

According to the Latest Syllabi of KUK, MDU, CDLU and IGU



ZOOLOGY

B.Sc. – Second Year [4th Semester]

M.L. Bansal

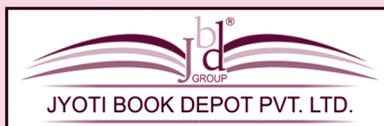
M.Sc., Ph.D., LL.B. (Gold Medalist)
Former Head, Deptt. of Zoology
Government College
Karnal

Gagan Mittal

M.Sc. (Hons), Ph.D.
Head, Deptt. of Zoology
R.K.S.D. College
Kaithal



2020–2021



ISBN : 978-93-87795-23-5

"With the Blessings of Mata Sri Naina Devi Ji"

Published by :

JYOTI BOOK DEPOT PVT. LTD.

295, Ibrahim Mandi, Karnal (HARYANA)

Phone : 0184-2241119, 2241694

Branch Office :

JBD Complex

Near Doaba Chowk, Jalandhar City (PUNJAB)

Phone : 0181-2491848, 2294444

First Edition 2018-2019

Third Revised Edition 2020-2021

[According to the Latest Syllabi Issued by KUK, MDU]

Price : ₹ 439-00

Laser Typesetting :

JYOTI BOOK DEPOT PVT. LTD.

295, Ibrahim Mandi,

Karnal (HARYANA)

Printed at :

JBD Printing Press

A Unit of Jyoti Book Depot Pvt. Ltd.

JBD Complex, Jalandhar City (PUNJAB)

Every effort has been made to avoid errors and omissions in this book. Any error or mistake noted may be brought to the notice of the publisher, which shall be taken care of in the next edition of this book. It is notified that neither the publisher nor the author will be responsible for any mistake, error or omission in this book.

"This book is meant for educational and learning purposes. The author(s) of the book has/have taken all reasonable care to ensure that the contents of the book do not violate any existing copyright or other intellectual property rights of any person in any manner whatsoever. In the event the author(s) has/have been unable to track any source and if any copyright has been inadvertently infringed, please notify the publisher in writing for corrective action..."

© Jyoti Book Depot Pvt. Ltd.

No part of this book may be reproduced or copied in any form or by any means [graphic, electronic or mechanical including photocopying, recording, taping or information retrieval systems] or reproduced on any disc, tape, perforated media or other information storage devices, etc. without the written permission of the publisher. Breach of this kind is liable for legal action.

CONTENTS

SECTION - A : LIFE AND BIODIVERSITY OF CHORDATES-II

1. Class Amphibia: Important Characters, Classification and Examples	1/1- 1/28
1.1 Introduction	1/1
1.2 Amphibians	1/1
1.3 General Characters of the Members Belonging to Class Amphibia	1/2
1.4 Important Examples of the Members Belonging to Class Amphibia	1/9
2. Class Amphibia in General	2/1 - 2/14
2.1 Origin and Evolution of Amphibians	2/1
2.2 Breeding Habits of Amphibia	2/5
2.3 Parental Care in Amphibians	2/6
2.4 Neoteny and Paedogenesis	2/10
2.5 Economic Importance of Amphibians	2/12
3. <i>Rana tigrina</i>	3/1 - 3/70
3.1 Introduction	3/1
3.2 <i>Rana tigrina</i>	3/1
3.3 External Characters	3/4
3.4 Integumentary System	3/6
3.5 Coelom and Viscera	3/8
3.6 Endoskeleton	3/9
3.7 Digestive System of Frog	3/19
3.8 Respiratory System of Frog	3/23
3.9 Sound Producing Organ (Laryngo-tracheal Chamber)	3/28
3.10 Circulatory System of Frog	3/28
3.11 Nervous system of Frog	3/42
3.12 Sense Organs or Receptors	3/56
3.13 Urino-Genital System of Frog	3/63
3.14 Endocrine System	3/67
3.15 Adaptations	3/67
4. Class Reptilia: Characters, Classification, Examples and Economic Importance	4/1- 4/52
4.1 Introduction	4/1
4.2 General Characters of Class Reptilia	4/1
4.3 Advancements over Amphibians	4/2
4.4 Classification of Class Reptilia	4/3
4.5 Important Examples of Members of Class Reptilia	4/11
4.6 Snakes	4/25
4.7 Some Important Examples of Snakes	4/34
4.8 Crocodilians	4/46
4.9 Economic Importance of Reptiles	4/50

