

# BIOLOGY

For Class-XII

## 14. RESPIRATION

- 14.1 Respiratory System of Man
  - 14.1.1 Air Passage Way and Lungs
  - 14.1.2 Mechanism of Breathing
  - 14.1.3 Respiratory Volumes
  - 14.1.4 Transport of Gases (Transport of Oxygen and Carbon dioxide)
- 14.2 Respiratory Disorders
  - 14.2.1 Upper Respiratory Infections (Sinusitis, Otitis Media)
  - 14.2.2 Lower Respiratory Infections and Disorders (Pneumonia, Emphysema, Pulmonary Tuberculosis, Lung Cancer)

## 15. HOMEOSTASIS

- 15.1 Osmoregulation (in Freshwater, Marine and Terrestrial Environments)
- 15.2 Excretion
  - 15.2.1 Relationship between Excretory Products and Habitat
- 15.3 Excretory System of Man
  - 15.3.1 Structure and Function of Kidney
- 15.4 Disorders of Urinary Tract
  - 15.4.1 Urinary Tract Infections
  - 15.4.2 Kidney Stones (Causes and Treatments)
  - 15.4.3 Kidney Failure (Causes and Treatments)
    - 15.4.3.1 Dialysis; Mechanism and Problems
    - 15.4.3.2 Kidney Transplant; Process and Problems
- 15.5 Thermoregulation

## 16. SUPPORT AND MOVEMENT

- 16.1 Human Skeleton (Axial Skeleton, Appendicular Skeleton, Types of Joints)
- 16.2 Disorders of Skeleton (Disc slip, Spondylosis, Sciatica, Arthritis, Bone Fractures)
- 16.3 Muscles (Smooth Muscles, Cardiac Muscles and Skeletal Muscles)
  - 16.3.1 Ultra-structure of Skeletal Muscles
  - 16.3.2 Antagonistic Arrangement of Skeletal Muscles
  - 16.3.3 Muscle Contraction - Sliding Filament Model

## 17. NERVOUS COORDINATION

- 17.1 Nervous System of Man
  - 17.1.1 Steps involved in nervous coordination
  - 17.1.2 Neurons (Structure and Types)
  - 17.1.3 Nerve Impulse
  - 17.1.4 Transmission of Action Potential between Cells – Synapse
  - 17.1.5 Basic Organization of human nervous system (CNS and PNS)
  - 17.1.6 Sensory Receptors and their working (Receptors for Smell, Tastes and Touch, Pain etc)
- 17.2 Effects of Drugs on Nervous Coordination (Effects of Heroine, Nicotine, Caffeine, Alcohol and inhalants – Nail polish remover and Glue)
- 17.3 Disorders of Nervous System
  - 17.3.1 Vascular Disorders (Stroke, Hematoma)
  - 17.3.2 Infections (Meningitis, Encephalitis)
  - 17.3.3 Structural Disorders (Brain or Spinal Cord Injury, Brain or Spinal Cord Tumors)
  - 17.3.4 Functional Disorders (Headache, Epilepsy, Neuralgia)
  - 17.3.5 Degenerative Disorders (Parkinson's Disease, Multiple Sclerosis, Huntington's Disease, Alzheimer's Disease)
  - 17.3.6 Diagnostic Tests for Nervous Disorders (EEG, CT Scan and MRI)

