

## B.Sc. Part III Examination, 2015

### ZOOLOGY

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Theory		Marks (Min.Pass Marks;54)
Paper I	: Animal Physiology and Biochemistry	50
Paper II	: Behaviour and Ecology	50
Paper III	: Applied Zoology	50
Practicals	:	75 (Min.Pass Marks;27)
Duration of each theory paper		3 hours
Duration of practical examination		5 hours

*Note:* Each theory paper is divided in three parts i.e. Section-A, Section –B and Section –C.

Section-A: Will consist of 10 compulsory questions. There will be two questions from each unit and answer of each question shall be limited up to 30 words. Each question will carry of 1 mark.

Section –B: Will consist of 10 questions. Each unit will be having two questions; students will answer one question from each Unit. Answer of each question shall be limited up to 250 words. Each question carries 3.5 Marks.

Section-C: will consist of total 05 questions. Students will answer any 03 questions and answer of each question shall be limited up to 500 words. Each question carries 7.5 Marks.

#### PAPER I

#### **Animal Physiology and Biochemistry**

Unit 1 : Digestion; digestive enzymes, process of digestion, digestion of protein, carbohydrate and lipid

Blood : Composition and functions, Blood groups, Rh factor and their significance, blood clotting mechanism, blood pressure and cardiac cycle, respiratory pigments, cardiac muscle activity.

- Unit 2 : Muscle : Structure of various types of muscles and mechanism of muscle contraction  
 Excretion : Structure of kidney, types of nephron, mechanism of urine formation and its elimination and arginine, ornithin cycle.
- Unit 3 : Respiration : Structure of lung, mechanism of respiration, respiratory pigment, exchange and transport of oxygen and carbon dioxide.  
 Nervous System : Structure of neuron and its classification, Nerve impulse, impulse conduction and reflex action.
- Unit 4 : Endocrine glands : Structure and functions of various endocrine glands, diseases caused by hormonal deficiency ; Mechanism of hormone action.
- Unit 5 : Structure of Protein and Carbohydrates; oxidation of glucose through glycolysis, Krebs cycle and oxidative phosphorylation, deamination, transamination and decarboxylation.

## PAPER II

### **Ecology and Behaviour**

- Unit 1 : Introduction of ecology, definition, history, sub division and scope of ecology. Environmental factors; physical factors- soil, water, air and temperature. Biotic factors- interspecific and intraspecific relations, neutralism, mutualism, commensalism, antibiosis, parasitism, predation, competition. Concept of limiting factors, Liebig's law of minimum, Shelfords law of tolerance, combined concept of limiting factors.
- Unit 2 : Population and community ecology, measurement of population density. Factors affecting population growth, growth factors, dispersal, characteristic of community, concept of ecosystem and niches.  
 Food chain, food web, Ecological pyramid. Energy flow in an ecosystem, biogeochemical cycles of CO<sub>2</sub>, N<sub>2</sub>, O<sub>2</sub>, S and P. Prospects and strategies of sustainable development.
- Unit 3 : Brief introduction to the major ecosystem of the world and ecological succession, conservation of natural resources; Ecology in relation to Thar desert.  
 Brief account of environmental pollution, global warming and its impact upon Human race.

Unit 4 : General survey of various types of animal behaviour; Methods of studying animal behaviour, Role of hormones and pheromones in behaviour, Biological rhythms.

Unit 5 : Learning and Memory – Conditioning, Habituation, Insight learning, Association learning, Reasoning and Communication; Wildlife of Rajasthan and its conservation.

PAPER III  
**Applied Zoology**

Unit 1 : Poultry keeping – Types of poultry breeds, poultry housing, farm and farm management, system of poultry farming; Grading, handling and marketing of eggs. Poultry diseases and Vermiculture; Methodology and products.

Unit 2 : Sericulture : Different kinds of silk producing insects in India and its potentialities. Host plants of silk insects. Grainage, rearing and life cycle. Breeding and various diseases of silkworm. Reeling and fibre technology. Economics of sericulture.

Unit 3 : Apiculture : Different kinds of honey bees found in India and, their identification. Identification of Queen, worker and drone. Importance of keeping bees in artificial hives and different kinds of hives. Care and management of bee colonies. Bee enemies and their control. Extraction and processing of honey from the comb. Utility and economics of production of honey. Honey bees and pollination strategy in agricultural crops.

Unit 4 : Pest Management : Insect pests of important crops (cotton, Rice, sugar cane & pulses), insect pest of veterinary and medical importance, pest outbreaks and assessment of losses caused by the insect pests on crops; population dynamics of insect pests; Principles of Biological, mechanical and cultural methods of pest control. Integrated Pest Management (IPM). Principles of pest control by pesticides.

