitic adaptation

UNIT II

- 2.1 Structure of virus with special reference to bacteriophage.
- 2.2 Classification of viruses.
- 2.3 Study of following diseases caused by viruses in man, their symptoms, mode of transmission and preventive measures.
 - 2.3.1 AIDS
 - 2.3.2 RABIES
 - 2.3.3 MEASLES
- 2.4 Structure of Bacteria
- 2.5 Study of following bacterial diseases of man, their symptoms, mode of transmission and preventive measures.
 - 2.5.1 Tuberculosis
 - 2.5.2 Typhoid
 - 2.5.3 Cholera

UNIT III

Habit, Habitat, general morphology, specific adaptability, mode of transmission, life cycle, pathogenesis and prophylaxis of the following protozoan parasites of man

- 3.1.1 *Giardia*
- 3.1.2 *Trypanosoma*
- 3.1.3 *Entamoeba*
- 3.1.4 *Plasmodium*
- 3.1.5 *Leishmania*
- 3.1.6 *Balantidium coli*

UNIT IV

- 4.1 Habit, habitat, general morphology, specific adaptability mode of transmission, life cycle, pathogenesis and prophyxis of the following parasites of the man.
- 4.1.1 *Schistosoma*
 - 4.1.2 *Fasciolopsis buski*
 - 4.1.3 *Diphyllobothrium*
 - 4.1.4 *Echinococcus*
 - 4.1.5 *Wuchereria*
 - 4.1.6 *Ancylostoma*
 - 4.1.7 Acanthocephala : General organization and economic Importance

UNIT V

- 5.1 Gastro – intestinal tract as habitat of protozoan and helminth parasites of man
- 5.2 Blood and lymph as habitat of nematode parasites of man.
- 5.3 Reticulo-endothelial system as habitat of protozoan parasite of man
- 5.4 Host – parasite specificity

NOTE FOR PAPER SETTING

Section .A: 10 very short answer question are to be set. The maximum length of answer shall be 50 words. All tie questions are compulsory. Each question will carry 2 marks, total weightage being 20 marks

Section B: This section will comprise of ten long answer type questions, with two questions from each unit. Candidate will have to attempt 5 questions selecting one question from each Unit Each question will, carry 12 marks and the total weightage being 60 marks.

Books Recommended

1. Cemeron, D. Parasites and Parasitism
2. Kudo,P.R. Protozoology
3. Greal, K.G Protozoology, Springer- Variog, Budlin
4. Baker Parasitic Protozoa – Hutchinson Lib. Series
5. Hyman, H. The Invertebrate Protozoa Through Ctenophora
6. Gynab .L.H. (1951) the Invertebrates Planthyeminthes, Vol.III
7. Ben Daves (1968) The trematoda, Cambridge Univ. Press
8. Thomas Chang (1964) The Biology Of animal Parasites Toppan Co Ltd. Tokyo , Japan

SEMESTER-V
Laboratory Course No. ZO-501 (PRACTICAL)

Marks: 25

**SYLLABI AND COURSES OF STUDY IN ZOOLOGY
FOR THE EXAMINATION TO BE
HELD IN THE YEARS 2016, 2017 AND 2018.**

1. Study of Sea – anemone and Hermit crab as an example of commensalism.
2. Prepare a permanent mount of *Trichonympha* from the gut of termites as an example of mutualism.
3. Preparation of stained slides and identification of bacteria from the curd culture.
4. Study of the following protozoan parasites through prepared slides
 - 1) *Leishmania* 2) *Trypanosoma*
 - 3) *Entamoeba* 4) *Plasmodium*
 - 5) *Balantidium*
5. Morphometry and identification of locally available carps and cat fishes.
6. Preparation of permanent mount and identification of metazoan parasites of fish.
7. Study of parasites (bed bug and lice) in relation to their adaptations.
8. Study of ticks and mites from prepared slides
9. A visit to sericulture farm.
10. A visit to fish farm/aquarium
11. A visit to University Zoological Park
12. Viva-voce.

B.Sc. Semester VI

Course No. ZO-601 (Theory)

Time Duration: 3 Hrs

Maximum Marks: 100

Internal: 20

External: 80

UNIVERSITY OF JAMMU

Syllabi and Course of Study in Zoology

for the Examination to be held in the Years 2017, 2018 and 2019.

