

UPPSC LT Assistant Teacher Written Exam Pattern / Syllabus

SYLLABUS SUBJECT - BIOLOGY

(A) ZOOLOGY

1. Principles of Taxonomy; concept of species and sub-species; Binomial nomenclature.
2. Classification and general characteristics of following Phyla: Protozoa, Porifera, Cnidaria, Ctenophora, Platyhelminthes, Aschelminthes, Annelida, Arthropoda, Mollusca, Echinodermata and Chordata
3. General organization and life history of representative of various Phyla: (i) **Protozoa**- Entamoeba, Euglena, Plasmodium and Paramecium (ii) **Porifera**- Leucosolenia and Sycon (iii) **Cnidaria**- Hydra, Aurelia and Obelia (iv) **Ctenophora**- Pleurobrachia (v) **Platyhelminthes**- Fasciola and Taenia (vi) **Aschelminthes**- Ascaris (vii) **Annelida**- Nereis, Pheretima and Hirudinaria (viii) **Arthropoda**- Cockroach, Musca, Mosquito and Prawn (ix) **Mollusca**- Unio and Pila (x) **Echinodermata**- Star fish (xi) **Chordata**- Herdmania, Amphioxus; Scoliodon, Rana, Uromastix, Columba, Rabbit.
4. Brief knowledge of (i) Protozoa and diseases (ii) Polymorphism in Cnidarians (iii) Helminthes and diseases (iv) Harmful and beneficial Insects (v) Poisonous and non-poisonous snakes (vi) Economic importance of mammals.
5. Prokaryotic and eukaryotic cells; Ultra-structure of animal cell; Function of cell organelles; Types of chromosomes; structure of genes and genetic code, Mitosis and meiosis.
6. Mendel's laws of inheritance, Linkage and crossing over, Eugenics; Organic evolution, Evidences of organic evolution, Theories of organic evolution, Lamarckism, Neo-Lamarckism, Darwinism, Neo-Darwinism, Processes of evolution, Mutation, Evolution through ages, Evolution of man
7. Ecology, Components of ecosystem and major Ecosystems; Environmental pollution.
8. Elementary knowledge of (i) digestion (ii) respiration (iii) blood and Circulation (iv) excretion (v) nerve conduction (vi) muscle contraction (vii) Endocrine glands and their function
9. Characteristics and classification of (i) carbohydrates, (ii) proteins, (iii) lipids, (iv) enzymes and (v) hormones
10. Gametogenesis; Types of eggs and cleavage, Embryonic development of Amphioxus, Frog and Chick, Placenta in mammals,
11. Biogeography, Zoogeographical realms and their characteristic fauna.

(B) Botany

- Viruses**- Definition, Nature, Transmission Structure of TMV, Bacteriophage, Viroids and Prions, Economic Importance of viruses.
- Bacteria**- Structure of Bacterial Cell, Nutrition, Reproduction and Economic Importance.
- Fungi** - General characters, structure, nutrition, reproduction and economic importance of fungi, Classification (Alexopoulos and Mims), characteristic features of different classes. Structure and life cycle of Rhizopus, Pythium, Albugo, Aspergillus, Agaricus, Puccinia, Ustilago and Alternaria.
- Algae**: General characters, Classification, characteristic features of different classes, Algal pigments, Economic Importance of algae. Structure and life cycle of Chlamydomonas, Volvox, Oedogonium, Vaucheria, Chara, Ectocarpus, Batrachospermum, Polysiphonia and Blue Green Algae (Nostoc and Anabaena),
- Lichens**- Nature, Types, Structure, Reproduction and Economic Importance
- Bryophytes**- General character, Classification, characteristic features of different classes, Reproduction and Economic Importance of bryophytes Structure and life cycle of Riccia, Marchantia, Anthoceros and Funaria.

Pteridophytes- General characters, Classification, characteristic features of different classes, stelar system and economic importance of pteridophytes. Structure and life cycle of Lycopodium, Selaginella, Equisetum and Marsilea. Heterospory and seed habit.

Gymnosperm- General Character and affinities, Life cycle, classification characteristic features of different classes, Distribution and Economic importance.

Structure and life cycle of Cycas, Pinus and Ephedra

Paleobotany – Fossils types, Fossilization, geological time scale and its importance.

Structure and Reproduction of Rhynia

Taxonomy Of Angiosperms - Binomial nomenclature, Bentham and Hookers System of Classification, Important Botanical Garden and Herbaria

Distinguishing features Of Ranunculaceae, Papaveraceae, Brassicaceae, Malvaceae, Fabaceae, Rosaceae, Cucurbitaceae, Apiaceae, Asteraceae, Rubiaceae, Apocynaceae, Solanaceae, Acanthaceae, Lamiaceae, Euphorbiaceae, Liliaceae and Poaceae.

Anatomy of Angiosperms- Tissue and tissue system, Anomalous secondary growth, anatomy of root, stem

Anatomy of Tinospora root, Dracaena stem, Bignonia stem, Boerhavia stem and Nyctanthes stem

Economic botany- Timber, fibers, oils, Medicinal, Beverages, Spices and condiments yielding Plants.

Embryology- Structure of anther, microsporogenesis and development of male gametophyte, Structure of ovule, megasporogenesis, Development and organization of embryo Sac, pollination, fertilization, development of Endosperm, Embryo development, Parthenocarp, Apomixis and polyembryony.

Cytology- Ultra Structure of plant cell with their typical cell organelles, Cell division and cell cycle.

Genetics- Chromosome structure, chromosome aberrations, Law of inheritance, Gene interaction, Linkage and crossing over, Mutation and Polyploidy.

Plant Physiology- Water absorption, ascent of sap, Transpiration, Mineral nutrition and deficiency, Photosynthesis, Respiration, Phytohormones, Vernalization, seed germination and dormancy, nitrogen cycle, Photoperiodism.

Biochemistry- Classification, properties and biological role of carbohydrates, proteins, lipids, nucleic acid and enzymes.

Environmental Botany- Environmental factors, soil conservation, Ecological adaptations in plants, ecological pyramids, food chain and food webs, Ecosystem, plant succession, pollution, plant communities and biodiversity, in Situ and ex situ conservation.

Plant Pathology- General symptoms of bacterial, fungal and viral disease. Different methods of plant disease control.

Symptoms, disease cycle and control measures of late blight of potato, early blight of potato, White rust of crucifers, black rust of wheat, loose smut of wheat, citrus canker, little leaf of brinjal, yellow vein mosaic of bhindi.

Biotechnology and genetic engineering- Importance in human welfare, vectors, recombinant DNA technology, transgenic plants, tissue culture, biopesticides and biofertilizers

Molecular Biology: Gene Concept, genetic code, Nucleic acids, replication of DNA, gene expression and Regulation.