## ATEXTBOOK OF ZOOLOGY





R. D. Vidyarthi P.N. Pandey



## **CONTENTS**

Cha	pter	Pages
	PART—1	_
	INTRODUCTION	
1.	Introduction : Science, Biology & Animals	117
	Science; Nature; Manifestation of matter and energy; Energy; Living matter, Biology; Life and its characteristics; Differences between two categories of living objects; Interdependence of organisms; Zoology; Animals; Revision Questions.	
2.	Origin of Life	18—28
	Theories of origin of life; Oparin's theory of origin of life; Possibilities of life on other planets; Revision Questions.	
3.	Viruses	29—36
	Characteristics of viruses; Structure of viruses; Life cycle of virus; Host's defence against viral infection; Nature of viruses; Significance of viruses in origin of life; Economic importance of viruses; Revision Questions.	
4.	Life Substance : The Protoplasm	3750
	Structure of protoplasm; Carbohydrates; Lipids; Proteins; Nucleic acids; Enzymes; Hormones; Vitamins; Inorganic substances; Properties of protoplasm; Revision Questions.	
5.	Cells: Biological Units	5168
	Ultra structure of true animal cell; Plant cell vs Animal cell; Revision Questions.	
6.	Cell Division	69—81
	Historical account of cell division; Basis of cell division; Cell cycle; Types of division; Amitosis; Mitosis or Karyokinesis; Meiosis; Gametogenesis; Revision Questions.	
7.	Tissues	82—110
	Epithelium; Connective tissue; Muscular tissue; Nervous tissue; Organs and organ-systems; Revision Questions.	
8.	Classification, Nomenclature and General Survey of Animals	111-121
	Classification; Nomenclature: the binomial nomenclature; General survey of animals; Revision Questions.	
9.	Classification of Animal Kingdom	122—149
	Phylum: Protozoa; Phylum Porifera; Phylum Coelenterata; Phylum: Ctenophora; Phylum: Platyhelminthes; Phylum: Nematoda; Phylum: Annelida; Phylum: Mollusca; Phylum: Arthropoda; Phylum: Echinodermata; Phylum: Hemichordata; Phylum: Chordata; Subphylum: Urochordata; Subphylum: Cephalochordata; Group: Craniata; Class: Cyclostomata; Class: Chondrichthyes; Class: Osteichthyes; Superclass: Tetrapoda; Class: Amphibia; Class: Reptilia; Class: Aves; Class: Mammalia; Facts to remember; Revision Questions.	

## PART—2

## **CELL PHYSIOLOGY**

10.	Cell Metabolism	150161
	Metabolism; Enzymes; Revision Questions.	
11.	Metabolism of Nutrients	162-175
	Metabolism of carbohydrate; Metabolism of protein; Metabolism of fat; Revision Questions.	
	PART—3	
	FROG	
12.	Frogs and Toads in General	176181
	Kinds of Frogs and Toads; Differences between frogs and toads; Revision Questions.	
13.	Habitat and Habits of Frog	182188
	Habitat; Habits; Revision Questions.	
14.	External Features of Frog	189—192
	Divisions of body; Revision Questions.	
15.	Internal Structures of frog	193197
	Visceral structures; Revision Questions.	
16.	Skin of Frog	198202
	Structure; Functions of the skin of frog; Revision Questions.	
17.	Digestive System of Frog	203222
	Alimentary canal; Microscopic structure of alimentary canal; Associated glands; Classes of food; Uses of food; Necessity and purpose of digestion; Chemistry of digestion; Absorption of digested food; The fate of different food materials; Revision Questions.	
18.	Respiratory System of Frog	223230
	Cutaneous respiration; Bucco-pharyngeal respiration; Pulmonary respiration; Physiology of respiration; Sound production; Revision Questions.	
19.	Circulatory System of Frog	231—254
	Blood vascular system; Structure and general functions of blood; Heart; Blood vessels; Arterial system; Venous system; Lymphatic system; Spleen; Revision Questions.	
20.	Excretory System of Frog	255-261
	Organs of excretion; Blood supply to Kidneys; Physiology of excretion; Other means of excretion; Revision Questions.	
21.	Nervous System of Frog	262277
	The cerebro-spinal system; Central nervous system; Peripheral nervous system (brain, spinal cord and nerves); The autonomic nervous system (sympathetic	