- 18. **CHEMICAL COORDINATION**
  - 18.1 Hormones- The chemical messengers
  - 18.2 Endocrine System of Man (Glands with location, secretions and imbalance)
    - 18.2.1 Pituitary gland and the Role of Hypothalamus
    - 18.2.2 Thyroid
    - 18.2.3 Parathyroid
    - 18.2.4 Pancreas
    - 18.2.5 Adrenal
    - 18.2.6 Gonads
    - 18.2.7 Other Endocrine Tissues / Cells
  - 18.3 Feedback Mechanism
- 19. **BEHAVIOR**
  - 19.1 The nature of Behavior
  - 19.2 Innate Behavior
  - 19.3 Learning
  - 19.4 Social Behavior
- 20. **REPRODUCTION**
  - 20.1 Reproductive System of Man
    - 20.1.1 Male Reproductive System and its Hormonal Regulation
    - 20.1.2 Female Reproductive System and its Hormonal Regulation
  - 20.2 Disorders of Reproductive System (Infertility, Imbalance of Male Sex Hormones)
  - 20.3 Sexually Transmitted Diseases (Syphilis, Gonorrhoea, AIDS)
- 21. **DEVELOPMENT AND AGING**
  - 21.1 Embryonic Development (Cleavage, Gastrulation, Neurulation)
  - 21.2 Control of Development (Role of Nucleus, Cytoplasm and Neighboring cells)
  - 21.3 Human Embryonic Development
  - 21.4 Birth and Nursing
  - 21.5 Disorders during Embryonic Development
  - 21.6 Postnatal Development
  - 21.7 Aging
- 22. **INHERITANCE**
  - 22.1 Law of Independent Assortment
    - 22.1.1 Probabilities
  - 22.2 Incomplete Dominance, Multiple Alleles and Co-dominance
  - 22.3 ABO Blood Group System
  - 22.4 Rh Blood Group System and *Erythroblastosis foetalis*
  - 22.5 Polygenic Inheritance and Epistasis
  - 22.6 Gene Linkage and Crossing Over
  - 22.7 Sex Determination (XX-XY System, ZW-ZZ System and XX-XO System)
  - 22.8 Sex Linkage
    - 22.8.1 Sex Linkage in *Drosophila* and Man
    - 22.8.2 X-linked Disorders – Color Blindness, Hemophilia, Muscular Dystrophy
    - 22.8.3 Sex-limited and Sex-Influenced Traits
- 23. **CHROMOSOME AND DNA**
  - 23.1 Chromosomal Theory of Inheritance
  - 23.2 DNA as the Hereditary Material
  - 23.3 DNA Replication
    - 23.3.1 Meselson and Stahl Experiment
    - 23.3.2 Mechanism of DNA Replication

- 23.4 Gene Expression
  - 23.4.1 Genetic Code
  - 23.4.2 Transcription
  - 23.4.3 Translation
- 23.5 Regulating Gene Expression
- 23.6 Mutations
  - 23.6.1 Chromosomal Mutations
  - 23.6.2 Gene Mutations
- 24. EVOLUTION**
  - 24.1 The evolution of the concepts of evolution
  - 24.2 Evidences of evolution
  - 24.3 Evolution from Prokaryotes to Eukaryotes
  - 24.4 Lamarckism
  - 24.5 Darwinism
  - 24.6 Neo-Darwinism
- 25. MAN AND HIS ENVIRONMENT**
  - 25.1 Biogeochemical Cycle (Water Cycle and Nitrogen Cycle)
  - 25.2 The Flow of Energy (Productivity, Trophic levels)
  - 25.3 Ecological Succession
  - 25.4 Population Dynamics
  - 25.5 Human Impacts on Environment
    - 25.5.1 Nuclear Power
    - 25.5.2 CO<sub>2</sub> and Global Warming
    - 25.5.3 Acid Rain
    - 25.5.4 Ozone Depletion
    - 25.5.5 Common pollution sources
  - 25.6 Environmental Resources and their Depletion
- 26. BIOTECHNOLOGY**
  - 26.1 Gene Cloning (Recombinant DNA Technology and Polymerase Chain Reaction)
  - 26.2 DNA Sequencing
  - 26.3 DNA Analysis
  - 26.4 Genome Maps
  - 26.5 Tissue Culture
  - 26.6 Transgenic Bacteria, Plants and Animals
  - 26.7 Biotechnology and Healthcare
  - 26.8 Scope and Importance of Biotechnology
- 27. BIOLOGY AND HUMAN WELFARE**
  - 27.1 Vaccination and Integrated disease management
  - 27.2 Animal Husbandry
  - 27.3 Latest techniques applied to enhance crop and fruit yields
  - 27.4 Home Gardening
  - 27.5 Role of Microbes in Human Welfare