

## BIOLOGY

### DIVERSITY IN LIVING WORLD

- Diversity of living organism.
- Classification of the living organisms (five kingdom classification, major groups principles of classification within each kingdom).
- Systematics and binomial system of nomenclature.
- Salient features of animal (non chordates up to phylum level, and chordates up to class level) and plant (major groups; Angiosperms up to subclass) classification.
- Botanical garden, herbaria, zoological parks museums.

### STRUCTURAL ORGANISATION IN ANIMALS AND PLANTS

Tissues in animals and plants.

Morphology, anatomy and functions of different parts of flowering plants : Root, stem, leaf, inflorescence, flower, fruit and seed.

Morphology, anatomy and functions of different systems of an annelid (earthworm), an insect (cockroach) and an amphibian (frog.)

### CELL : STRUCTURE AND FUNCTION

Cell : Cell wall, cell membrane and cell organelles (plastids, mitochondria, endoplasmic reticulum, Golgi bodies/dictyosomes, ribosomes, lysosomes, vacuoles, centrioles) and nuclear organisation.

Mitosis, meiosis, cell cycle.

Basis chemical constituents of living bodies.

Structure and functions of carbohydrates, proteins, lipids and nucleic acids.

Enzymes : Types, properties and function.

### PLANT PHYSIOLOGY

Movement of water, food, nutrients and gases.

Plants and Water : Mineral nutrition

Respiration

Photosynthesis

Plant growth and development

### HUMAN PHYSIOLOGY

Digestion and absorption.

Breathing and respiration

Body fluids and circulation

Excretory products and elimination

Locomotion and movement

Control and coordination

### \* SEXUAL REPRODUCTION

- Pollination and fertilization in flowering plants.
- Development of seeds and fruits.
- Human reproduction : reproductive system in male and female, menstrual cycle. Production of gametes, fertilization, implantation, embryo development, pregnancy and parturition.
- Reproductive health-birth control, contraception and sexually transmitted diseases.

### GENETICS AND EVOLUTION

- Mendelian inheritance.
- Chromosome theory of inheritance, deviations from Mendelian ratio (gene interaction-Incomplete dominance, co-dominance, complementary genes, multiple alleles.)
- Sex determination in human beings: XX, XY.
- Linkage and crossing over.
- Inheritance pattern of haemophilia and blood groups in human beings.

- DNA : replication, transcription, translation.
- Gene expression and regulation.
- Genome and Human Genome Project.
- DNA fingerprinting.

**Evolution** : Theories and evidences.

#### **BIOLOGY AND HUMAN WELFARE**

- Animal husbandry.
- Basic concepts of immunology, vaccines.
- Pathogens, Parasites.
- Plant breeding, tissue culture, food production.
- Microbes in household food processing, industrial production, sewage treatment and energy generation.
- Cancer and AIDS.
- Adolescence and drug/alcohol abuse.

#### **BIOTECHNOLOGY AND ITS APPLIATIONS**

- Recombinant DNA technology.
- Applications in Health, Agriculture and Industry.
- Genetically modified (GM) organism; biosafety issues.
- Insulin and Bt cotton.

#### **ECOLOGY & ENVIRONMENT**

Ecosystems: components, types and energy flow.

Species, population and community.

Ecological adaptations.

Centres of diversity and conservation of biodiversity, national parks and sanctuaries.

Environmental issues.

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