	and parasympathetic); Reflex actions; Revision Questions.	
22.	Skeleton of Frog	278299
	Types of skeleton; Endoskeleton of frog; Axial skeleton; Appendicular skeleton; Homology and analogy; Revision Questions.	
23.	Joints, Muscles and Movement	300-306
	Joints; Muscles; Revision Questions.	
24.	Receptor Organs of Frog	307—317
	Tangoreceptors; Olfactoreceptor; Gustatoreceptor; Photoreceptor; Acousticoreceptor; Revision Questions.	
25.	Reproductive System of Frog	318—321
	Male reproductive organs; Female reproductive organs; Revision Questions.	
26.	Fertilization and Development of Frog	322340
	Ripe ova; Fertilization and its effects; Cleavage or segmentation; Gastrulation; Neurulation; Fate of primary germinal layers; Pretadpole stage; Hatching; Metamorphosis; Recapitulation theory; Activities; Revision Questions.	
	PART—4	
	RABBIT AND OTHER VERTEBRATES	
27.	Class Mammalia : Rabbit	341—349
	General characters of the class mammalia; Rabbit; Rabbit and hare; External features of rabbit; The general arrangement of viscera; Revision Questions.	
28.	Rabbit Skin	350357
	Structure; Skin derivatives; Modifications of cutaneous glands; Functions of skin; Revision Questions.	
29.	Rabbit : Skeleton System	358—381
	Axial skeleton; Appendicular skeleton; Functions of the endoskeleton; Revision Questions.	
30.	Rabbit : Digestive System	382-411
	Alimentary canal; Associated glands; Digestive system of man; Food; Ingestion and digestion; Absorption of digested food; Fate of digested food; Revision Questions.	
31.	Rabbit : Respiratory System	412-422
	Respiratory structures; Ventilation movements; Gaseous exchange; Distribution of O <sub>2</sub> and collection of CO <sub>2</sub> ; Physiology of respiration; Revision Questions.	
32	Rabbit : Circulatory System	423446
	Blood vascular system; Heart; Venous system; Arterial system; Blood; Functions of blood; Coagulation of blood; Blood groups and transfusion; Blood bank; Blood pressure; Lymphatic system; Revision Questions.	
33.	Rabbit: Excretory System Kidneys; Excretory structures associated with kidneys; Other excretory structures;	447—457

	Chief functions of kidneys; Excretory physiology of kidneys; Osmoregulation by kidneys; Kidney machine; Revision Questions.	
34.	Rabbit : Nervous System	458480
	Central nervous system; Functions of the brain; Cranio-spinal system (cranial and spinal nerves); Autonomic nervous system (structure and functions); Nerve impulse and its conduction; Reflex actions; Revision Questions.	
35.	Rabbit : Receptor Organs	481-495
	Eye; Common defects of eyes; Ear (structure and hearing); Organs of smell and taste; Cutaneous sense organs; Revision Questions.	
36.	Endocrine System	496511
	Hormones (chemical nature, functions and type); Comparison between nervous and endocrine systems; Endocrinology; Endocrine glands (pituitary, thyroid, parathyroid, thymus, pancreas, adrenal, sex glands, gastro-intestinal mucosa, pineal gland and placenta); Revision Questions.	
37.	Rabbit : Reproductive System	512533
	Male reproductive organs; Female reproductive organs; Types of ova in animals; Embryonic membranes; Human reproductive system; Fertilisation in human being; Revision Questions.	
38.	Rabbit : Fertilization and Development	534540
	Ovum and sperm; Fertilization; Foetal membrane; Parturition; Artificial insemination; Test tube babies; Revision Questions.	
39.	Phylum Chordata	541545
	Invertebrate chordates or protochordata; Vertebrate chordate; Revision Questions.	
40.	Mammalia : General Survey	546555
	Prototheria; Metatheria; Eutheria; Revision Questions.	
41.	Other Vertebrates : Fishes, Amphibians and Reptiles	556571
	True fishes; Chondrichthyes vs Osteichthyes; Common fresh water fishes; Amphibians; Reptiles; Order lacertilia; Order ophidia; Order crocodilia; Revision Questions.	
42.	Vertebrate : Aves	572—585
	External features; Respiratory organs; Alimentary canal; Skeleton; Urinogenital organs; Adaptations to flight; Classification; Revision Questions.	
	PART—5	
	INVERTEBRATES	
43.	Invertebrates (Invertebrata)	586588
	General characteristics; Comparison between invertebrates and vertebrates; Revision Questions.	
44.	Phylum Protozoa : Amoeba	589602
	Amoeba; Immortality of Amoeba; Entamoeba histolytica; Entamoeba coli; Entamoeba gingivalis; Revision Questions.	
45.	Phylum Protozoa : Paramecium	603611
•	Habitat and habit; Structure; Locomotion; Nutrition; Excretion; Osmoregulation;	

