NOTIFICATION

It is notified for information of all concerned that revised curriculum 2006 in the subject of Biology at HSSC level shall stand implemented w.e.f. the academic session 2017-2019. Accordingly, the students to be admitted in class-XI in August 2017 and subsequently promoted to class-XII in August 2018 shall be examined in accordance with the revised curriculum in HSSC Part-I and Part-II examinations to be held in the years 2018 and 2019 respectively. Contents of syllabus of class XI are enclosed herewith.

2. The book to be published by National Book Foundation, Islamabad may be consulted for reference and supplementary material.

3. A copy of the curriculum 2006 in the subjects of Biology for class XI is enclosed and also being hoisted on the FBISE’s website www.fbise.edu.pk for the benefit of all stakeholders.

All heads of institutions affiliated with FBISE at HSSC level

Copy to:
1. Director General, Federal Directorate of Education, G-9/4, Islamabad
2. Director Education, FGEI (C&G), Sir Syed Road, The Mall, Rawalpindi Cantt
3. Director Education (Schools/Colleges), PAF Rear Air HQs, Peshawar Cantt
4. Director Education, Directorate of Naval Educational Services, Naval HQ, Islamabad
5. Director, Army Public Schools and Colleges System Secretariat, GHQ, Rawalpindi
6. General Manager (Education), Fauji Foundation Head Office, Welfare Division, Chaklala, Rawalpindi
7. Director Education, OPF Head Office, F-5, Islamabad
8. The Secretary, National Book Foundation, G-8/4, Islamabad
9. All GSO-I
10. Incharge, Website FBISE, Islamabad
11. Incharge, FBISE Sub-Office, Gilgit
12. All Sectional Heads of FBISE, Islamabad
NOTIFICATION

In accordance with the requirements of the Federal Government and the Secretary of Education, the following notification is being issued:

1. All schools and educational institutions are advised to ensure that all educational activities are conducted in accordance with the guidelines issued by the Federal Government.

2. The schools are advised to keep a record of all activities and submit the same to the concerned authorities on a regular basis.

3. All teachers and staff are advised to follow the health and safety guidelines issued by the Federal Government.

(Signature)

Director (E&D)

Date: 01-07-2023
BIOLOGY
For Class-XI

1. CELL STRUCTURE AND FUNCTION
   1.1 Techniques used in Cell Biology
   1.2 Cell Wall and Plasma Membrane – The Boundary Wall
   1.3 Cytoplasm and Organelles
   1.4 Prokaryotic and Eukaryotic Cells

2. BIOLOGICAL MOLECULES
   2.1 Biological Molecules in Protoplasm
   2.2 Importance of Water (Importance in Protoplasm and in Environment)
   2.3 Carbohydrates
      2.3.1 Classification (Monosaccharides, Disaccharides and Polysaccharides)
      2.3.2 Role of Carbohydrates
   2.4 Proteins
      2.4.1 Structure of Proteins (Amino Acids and Peptide Linkages)
      2.4.2 Classification of Proteins (Globular and Fibrous Proteins)
      2.4.3 Role of Proteins
   2.5 Lipids
      2.5.1 Classification (Acylglycerols, Phospholipids, Waxes and Terpenes)
      2.5.2 Role of Lipids
   2.6 Nucleic Acids
      2.6.1 Structure of Nucleic Acids (Nucleotides and Phosphodiester Linkage)
      2.6.2 Classification (RNA and DNA)
      2.6.3 Role of Nucleic Acids and nucleotides (DNA, RNA, ATP and NAD)
   2.7 Conjugated Molecules (Glycolipids, Glycoproteins, Lipoproteins and Nucleoproteins)

3. ENZYMES
   3.1 Structure of Enzymes
   3.2 Mechanism of Enzyme Action
   3.3 Factors affecting the Rate of Enzymatic Action (Temperature, pH, Enzyme Concentration and Substrate Concentration)
   3.4 Enzyme Inhibition (Competitive and Noncompetitive Inhibitors)
   3.5 Classification of Enzymes

4. BIOENERGETICS
   4.1 Photosynthesis
      4.1.1 Role of Light
      4.1.2 Role of Photosynthetic Pigments – Absorption Spectrum and Action Spectrum
      4.1.3 Role of Carbon dioxide
      4.1.4 Role of Water
      4.1.5 Mechanism of Photosynthesis
   4.2 Cellular Respiration
      4.2.1 Aerobic and Anaerobic respiration
      4.2.2 Mechanism of Respiration
      4.2.3 Synthesis of ATP - Chemiosmosis and Substrate-level phosphorylation
   4.3 Photosynthesis

