

PART - B: CORE SUBJECT IN ZOOLOGY

Unit-I

Taxonomy: Principles and methods of taxonomy, Nomenclature - Binomial, Trinomial nomenclature, Levels of structural organization, Classification of animals and microorganisms, **Comparative anatomy:** Brain, Heart, Aortic Arches, Integument, Respiratory system, Digestive system and Urino-genital system of Vertebrata. **Molecules and their Interaction:** Structure of atoms, molecules, and chemical bonds, Composition, structure, and function of biomolecules, Stabilizing interactions,

Unit-II

Biophysical Chemistry: Principles of biophysical chemistry, Bioenergetics, glycolysis, oxidative phosphorylation, coupled reaction. Principles of catalysis, enzymes and enzyme kinetics, enzyme regulation, mechanism of enzyme catalysis, isozymes, **Dynamic Organization of Cell:** Membrane structure and function, Structural organization and function of intracellular organelles, Organization of genes and chromosomes, Cell division and cell cycle.

Unit-III

Fundamental Processes: DNA replication, repair, and recombination, RNA synthesis and processing, Protein synthesis and processing, and Control of gene expression at transcription and translation level. **Cell Communication and Cell Signaling:** Regulation of hematopoiesis, general principles of cell communication, cell adhesions, gap junctions, extracellular matrix, integrins, neurotransmission and its regulation. Cancer, and Innate and adaptive immune system

Unit-IV

Developmental Biology: Basic concepts of development, Gametogenesis, fertilization, and early development, Morphogenesis and organogenesis in animals, Programmed cell death, aging, and senescence. **Animal Physiology:** Blood and Circulation, Cardiovascular system, Respiratory system, Nervous System, Sense Organs, Excretory system, Thermoregulation, Stress and Adaptation, Digestive System, and Endocrinology and Reproduction. **Inheritance Biology:** Mendelian principles, Concept of Gene, Gene mapping methods, Microbial genetics, Human Genetics and Recombination,

Unit- V

Molecular Evolution: Concepts of neutral evolution, molecular divergence and molecular clocks; Molecular tools in phylogeny, classification and identification; Protein and nucleotide sequence analysis; origin of new genes and proteins; Gene duplication and divergence. **Ecology and Conservation Biology:** The Environment, Habitat and Niche, Population

Ecology, Species Interactions, Community Ecology, Ecological Succession, Ecosystem Ecology, Biogeography, Applied Ecology, Conservation Biology, Environmental Pollution and Control.

References:

1. Jonathan M. W. Slack, 2006. Essential Developmental Biology.
2. Gilbert S. F., and K. Knisely, 2009. Developmental Biology, Sinauer Associates Inc.
3. Minelli A., 2009. Forms of Becoming: The Evolutionary Biology of Development, Princeton University Press.
4. Berry A.K. 2007. An Introduction to Embryology, Emkay Publications, New Delhi
5. Hake S and Wilt F., 2003. Principles of Developmental Biology, W.W. Norton & Co.,
6. Linda S. Costanzo, 2017. Physiology, (6th ed.): Elsevier.
7. Rastogi, S.T. 1988. Essentials of Animal Physiology. Madras: Wiley, Eastern Limited.
8. Richard W. Hill., Gordon A. Wyse., Anderson, M. 2012. Animal Physiology, (3rd ed.): Sinauer Associates, Inc.
9. Verma, P.S, Tyagi, B.S and Agarwal, U.V 2005. Animal Physiology. New Delhi: S.Chand & Company Ltd.
10. Chapman, J. L., and Reiss, M. J. 2018. Ecology: Principles and applications. Cambridge University Press.
11. Chiras, D. D. 2009. Environmental science. Jones & Bartlett Publishers.
12. Ganguly, B.B., Sinha, A.K., and Adhikari, S. 1988. Biology of Animals. Kolkata: New Central Book Agency.
13. Hickman, C., Roberts, L., Keen, S., Larson, A and Eisenhour, D. 2018. Animal Diversity (5th ed.): McGraw-Hill, Custom for Oakland University edition.