Important vertebrate pests; birds and mammals with special reference to rodents and their management.

Unit 5 : General principles of aquaculture; transportation of fish seed and brooders. Induced Breeding, Composite fish culture, Lay out of fish farm and its management, By-products of fishing industry; Prawn culture; Management of water bodies for aquaculture.

## Practicals

1. Haemoglobin estimation of mammalian blood
2. Preparation of heamin crystals
3. Osmotic effect of R.B.C.
4. Preparation of mammalian blood film and identification of different types of blood cells
5. Determination of blood groups and Rh-factor
6. To determine the rate of oxygen consumption of rat
7. Analysis of urine for sugar, protein and pH
8. Estimation of E.S.R.
9. Demonstration of amylase activity
10. Estimation of packed cell volume [PCV]
11. Demonstration of working of pH meter
12. Demonstration of working of colorimeter
13. Measurement of blood pressure
14. Study of different spraying and dusting equipment
15. Use of pesticides and precautionary measures
16. Measurement of temperature and relative humidity
17. Estimation of soil moisture
18. Estimation of water holding capacity of different soils
19. Ecosystem study : Aquarium
20. Pond water study to identify zoo-planktons and their permanent preparations
21. Permanent preparation of any two stored grain pests. Two parasitic insects and termites
22. Honey bee : Permanent preparation of pollen basket and mouth parts
23. Permanent preparation of mouth parts of butterfly, moth, mosquito and cockroach
24. Project report based upon study of local fauna
25. Dissection of nervous system of grasshopper/locust and cockroach

## Distribution of Marks

Maximum Marks : 75  
Minimum Pass Marks : 27

	<u>Regular</u>	<u>Ex.</u>
Physiology Experiment	12	15
Ecology Experiment	12	15

Spots (six)	12	18
Dissection	07	10
Project report on local fauna	07	--
Permanent preparation	05	07
Viva-voce	10	10
Record	10	--
	Total 75	75

List of Recommended Books:

1. Srivastava, H.S. : Elements of Biochemistry, Rastogi Publications, Meerut
2. Goel, K.A. and Shastry, K.B. : Animal Physiology, Rastogi Publication, Meerut
3. Dalela, R.C. : Animal Physiology, S. Chand & Co. Ltd., New Delhi
4. Agarwal, R.A., Srivastava, Anil Kumar and Kaushal Kumar : Animal Physiology and Biochemistry, S. Chand & Co. Ltd., New Delhi
5. Kulshrestha, V.V. : Experimental Physiology, Vikas Publishing House, New Delhi
6. Samasiviah, I. et.al. : Text Book of Animal Physiology and Ecology, S. Chand & Co. Ltd., New Delhi
7. Verma, P.S., Tyagi, B.S. and Agarwal, V.K. : Animal Physiology, S. Chand & Co. Ltd., New Delhi
8. Hoar, S. : General and Comparative Physiology, Prentice Hall of India Pvt. Ltd.
9. Wood, D.W. : Principles of Animal Physiology
10. Prosser, C.B. : Comparative Animal Physiology, Satish Book Enterprise
11. Eckert, Animal Physiology. (W.H. Freeman)
12. Parihar, R.P. : Fish Biology and Indian Fisheries, Central Publication House, Allahabad
13. Kovaleve, P.A., Silkworm Breeding Stocks, Central Silk Board, Marine Drive, Mumbai
14. Roger, A. Morse, The ABC and XYZ of Bee Culture, A.I. Root & Co., Medina, Ohio 44256.
15. Metcalf C.L. and W.P. Flint, Destructive and Useful Insects, Tata McGraw Hill Publishing Co. Ltd., New Delhi - 110 051
16. Bomford, Mason and Swash, Hutchinson's Clinical Methods, Beilliers Tindal, ELBS edition
17. Gorbman, A., Dickhoff, W.W., Vigna, S.R., Clark, N.B. and Ralph, C.L. Comparative Endocrinology, John Wiley & Sons Inc., New York
18. Beauchamp, T.L. and J.F. Chidress. Principles of Biomedical ethics. Oxford University Press.
19. Nayar, B.V., Pest Management and Pesticides Indian Scenario, Namratha Publications, Madras
20. Odum : Ecology (Amerind)
21. Odum : Fundamentals of Ecology (W.B. Saunders)

22. Ricklefy : Ecology (W.H. Freeman)
23. Turk and Turk : Environmental Science (W.B. Saunders)
24. Dobzhansky, Ayala & Valentine : Evolution (W.H. Freeman)
25. Dobzhansky : Genetics and Origin of species (Columbia University Press)
26. Major : Population, Species & Evolution
27. White : Animal Cytology & Evolution.