उ0प्र0 शिक्षा सेवा चयन आयोग, प्रयागराज।

Syllabus

Lecturer (PGT) - BIOLOGY
(Subject Code- 06)

Biology
Botany

Section:- (A)-

(1) Plant Diversity-

(a) Taxonomy of plants.

(b) Study of habit and habitats, Structure and reproduction of the followings-

(i) Algae

(ii) Bryophyta

(iii) Pteridophyta

(iv) Gymnosperm

(v) Angiosperm with the following families- Brassicaceae, Asteraceae Malvaceae, Liliaceae and Solanaceae.

(2) Angiosperms- Morphology and Morphological Modifications in root, stem, leaves etc. Histology, growth, reproduction and development.

(3) Plant Physiology-

(i) Water Relations-Transpiration, Translocation.

(ii) Photosynthesis.

(iii) Respiration and metabolism.

(iv) Plant Nutrition (Nutrients, Nitrogen fixation).

(v) Plant growth regulators (Phytohormones).

(vi) Flowering and Stress Physiology of plants.

(vii) Plant growth and movements.

(4) Microbiology –

(i) Viruses, Phytoplasma, Archaebacteria, Eubacteria.

(ii) Fungi (general characteristics, classification, growth, reproduction and life cycle).

(iii) Lichen

(iv) Economic importance of Micro-organisms.

(v) Biofertilizer

(5) Economic Botany-

(i) Medicinal and Aromatic Plants.

(ii) Food Plants.

(iii) Forage and Fodder Plants.

(iv) Fibre Crops.

(v) Fruit and Vegetable Plants.

(vi) Ethnobotany.

(vii) Ornamental Plants.

(viii) Oil Yielding Plants.

(ix) Timber Plants.

(x) Energy Plants.

(xi) Miscellaneous uses of Plants.

(6) Plant Pathology

(i) Causes, effects, control and cure of various Plant diseases.

(ii) Biological Control of Various Plant weeds, diseases and parasites.

(7) Ecology and Environment-

(i) Concept of Ecology and Environment

(ii) Various Habitat & Ecological Niche.

(iii) Ecosystem- Structure and function, Ecosystem stability, carrying capacity, Food-chain, Food -web, Energy flow, Ecological Pyramids, Biomes.

(iv) Population and biotic community.

(v) Bio-geo-Chemical Cycles.

(vi) Ecological Succession.

(vii) Natural Resources and their conservation.

(viii) Biodiversity and its conservation (*In-situ and Ex-situ*).

(ix) Environmental Pollution- Causes and its ill effects. Air, Water and Soil Pollution. Radioactive pollution, Noise Pollution, Ozone depletion, Acid rain, Eutrophication, Biological magnification, Ocean pollution, Ocean acidification, Control and prevention of various environmental Pollutions. Climate change, global warming and green – house effect, Environmental management. Renewable energy sources, Food security for increasing human population.

Zoology

Section:– (B) -

(1) Animal Diversity

(i) Animal Diversity

(ii) Animal Taxonomy with characteristic features.

(2) Non-Chordates

(i) Classification of Non-chordate phyla

(ii) Morphology. Anatomy, Nutrition, Respiration and reproduction of the following Non-chordates - *Amoeba, Sycon Hydra, Ascaris,* Cockroach, *Palaemon, Pila* and star-fish.

(iii) Parasitic protozoa

(iv) Parasitic adaptation in Helminthes and extra cellular vesicles

(v) Economic importance of insects.

(3) Chordates-

(i) Classification of chordates and various-classes of chordates with characters and examples.

(ii) Aquatic adaptation in fishes.

(iii) Origin and evolution of chordates.

(iv) Flying adaptations in birds.

(v) Phylogeny of prototheria, Metatheria and eutheria.

(4) Anatomy of- Frog, Uromastyx Pigeon and Rabbit.

(5) Animal Histology- Study of various tissues.

(6) Animal Physiology and Biochemistry-

(i) Nutrition and Digestion.

(ii) Respiration and metabolism.

(iii) Heart, Circulation of blood & Circulatory system.

(iv) Osmoregulation and Excretion.

(v) Movement and locomotion.

(vi) Nervous co-ordination and integration.

(vii) Sense organs.

(viii) Chemical co-ordination (Hormones and pheromone).

(ix) Vitamins and their role.

(x) Immune system.

(xi) Enzymes.

(7) Animal Embryology-

(i) Gametogenesis

(ii) Fertilization in lower and higher animal

(iii) Types of Eggs and cleavage.

(iv) Organogenesis.

(v) Development of Frog and Metamorphosis.

(vi) Extra Embryonic membranes in Birds.

(vii) Placenta in mammals. Regeneration.

(viii) Human reproductive System and reproductive physiology

(8) Cell Biology (Cytology and Molecular Biology)

(i) Prokaryotic and eukaryotic cells, their structure and properties.

(ii) Cell division (mitosis and meiosis) and Cell cycle.

(iii) Structure and functions of various cell organelles.

(iv) Chromosome structure and their behavior during cell division.

(v) Nucleic acids-Molecular structure of DNA and RNA.

DNA 'as genetic material

DNA replication and repair.

(vi) Genetic code, central dogma, protein synthesis and Gene expression.

(9) Advanced Genetics-

(i) Mendel's laws of inheritance.

(ii) Co-dominance, Incomplete dominance and Interaction of Genes.

(iii) Chromosomal theory of inheritance.

(iv) Linkage and crossing over.

(v) Sex-determination.

(vi) Multiple gene Inheritance and polyploidy.

(vii) Human genetic disorders.

(viii) Mutation

(10) Biotechnology-

(i) Concepts, principles and scope of Biotechnology.

(ii) Tools and techniques in Biotechnology.

(iii) Recombinant DNA technology and its applications in human welfare.

(iv) Tissue culture, somatic hybridization.

(v) Genetically modified Organisms, (GMO) Gene Bank and ethical concerns.

(11) Organic Evolution-

(i) concept and principles of evolution.

(ii) Origin of life.

(iii) Theories of evolution (Lamark, Darwin).

(iv) Evidences for evolution.

(v) Neo-Darwinism and synthetic theory of evolution.

(vi) Variations

(vii) Human evolution,