



**SHANKAR
IAS ACADEMY™**

The Best IAS Academy In India SINCE 2004

IFS – MAINS – BOTANY TEST SCHEDULE – 2020-2021

TEST NO	DATE	SYLLABUS
Test 1	08.11.2020	<p>Microbiology and Plant Pathology: Viruses, bacteria, and plasmids-structure and reproduction. General account of infection, Phyto-immunology. Applications of microbiology in agriculture, industry, medicine and pollution control in air, soil and water.</p> <p>Important plant diseases caused by viruses, bacteria, mycoplasma, fungi and nematodes. Mode of infection and dissemination. Molecular basis of infection and disease resistance/ defense. Physiology of parasitism and control measures. Fungal toxins.</p>
Test 2	15.11.2020	<p>Cryptogams: Algae, Fungi, Bryophytes, Pteridophytes-structure and reproduction from evolutionary viewpoint. Distribution of Cryptogams in India and their economic potential.</p> <p>Phanerogams: Gymnosperms: Concept of Progymnosperms. Classification and distribution of Gymnosperms. Salient features of Cycadales, Coniferrals and Gnetales, their structures and reproduction. General account of Cycadofilicales, Bennettitales and Cordaitales.</p>
Test 3	22.11.2020	<p>Angiosperms: Systematics, anatomy, embryology, palynology and phylogeny. Comparative account of various systems of Angiosperm Classification. Study of angiospermic families-Magnoliaceae, Ranunculaceae, Brassicaceae (Cruciferae), Rosaceae, Leguminosae, Euphorbiaceae, Malvaceae, Dipterocarpaceae, Apiaceae (Umbelliferae), Asclepiadaceae, Verbenaceae, Solanaceae, Rubiaceae, Cucurbitaceae, Asteraceae (Composite), Poaceae (Gramineae), Arecaceae (Palmae), Liliaceae, Musaceae, Orchidaceae.</p>



		<p>Stomata and their types. Anomalous secondary growth, Anatomy of C 3 and C 4 plants. Development of male and female gametophytes, pollination, fertilization. Endosperm-its development and function. Patterns of embryo development. Polyembryony, apoxmix, Applications of palynology.</p> <p>Morphogenesis: Totipotency, polarity, symmetry and differentiation. Cell, tissue, organ and protoplast culture. Somatic hybrids and Cybrids.</p>
Test 4	29.11.2020	<p>Cell Biology: Techniques of Cell Biology. Prokaryotic and eukaryotic cells - structural and ultra structural details. Structure and function of extra cellular matrix or ECM (cell wall) and membranes cell adhesion, membrane transport and vesicular transport. Structure and function of cell organelles (chloroplasts, mitochondria, ER, ribosome's, embosoms, lissome, peroxisomes, hydrogenosome). Nucleus, nucleolus, nuclear pore complex. Chromatin and nucleosome. Cell signaling and cell receptors. Signal transduction (G-1 proteins, etc.). Mitosis and meiosis; molecular basis of cell cycle. Numerical and structural variations in chromosomes and their significance. Study of polygene, lamp brush and B-chromosomes-structure, behaviour and significance.</p> <p>Plant Utility and Exploitation: Origin of cultivated plants, Vavilov's centres of origin. Plants as sources for food, fodder, fibres, spices, beverages, drugs, narcotics, insecticides, timber, gums, resins and dyes. Latex, cellulose Starch and their products. Perfumery. Importance of Ethnobotany in Indian context. Energy plantation. Botanical Gardens and Herbaria.</p>
Test 5	24.01.2020	<p>Genetics, Molecular Biology and Evolution: Development of genetics, and gene versus allele concepts (Pseudo alleles). Quantitative genetics and multiple factors. Linkage and crossing over-methods of gene mapping including molecular maps (idea of mapping function). Sex chromosomes and sex linked inheritance,</p>



		<p>sex determination and molecular basis of sex differentiation. Mutation (biochemical and molecular basis). Cytoplasmic inheritance and cytoplasmic genes (including genetics of male sterility). Prions and prion hypothesis.</p> <p>Structure and synthesis of nucleic acids and proteins. Genetic code and regulation of gene expression. Multigene families.</p> <p>Organic evolution-evidences, mechanism and theories. Role of RNA in origin and evolution.</p>
Test 6	31.01.2020	<p>Plant Breeding, Biotechnology and Biostatistics: Methods of plant breeding-introduction, selection and hybridization (pedigree, backcross, mass selection, bulk method). Male sterility and heterosis breeding. Use of apomixes in plant breeding. Micro propagation and genetic engineering-methods of transfer of genes and transgenic crops; development and use of molecular markers in plant breeding.</p> <p>Standard deviation and coefficient of variation (CV). Tests of significance (Z-test, t-test and chi-square tests). Probability and distributions (normal, binomial and Poisson distributions). Correlation and regression.</p> <p>Ecology and Plant Geography: Ecological factors. Concepts and dynamics of community. Plant succession. Concepts of biosphere. Ecosystems and their conservation. Pollution and its control (including phytoremediation).</p> <p>Forest types of India -- afforestation, deforestation and social forestry. Endangered plants, endemism and Red Data</p> <p>Books. Bio-diversity. Convention of Biological Diversity, Sovereign Rights and Intellectual Property Rights. Biogeochemical cycles. Global warming.</p>
Test 7	07.02.2020	<p>Physiology and Biochemistry: Water relations, Mineral nutrition and ion transport, mineral deficiencies. Photosynthesis-photochemical reactions, photophosphorylation and carbon pathways including C pathway (photorespiration), C, C and CAM pathways. Respiration (anaerobic and aerobic, including fermentation-electron transport chain and oxidative phosphorylation. Chemiosmotic theory and ATP synthesis. Nitrogen fixation and</p>



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		nitrogen metabolism. Enzymes, coenzymes, energy transfer and energy conservation. Importance of secondary metabolites. Pigments as photoreceptors (plastidial pigments and phytochrome). Photoperiodism and flowering, vernalization, senescence. Growth substances-their chemical nature, role and applications in agri-horticulture, growth indices, growth movements. Stress physiology (heat, water, salinity, metal). Fruit and seed physiology. Dormancy, storage and germination of seed. Fruit ripening -- its molecular basis and manipulation.
Test 8	14.02.2020	Full Test Paper 1
Test 9	21.02.2020	Full Test Paper 2

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