There shall be one written paper of 100 marks and one practical paper of 50 marks. Theory paper shall be of three hours duration and the practical paper shall be of four hours duration. 20% Of the marks shall be reserved for internal assessment in each theory paper and 50 % in the practical paper. Theory paper will be set for 80 marks and the practical paper for 25 marks. In case of the regular students internal assessment received from the college will be added to the marks obtained by them in the university examination and in case of private candidates marks obtained by them in the University examination shall be increased proportionately in accordance with the statues / regulation.

1. Course / PaperTitle	:	ECONOMIC ZOOLOGY
2. Total Contact Hours	:	90 hrs.
3. Maximum Marks	:	100
iii) External (Univ. Exam.)	:	80
iv) Internal Assessment	:	20
4. Maximum Pass Marks		
iii) External	:	29
iv) Internal	:	07
5. Duration of Univ. Exam.	:	3 Hours

Objective

The course deals broadly with Economics zoology besides providing an insight into the relative usefulness of animals as human food. The course introduces the students to some important economic aspects of Zoology, a line which they may ultimately choose to develop for their self –employment (whole time or part time).

SYLLABUS

UNIT I:- AQUACULTURE

- 1.1 Definition and scope of Aquaculture
- 1.2 Monoculture
 - 1.2.1 Prawn culture

- 1.2.2 Pearl culture
- 1.2.3 Carp culture
- 1.2.4 Trout culture
- 1.3 Polyculture (Composite fish culture)
- 1.4 Induced Breeding in fishes
- 1.5 Economic importance of fishes

UNIT II: APICULTURE SERICULTURE AND LAC CULTURE

2.1 Apiculture :

- 2.1.1 General morphology of honey bees, laying special stress on mouth parts and appendages of workers
- 2.1.2 Life cycle of Honey –bee
- 2.1.3 Uses of honey & Bee – Wax; composition of honey
- 2.1.4 Methods use in Apiculture
- 2.1.5 Predators and Parasites of honey bee
- 2.1.6 Bee Venom as medicine

2.2 Sericulture

- 2.2.1 Life Cycle of silk worm
- 2.2.2 Silk producing insects in India and kinds of silk fibers produced
- 2.2.3 Economic Importance of Silk worm
- 2.2.4 Mulberry cultivation for sericulture
- 2.2.5 Principles of silk worm rearing
- 2.2.6 Pebrine Disease, Its Genesis Pathogenesis And Prophylaxis

2.3 Lac Culture

- 2.3.1 Life Cycle of Lac Insect
- 2.3.2 Lac Cultivation, Formation, its processing and Uses

UNIT III Poultry and cattle farming

3.1 Poultry farming

- 3.1.1 Breeds of Poultry birds and their characteristics; Rhode island red ; white- Leghorn; Black Minorca; Aseel , Chittagong
- 3.1.2 Poultry breeding and rearing
- 3.1.3 Poultry diseases: causes, symptoms, mode of transmission and prophylaxis of the following poultry diseases, Ranikhet, Coccidiosis and Avian tuberculosis.

3.2 Cattle Farming

- 3.2.1 Breeds of dairy cattle and their characteristics Red Sindhi, Sahiwal, Red Dane, Holstein–Friesian, Jersey
- 3.2.2 Cattle diseases: Mastitis, Anthrax, Foot and Mouth diseases
- 3.2.3 Integrated animal farming

UNIT –IV : Animal Pests

- 4.1 Nematode parasite of potato, tomato and wheat.
- 4.2 Insect Pests:
 - 4.2.1 Insect pests of stored food : diagnostic features, extent of damage and control measures.
 - 4.2.1.1 *Sitophilous oryze* (Rice – Weevil)
 - 4.2.1.2 *Tribolium castenum* (red – flour beetle)
 - 4.2.1.3 *Rhizopertha dominica*
- 4.3 Insect Pests of standing crops
 - 4.3.1 *Leptocorsia vericornis* (Rice- Gundhi Bug)
 - 4.3.2 *Pectinophora gossypiella* (Pink- boll worm of Cotton)
 - 4.3.3 *Diacrisia obliqa* (Bihar – hairy Caterpillar)
- 4.4 Insects as vectors of human diseases
- 4.5 Ticks and mites: their harms, role and control
- 4.6 Snakes
 - 4.6.1 Poisonous snakes and venom
 - 4.6.2 Role of snakes in rodent pest control
- 4.7 Birds :
 - 4.7.1 Birds as pest
 - 4.7.2 Role of birds in pest control