5. Class Reptilia: Origin, Evolution, Some Extinct Reptiles	5/1 – 5/12
5.1 Origin of Reptiles	5/1
5.2 Evolution of Reptiles	5/2
5.3 Extinct Reptiles	5/6
6. <i>Hemidactylus</i>: The Common Wall Lizard	6/1 – 6/38
6.1 <i>Hemidactylus</i>	6/1
6.2 External Characters	6/2
6.3 Endoskeleton of a Lizard	6/5
6.4 Digestive System	6/18
6.5 Respiratory System	6/21
6.6 Blood Vascular System	6/22
6.7 Nervous System	6/28
6.8 Sense Organs	6/32
6.9 Urino-genital System	6/34
6.10 Adaptations	6/37
7. Class Aves: Characters, Classification, Examples and Economic Importance	7/1 – 7/40
7.1 Introduction	7/1
7.2 General Characters and Unique Features of Class Aves	7/1
7.3 Advancements of Birds over Reptiles	7/3
7.4 Classification of Class Aves	7/4
7.5 Some Important Examples of Class Aves	7/15
7.6 Economic Importance of Birds	7/37
8. Class Aves: General Account	
Origin and Evolution, Bird Migration, Beaks and Feet, Flight Adaptations, Birds as Glorified Reptiles, Principles of Flight	8/1– 8/22
8.1 Origin and Evolution of Birds	8/1
8.2 Origin of Flight	8/4
8.3 Principles of Aerodynamics in Bird Flight	8/5
8.4 Bird Migration	8/8
8.5 Beaks and Feet	8/14
8.6 Birds are Glorified Reptiles	8/18
8.7 Adaptations of Birds to Aerial Life or Aerial or Flight Adaptations	8/19
8.8 Some Interesting Facts about Birds	8/20

9. <i>Columba livia</i>: The Pigeon	9/1 – 9/60
9.1 Systematic Position	9/1
9.2 External Characters	9/2
9.3 Skin or Integument	9/3
9.4 Exoskeleton	9/4
9.5 Endoskeletal System (Endoskeleton)	9/10
9.6 Coelom and Viscera	9/26
9.7 Muscular System	9/26
9.8 Digestive System	9/29
9.9 Respiratory System	9/32
9.10 Circulatory System	9/39
9.11 Nervous System	9/46
9.12 Urinogenital System	9/55
10. Class Mammalia: Characters, Classification, Examples and Economic Importance	10/1 – 10/54
10.1 Introduction	10/1
10.2 General Characters	10/1
10.3 Classification	10/4
10.4 Outline Classification of Class Mammalia	10/11
10.5 Economic Importance of Chondrichthyes	10/12
10.6 Important Mammals	10/15
10.7 Affinities of Monotremata	10/48
10.8 Affinities of Marsupialia	10/50
11. Mammalia in General	11/1 – 11/20
11.1 Dentition in Mammals	11/1
11.2 Adaptive Radiation in Mammals	11/9
11.3 Anatomical Adaptations	11/11
11.4 Adaptive Convergence in Mammals	11/14
11.5 Origin and Ancestry of Mammals	11/17
12. <i>Rattus rattus</i>	12/1 – 12/76
12.1 Introduction	12/1
12.2 Habitat	12/1
12.3 Habits	12/1
12.4 External Features	12/2
12.5 Body Wall	12/8
12.6 Skeletal System	12/13
12.7 Digestive System	12/30
12.8 Respiratory System	12/41

