RECRUITMENT OF ASSISTANT TEACHERS AND NON-TEACHING STAFF (GOVT.) - 2021

SECONDARY SECTION (CLASSES IX - X)

SUBJECT: LIFE SCIENCE

SYLLABUS

ZOOLEGY

Invertebrates:

1. Classification of major phyla upto subclasses with examples.

Chordates:

1. Classification of Amphibians, reptilians and mammalians upto order with examples.
2. Special features - Filter feeding in branchiostoma, Integumentory derivatives, Accessory respiratory organs, single and double circuit heart, aortic arches in vertebrates, origin and distribution of cranial nerves.

Cell Biology, Genetics & Molecular Biology:

1. Ultra structure and function of Plasma membrane, Mitochondria, Lissome & Ribosome.
2. Chromosome structure.
3. Cell cycle
4. Properties of DNA and RNA, DNA as genetic material
5. Mechanism of Replication, Transcription & Translation.
6. Cell division: Mitosis & Meiosis
7. Mendelism & neo-Mendelism
9. Mutation; Down syndrome & Kline fetter syndrome
10. Linkage and recombination
11. Sex determination in Drosophila and Man
12. Oncogane & Cancer

Developmental Biology:

1. Spermatogenesis & Oogenesis
2. Fertilization
3. Process of cleavage in frog and chick
4. Gastrulation in frog and chick
5. Placentation in mammals
6. Organizer concept.
Evolution, Adaptation & Distribution:
1. Chemical basis of origin of life.
2. Darwinism and synthetic theory of evolution.
5. Zoogeographical realms and their subdivisions with their characteristic fauna

Ecology & Wildlife:
1. Energy flow through ecosystem
3. Community ecology; Niche concept, Resource partitioning and species diversity.

Parasitology, Histology & Endocrinology:
1. Life History, pathogenicity and clinical features of Entamoeba histolytica Ascaris, Fasciola hepatica, Plasmodium vivax.
2. Immune response T & B lymphocytes, Antibody production in parasitic infection.
3. Histology of Pituitary, Thyroid and endocrine Pancreas and their hormonal functions in mammals.

Animal Physiology & Biochemistry:
1. Components of vertebrate blood, clotting & coagulation, ABO Blood group, Rh factor.
2. Physiology of nerve impulse & synaptic transmission.
3. Classification of Carbohydrates, Proteins and Lipids.
4. Enzymes: Classification, its properties and action
5. Vitamins - Chemical names, sources, deficiency, disorders for vitamins A, C and E

Economy Zoology:
1. Aquaculture: Induced breeding & Composite fish culture.
2. Sericulture: Silk varities in India, mulberry silkworm culture, diseases of silkworm and their control.
3. Pest: Biology & Control, of Paddy pest.
4. Animal husbandry: Common poultry breeds (Fowl), rearing methods, diseases & control.

BOTANY

A. GENERAL BOTANY

Introduction: Concept of living object; Definition, basic structural organization of plant.

Cell: (a) Minimum requirements of a "Cell to be cell”
(b) Prokaryotes and eukaryotes; Characteristics and differences with reference to the plant cell wall composition.
(c) Structure and functions of cellular organelles.
B. PLANT ANATOMY
Plant Tissue – Definition, Classification, Distribution and Functions; Occurrence and Classification of Meristematic and Permanent tissues; Simple and Complex tissues. Primary structures of root, stem and leaf in angiospermic plants.

C. ECOLOGY AND ENVIRONMENT
Divisions of ecology, ecological factors, plant succession, Adaptation of Hydrophytes, Xerophytes, Halophytes, General ideas about global warming and air pollution - a brief knowledge.

D. PLANT GROUPS
1. Salient features of Algae, Fungi, Bryophytes, Pteridophytes, Gymnosperms and Angiosperms.
2. ALGAE: Life cycle patterns with one example in each pattern. Economic importance (as food, fodder, agar, algin)
3. FUNGI: Structure of mycelium; nutrition; Asexual Spore forms; Economics importance (alcohol, Penicillin and edible mushroom)
4. BRYOPHYTES & PTERIDOPHYTES: Structural organization and function of archegonia and antheridia
5. GYMONSPERMS & ANGIOSPERMS: Structural organization of male and female gametophytes.

E. PLANT PATHOLOGY:
Necrosis, hypo plastic and hyper plastic symptoms of plant diseases. Disease control - a brief knowledge.

F. MORPHOLOGY:
Inflorescence; pollination - types and contrivances: Placentation - types and example; Development of embryo-sac; Fertilization and post-fertilization changes.

G. TAXNOMY:
Principles of artificial, natural and phylogenetic systems of classifications, Binomial nomenclature. Functions of Botanical Garden; Importance of Herbaria in Botanical Studies. Diagnostic characters and economic importance of the following families: Leguminosae (Fabaceae), Solanaceae. Rubiaceae and Gramineae (Poaceae).

H. PALEOBOTANY:
Fossils – Types with examples; Applications of Paleobotany.

I. PLANT PHYSIOLOGY:
(a) Absorption: Water & Sales uptake by living cell
(b) Transpiration: Its role in ascent of sap
(c) Nutrition: Role of mineral elements in plants.
(d) Photosynthesis: Phytosynthetic pigments, Hill reaction, Photophosphorylation, Calvin cycle.
(e) Respiration: Glycolysis, Krebs' cycle and ATP synthesis.
(f) Hormones: Definition, site of synthesis and role of auxin & ethylene. Role of synthetic hormones in agriculture

J. CYTOGENETICS & HEREDITY:
Nature of gene; Linkage and Crossing-over; Mendelian Principles, Darwinism & Neo-Darwinism.

K. MICROBIOLOGY:
Virus - general properties, structure of Bacteriophage and TMV; Electron microscopic structure of a bacterial cell. Role of bacteria in nitrogen cycle and maintenance of soil fertility. (N2 - fixation, nitrification, denitrification and ammonification).

PHYSIOLOGY

1. Units of Human Systems:
Structure function relationship of cell and its organelles and different tissues.

2. Biochemical and Biophysical Principles involved in Human systems:

   (b) Nutrition: Definition of balanced diet. ACU. Marasmus, Kwashiorkar, PCM, Dietary fibers, Vitamins: definition, classification, functions de symptoms and daily requirements, Hypervitaminosis. 
   Minerals ---- Dietary sources and nutritional importance. 
   BMR : Definition and factors affecting. R. Q.: Definition, factors affecting and significance, Biological value of protein. 
   SDA : Definition and importance.

4. Blood:
5. **Cardiovascular System:**
   (a) Heart – Properties of cardiac muscle, Origin and propagation of cardiac impulse, various events (atrial and ventricular) of cardiac cycle, heart sounds, heart rate, cardiac output and factors affecting its regulation.

6. **Respiratory System:**

7. **Renal Physiology:**

8. **Nerve-Muscle Physiology:**

9. **Nervous System and Sensory Physiology:**

10. **Skin and Regulation of Body Temperature:**

11. **Endocrine system:**
    Anatomy of endocrine system. Classification of Hormones. Basic concept of regulation of

Brief idea of the origin and functions of rennin-angiogenesis, prostaglandins, erythropoietin and melatonin. Elementary idea of gastrointestinal hormones.

12. Reproductive Physiology:

Primary and accessory sex organs and secondary sex characters.
Testis - Histology, spermatogenesis, testicular hormones and their functions.
Ovary - Histology, Oogenesis, ovarian hormones and their functions.
Oestrus and menstrual cycles and their hormonal control.
Development of mammary gland and lactation.