5. ACELLULAR LIFE
   5.1 Viruses - Discovery and Structure
   5.2 Parasitic Nature of Viruses
   5.3 Life Cycle of Bacteriophage
   5.4 Life Cycle of HIV
   5.5 Viral Diseases (Hepatitis, Herpes, Polio and Leaf curl virus disease of cotton)
   5.6 Prions and Viroids (Structure and examples of Diseases caused by them)

6. PROKARYOTES
   6.1 Taxonomy of Prokaryotes
   6.2 Archaea
   6.3 Bacteria; Ecology and Diversity
   6.4 Structure; Shape and Size of Bacteria
   6.5 Modes of Nutrition in Bacteria
6.6 Growth and Reproduction in Bacteria
6.7 Importance of Bacteria (Beneficial and Harmful bacteria)
6.8 The Bacterial Flora of Humans
6.9 Control of Harmful Bacteria

7. PROTOSTIS AND FUNGI
7.1 Protists – The Evolutionary Relationships
7.2 Major groups of Protists (protozoa, algae, myxomycota, oomycota)
7.3 General characteristics of Fungi
7.4 Diversity among Fungi (zygomycota, ascomycota, basidiomycota)
7.5 Importance of Fungi

8. DIVERSITY AMONG PLANTS
8.1 The Evolutionary Origin of Plants
8.2 Nonvascular Plants (General characteristics)
8.3 Seedless Vascular Plants (General characteristics)
  8.3.1 Evolution of Leaf
8.4 Seed Plants
  8.4.1 Evolution of Seed
  8.4.2 Gymnosperms (General characteristics)
  8.4.3 Angiosperms (General characteristics and Life cycle)

9. DIVERSITY AMONG ANIMALS
9.1 Characteristics of animals
9.2 Criteria for animal classification
9.3 Diversity in Animals
  9.3.1 Invertebrates
  9.3.2 Vertebrates

10. FORM AND FUNCTIONS IN PLANTS
10.1 Nutrition in Plants
10.2 Gaseous Exchange in Plants
10.3 Transport in Plants
  10.3.1 Uptake of Water by Roots and Pathways
  10.3.2 Ascent of Sap
  10.3.3 Opening and Closing of Stomata
  10.3.4 Translocation of Organic Matter
10.4 Homeostasis in Plants (Osmotic adjustments and Thermoregulation in Plants)
10.5 Support in Plants (Support in Herbaceous and Woody Plants)
10.6 Growth and Development in Plants
  10.6.1 Tissues for Growth – Apical and Lateral Meristems
  10.6.2 Primary and Secondary Growth
10.7 Growth Responses in Plants
  10.7.1 Plant Growth Regulators (PRGs)
  10.7.2 Geotropism and Phototropism
  10.7.3 Photoperiodism
  10.7.4 Vernalization

11. DIGESTION
11.1 Digestive System of Man
  11.1.1 Alimentary Canal; Structural and Functional details
  11.1.2 Role of Accessory Glands (Liver and Pancreas)
11.2 Disorders related to Digestive system and Food habits (Ulcer, Food Poisoning, Dyspepsia, Obesity, Anorexia Nervosa, Bulimia Nervosa)

12. CIRCULATION
12.1 Blood Circulatory System of Man
  12.1.1 Heart
    12.1.1.1 Structure of Heart
    12.1.1.2 Passage of Blood through Heart
    12.1.1.3 Heartbeat and its Control
    12.1.1.4 Electrocardiogram
  12.1.2 Blood Vessels (Arteries, Capillaries and Veins)
12.1.2.1 Vascular Pathway
12.1.2.2 Rate of Blood Flow in Blood Vessels
12.1.3 Blood Pressure and its Measurement

12.2 Cardiovascular Disorders
12.2.1 Thrombosis
12.2.2 Heart Problems
12.2.2.1 Causes and Diagnosis (Angiography)
12.2.2.2 Treatment (Coronary Bypass, Angioplasty, Open Heart Surgery) and Preventions
12.2.3 Hypertension (Causes, Related Diseases and Preventions)

12.3 Lymphatic System of Man

13. IMMUNITY
13.1 First Line of Defense (Skin, Digestive Tract, Air Passageway)
13.2 Second Line of Defense – The Nonspecific Defenses
13.2.1 Killing Cells of Blood
13.2.2 Protective Proteins
13.2.3 Inflammatory Response
13.2.4 Temperature Response
13.3 Third Line of Defense – The Specific Defenses
13.3.1 Inborn and Acquired immunity
13.3.2 Cell mediated and Antibody mediated immunity
13.3.3 Disorders of Immune system (Allergies, Autoimmune Diseases, Transplant Rejections)