12.9 Circulatory System	12/45
12.10 Blood	12/57
12.11 Lymphatic System	12/58
12.12 Nervous System	12/59
12.13 Sense Organs	12/68
12.14 Endocrine System	12/80
12.15 Urinogenital System	12/83

SECTION – B : MAMMALIAN PHYSIOLOGY-II

13. Body Fluids and Circulation	13/1 – 13/52
13.1 Introduction	13/1
13.2 Body Fluids	13/1
13.3 Functions of Circulatory System	13/3
13.4 Types of Circulation	13/3
13.5 Types of Blood Vascular System (Circulatory Pathways)	13/6
13.6 Heart in Vertebrates	13/8
13.7 Brief Description of Mammalian Heart	13/11
13.8 Blood Pressure (BP)	13/21
13.9 Blood	13/25
13.10 Blood Groups and Blood Transfusion	13/32
13.11 Blood Coagulation (Hemostatic Mechanism)	13/33
13.12 Haemopoiesis	13/39
13.13 Tissue Fluid (Interstitial Fluid)	13/46
13.14 Common Disorders of Circulatory System	13/47
14. Respiration	14/1 – 14/54
14.1 Introduction	14/1
14.2 Respiration	14/1
14.3 Respiratory Gases and Principles of Exchange of Gases	14/6
14.4 Mammalian Lungs	14/14
14.5 Mechanism of Pulmonary Respiration (Breathing Mechanism) in Mammals (Man)	14/16
14.6 Control and Regulation of Respiration	14/31
14.7 Few Common Respiratory Disorders	14/33
14.8 Cellular Respiration	14/35
14.9 Mechanism of Anaerobic Respiration	14/47
14.10 Pentose Phosphate Pathway	14/50
14.11 Amphibolic Pathway	14/52

15. Excretion and Osmoregulation	15/1 – 15/40
15.1 Introduction	15/1
15.2 Excretion	15/1
15.3 Excretory Products (Metabolic Wastes) in Animals	15/2
15.4 Excretory and Osmoregulatory Organs of Protozoans, Sponges and Coelenterates	15/6
15.5 Excretory and Osmoregulatory Organs of Higher Invertebrates	15/7
15.6 Human Excretory System	15/11
15.7 Physiology of Excretion (Urine Formation)	15/15
15.8 Urine	15/22
15.9 Water Conservation and Production of Concentrated Urine	15/23
15.10 Osmoregulation by Kidneys (Regulation of Kidney Function by Feedback Circuits)	15/25
15.11 Some Disorders of Kidney	15/27
15.12 Dialysis (Artificial Kidney)	15/28
15.13 Kidney Transplantation	15/29
15.14 Accessory or Additional Excretory Organs	15/30
15.15 Osmoregulation	15/31
16. Neural Integration	16/1 – 16/28
16.1 Introduction	16/1
16.2 Structure of Nervous Tissue	16/1
16.3 Classification of Neurons	16/6
16.4 Nerve	16/9
16.5 Reflex Action	16/11
16.6 Nerve Impulse Conduction	16/13
16.7 Membrane Potentials	16/13
16.8 Conduction of Action Potentials	16/18
17. Endocrine Glands	17/1 – 17/72
17.1 Introduction	17/1
17.2 Glands	17/1
17.3 Endocrinology	17/3
17.4 Hormones	17/4
17.5 The Endocrine Glands	17/13
18. Reproduction	18/1 – 18/48
18.1 Introduction	18/1
18.2 Reproductive System	18/1
18.3 Gametogenesis	18/8
18.4 Hormonal Control of Gametogenesis	18/17
18.5 Structure of Gametes	18/19
18.6 Female Reproductive/Sexual Cycle	18/23
18.7 Fertilization	18/29
18.8 Post Fertilization Events or Human Embryogenesis	18/33
18.9 Placenta Formation	18/36
18.10 Gestation	18/41
18.11 Parturition	18/43