UNIT V : BIOTECHNOLOGY

- 5.1 General concepts of Biotechnology
- 5.2 Biotechnology in live stock:
 - 5.2.1 in-vitro fertilization
 - 5.2.2 Artificial insemination
 - 5.2.3 Surrogate mothers : embryo transfer technology
 - 5.2.4 Cloning (basic concept)
- 5.3 Applications of Biotechnology
 - 5.3.1 Biogas
 - 5.3.2 Biofertilizers
 - 5.3.3 Bioinsecticides
 - 5.3.4. Antibiotics

NOTE FOR PAPER SETTING

Section .A: 10 very short answer question are to be set. The maximum length of answer shall be 50 words. All tie questions are compulsory. Each question will carry 2 marks, total weightage being 20 marks

Section B: This section will comprise of ten long answer type questions, with two questions from each unit. Candidate will have to attempt 5 questions selecting one question from each Unit Each question will, carry 12 marks and the total weightage being 60 marks.

Books Recommended

1. Ullal S.R. and Narsimabanna
2. Technology of fishes , Acad. Press London
3. Singh V P and Ramachandran , V (1985), Fresh Water fish culture ICAR New Delhi
4. Stickney , R R (1979) Principle of warm water aquaculture , John Willey & Sons New Delhi
5. Jhingran, VP (1982) Fish and Fisheries of India Hindustan Pub. Corp. (India) New Delhi
6. Kurian C V and Sebastian V C , Prawns and prawn Fisheries of India Hindustan Publ Corp (India) New Delhi
7. Prave P Faust I sitting W & Sukatsch , D A (1987) fundamental Of Biotechnology VCH Pub Germany
8. Higgim , I J best DJ and Jones J (1985), Biotechnology Principle and Application Blackwell Scientific Publ. Oxford
9. Banerjee, G C (1982), Poultry , Oxford and IBM Publ
10. Naik K K Anathakrishnan , T N and David B V, Poultry , Oxford and IBM Publ.
11. Matcalf C.L. and Flint, W.P. Useful and destructive insects. Tata McGraw hill Publ. New Delhi
12. Roberts. S.O. Veterinary Obaterrics and genital diseases
13. Shukla and Upadhya Economic Zoology
14. Kovaleve ,P.A. Silkworm breeding stocks Central Silk Broad, Marine , Drive Bombay
- 15 Roger , A Morse, The ABC and XYZ of Bee Culture A.I. Root & Co Medina , Ohia

B.SC. SEMESTER-VI
Laboratory Course No. ZO-601 (PRACTICAL)

Marks: 25

SYLLABI AND COURSES OF STUDY IN ZOOLOGY
FOR THE EXAMINATION TO BE
HELD IN THE YEARS 2017, 2018 AND 2019.

1. Morphology of Head, Wings, Legs, Thorax and Abdomen of Honey bee
2. Preparation of permanent / temporary mount of mouth parts, sting apparatus and hind legs of Honey bee
3. Study of life history of Honey bee
4. Study of life history of *Bombyx mori*.
5. Study of type of silk fibers from prepared slides
6. Candling of egg of fowl for differentiation of the fertilized eggs from the unfertilized eggs
7. Study of the following insect pest
 - i) Rice-weevil
 - ii) Red flour beetle
 - iii) Lesser Grain borer
 - iv) Rice-Gundi bug
 - v) Pink ball worm of cotton
 - vi) Bihar hairy caterpillar
8. Collection and preservation of insects and preparation of insectarium.
9. Identification and culture of fish food organism (protozoa and rotifers)
10. A visit of apiculture farm.
11. A visit to poultry farm.
12. A visit to dairy farm
13. Study of common poisonous snakes from specimens
14. Aquaculture: identification of cultivable
 - i. Prawn, crab, lobster,
 - ii. Clams, mussel and oyster
 - iii. Cold Water Fishes
 - iv. Ornamental and exotic fishes
15. Study of predatory insects (praying mantis and dragon fly) in relation to their adaptations.
16. Viva-voce.