	Reproduction; Revision Questions.	
46.	Parasitic Protozoa: Malaria Parasite, Monocystis and Balantidium	612—623
	Type 1: Malaria parasite; History of discovery; Life-history of Plasmodium vivax; Gamongony or sexual reproduction; Sporogony; Types of malaria and parasites; Control of malaria; Type 2: Monocystis; Type 3: Balantidium coli.	
47.	Phylum Porifera : Leucosolenia	624632
	Habit and habitat; External organisation; Histology; Importance of water; Reproduction; Development; Classification; Revision Questions.	
48.	Phylum Coelenterata (Cnidaria) : Hydra	633650
	Structure of Hydra; Locomotion; Food and feeding; Respiration and excretion; Reproduction; Revision Questions.	
49.	Phylum Coelenterata : Obelia	651661
	Hydroid colony; Medusae; Alternation of generations; Polymorphism; Classification; Revision Questions.	
50.	Phylum Platyhelminthes: Fasciola hepatica and Taenia Solium	662677
	Fasciola hepatica; Habitat; External morphology; Taenia solium-the pork tapeworm; Parasitic adaptation; Revision Questions.	
51.	Phylum Aschelminthes: Ascaris	678—689
	Ascaris lumbricoides; Alimentary canal; Respiration; Excretory system; Reproductive system; Life history; Nervous system; Relation of Ascaris to man; Classification; Revision Questions.	
52.	Phylum Annelida: Neanthes	690701
	External features; Body wall; Coelom; Locomotion; Digestive system; Respiration; Excretory system; Receptor organs; Reproductive system; Revision Questions.	
53.	Phylum Annelida: Earthworm	702—728
	Earthworms; Pheretima posthuma; Body wall; Locomotion; Coelom; Digestive system; Respiration; Excretory organs; Vascular system; Nervous system; Receptor organs; Reproductive organs; Revision Questions.	
54.	Phylum Arthropoda: Cockroach	729754
	Distinguishing features of phylum arthropoda; Distinguishing features of class insecta; Habitat and habit; External features; Body wall; Alimentary canal; Circulatory system; Respiratory system; Excretory system; Neurosensory system; Reproductive system; Revision Questions.	
55.	Phylum Arthropoda: Mosquito	755766
	External features; Alimentary canal; Life-history of Culex; Economic importance of mosquito; Prevention and control of malaria; <i>Revision Questions</i> .	
56.	Lobster	767788
	External features; Digestive system; Circulatory system; Respiratory system; Excretory system; Reproductive system; Nervous system; Receptors; Autotomy; Regeneration; Revision Questions.	
57.	Other Insects of Economic Importance	789—809
	Silkworm or silk moth; Honey bee; Large white butterfly; Other insects in	

	relation to man; Classification of arthropoda; Exopterygote insects; Endopterygote insects; Revision Questions.	
58.	Phylum Mollusca Class Pelecypoda; Class Gastropoda; Class Cephalopoda; Revision Questions.	810813
59.	Phylum Echinodermata	814816
57.	Classification; Revision Questions.	014010
	PART—6	
	HEREDITY, EVOLUTION AND ECOLOGY	
60.	Chromosomes: The Bearers of Genes	817825
	Historical background of chromosomes; Number of chromosomes; Morphology of chromosomes; Materials of chromosomes; Chemical or molecular composition of chromosomes; Types of chromosomes; Giant chromosomes; Functions of chromosomes; Revision Questions.	91, <b>V40</b>
61.	Nucleic Acids and Protein Synthesis	826—836
	DNA; RNA; Genetic code; Stages of protein synthesis; Revision Questions.	
62.	Heredity	837855
	Mendel and his discoveries; Mendel's experiments; Mendelian heredity in animals; Exceptions to Mendelian laws; Modern basis of heredity; Determination of sex; Sex-linkage; Economic aspects of Mendelism; Revision Questions.	
63.	You and Heredity	856863
	Sex-linked traits; Eugenics and Euthenics; Revision Questions.	
64.	Evolution	864886
	Evidences of evolution; Evidence from comparative anatomy; Embryological evidence; Paleontological or geological evidence; Evidence from geographical distribution; Evidence from physiology and biochemistry; Theories of evolution; Variation; Causes of mutations; Revision Questions.	
65.	The Origin and Evolution of Man	887892
	Fossil remains of primitive man; Earlier human remains; Full brained man; Revision Questions.	
66.	Ecosystem and Population	893900
	Ecosystem; Structure of ecosystem; Food chains and trophic levels; Population; The balance of nature; Environmental factors; Revision Questions.	
67.	Wildlife and Conservation	901911
	Importance of wild life; Important wild animals of India; List of endangered wild animals of India; Reasons for decline of wild life; Conservation of wildlife; Important shelters of wild animals; Revision Questions.	
Answers to multiple choice questions		912917
Glossary		918932