BOTANY DAILY ANSWER WRITING PROGRAMME

Improve your Answer writing expression in matured manner over the Practice of more than 40 to 48 trial Test. Identify your mistakes & rectify solutions for those deviations in your preparation.

Test No	Syllabus / Subjects / Topics
	Plant Breeding, Biotechnology and Biostatistics:
1	Methods of plant breeding – introduction, selection and hybridization (pedigree, backcross, mass selection, bulk method).
2	Mutation, polyploidy, male sterility and heterosis breeding; Use of apomixes in plant breeding.
3	DNA sequencing; Genetic engineering – methods of transfer of genes; Transgenic crops and biosafety aspects;
4	Development and use of molecular markers in plant breeding; Tools and techniques - probe, southern blotting, DNA fingerprinting, PCR and FISH.
5	Standard deviation and coefficient of variation (CV); Tests of significance (Z-test, t-test and chi-square test); Probability and distributions (normal, binomial and Poisson); Correlation and regression.
	Ecology and Plant Geography:
6	Concept of ecosystem; Ecological factors; Concepts and dynamics of community; Plant succession; Concept of biosphere; Ecosystems; Conservation; Pollution and its control (including phytoremediation); Plant indicators; Environment (Protection) Act.
7	Forest types of India - Ecological and economic importance of forests, afforestation, deforestation and social forestry; Endangered plants, endemism, IUCN categories, Red Data Books; Biodiversity and its conservation; Protected Area Network; Convention on Biological Diversity;
8	Farmers' Rights and Intellectual Property Rights; Concept of Sustainable Development; Biogeochemical cycles; Global warming and climatic change; Invasive species; Environmental Impact Assessment; Phytogeographical regions of India.
	Morphogenesis:
9	Totipotency, polarity, symmetry and dfferentiation
10	Cell, tissue, organ and protoplast culture; Somatic hybrids and Cybrids; Micropropagation;
11	Somaclonal variation and its applications; Pollen haploids, embryo rescue methods and their applications.
	Microbiology and Plant Pathology:
12	Structure and reproduction/multiplication of viruses, viroids,
13	bacteria, fungi and mycoplasma;
14	Applications of microbiology in agriculture, industry, medicine and in control of soil and water pollution; Prion and Prion hypothesis. Important crop diseases caused by viruses, bacteria, mycoplasma, fungi and nematodes; Modes of infection and dissemination;
15	Molecular basis of infection and disease resistance/defence; Physiology of parasitism and control measures; Fungal toxins; Modelling and disease forecasting; Plant quarantine.

	Plant Resource Development:
16	Domestication and introduction of plants; Origin of cultivated plants; Vavilov's centres of origin;
17	Plants as sources for food, fodder, fibre, spices, beverages, edible oils, drugs, narcotics, insecticides, timber, gums, resins and dyes, latex, cellulose, starch and its products; Perfumery;
18	Importance of Ethnobotany in Indian context; Energy plantations; Botanical Gardens and Herbaria.
	Physiology and Biochemistry:
19	Water relations, mineral nutrition and ion transport, mineral deficiencies; Photosynthesis – photochemical reactions; photophosphorylation and carbon fixation pathways; C3, C4 and CAM pathways;
20	Mechanism of phloem transport; Respiration (anerobic and aerobic, including fermentation) – electron transport chain and oxidative phosphorylation; Photorespiration; Chemiosmotic theory and ATP synthesis; Lipid metabolism; Nitrogen fixation and nitrogen metabolism; Enzymes, coenzymes; Energy transfer and energy conservation; Importance of secondary metabolites;
21	Pigments as photoreceptors (plastidial pigments and phytochrome); Plant movements; Photoperiodism and flowering, vernalization, senescence; Growth substances – their chemical nature, role and applications in agri-horticulture; Growth indices, growth movements;
22	Stress physiology (heat, water, salinity, metal); Fruit and seed physiology; Dormancy, storage and germination of seed; Fruit ripening – its molecular basis and manipulation.
	Genetics, Molecular Biology and Evolution:
23	Development of genetics; Gene versus allele concepts (Pseudoalleles); Quantitative genetics and multiple factors; Incomplete dominance, polygenic inheritance, multiple alleles;
24	Linkage and crossing over; Methods of gene mapping, including molecular maps (idea of mapping function); Sex chromosomes and sex-linked inheritance, sex determination and molecular basis of sex differentiation;
25	Mutations (biochemical and molecular basis); Cytoplasmic inheritance and cytoplasmic genes (including genetics of male sterility).
26	Structure and synthesis of nucleic acids and proteins;Genetic code and regulation of gene expression; Gene silencing; Multigene families; Organic evolution – evidences, mechanism and theories. Role of RNA in origin and evolution.
	Cell Biology:
27	Techniques of cell biology; Prokaryotic and eukaryotic cells - structural and ultrastructural details; Structure and function of extracellular matrix (cell wall), membranes-cell adhesion, membrane transport and vesicular transport;
28	Structure and function of cell organelles (chloroplasts, mitochondria, ER, dictyosomes ribosomes, endosomes, lysosomes, peroxisomes); Cytoskelaton and microtubules; Nucleus, nucleolus, nuclear pore complex; Chromatin and nucleosome; Cell signalling and cell receptors; Signal transduction;
29	Mitosis and meiosis; Molecular basis of cell cycle; Numerical and structural variations in chromosomes and their significance; Chromatin organization and packaging of genome; Polytene chromosomes; B-chromosomes – structure, behaviour and significance.
	Cryptogams:
30	Algae, fungi, lichens, bryophytes, pteridophytes - structure and reproduction from evolutionary viewpoint;
31	Distribution of Cryptogams in India and their ecological and economic importance.

	Phanerogams:
32	Gymnosperms: Concept of Progymnosperms; Classification and distribution of gymnosperms; Salient features of Cycadales, Ginkgoales, Coniferales and Gnetales, their structure and reproduction; General account of Cycadofilicales, Bennettitales and Cordaitales; Geological time scale; Type of fossils and their study techniques.
	Angiosperms:
33	Systematics, anatomy, embryology, palynology and phylogeny. Taxonomic hierarchy; International Code of Botanical Nomenclature; Numerical taxonomy and chemotaxonomy; Evidence from anatomy, embryology and palynology.
34	Origin and evolution of angiosperms; Comparative account of various systems of classification of angiosperms; Study of angiospermic families – Mangnoliaceae, Ranunculaceae, Brassicaceae, Rosaceae, Fabaceae, Euphorbiaceae, Malvaceae, Dipterocarpaceae, Apiaceae, Asclepiadaceae,
35	Verbenaceae, Solanaceae, Rubiaceae, Cucurbitaceae, Asteraceae, Poaceae, Arecaceae, Liliaceae, Musaceae and Orchidaceae.
36	Stomata and their types; Glandular and non-glandular trichomes; Unusual secondary growth; Anatomy of C3 and C4 plants; Xylem and phloem differentiation; Wood anatomy.
37	Development of male and female gametophytes, pollination, fertilization; Endosperm - its development and function;
38	Patterns of embryo development; Polyembroyony and apomixes; Applications of palynology; Experimental embryology including pollen storage and test-tube fertilization.
39 to 48	Comprehensive Papers, 5 for each for papers

Features of Test Series:

- ✓ 38 Topic wise Test (Question cum answer spacing format exam)
- ✓ 10 Comprehensive Test
- ✓ Evaluation & Detailed feedback.
- ✓ One to one Interaction for every student for rectifying your mistakes in answer writing framework.

Note: The Dates of Examinations are Liable to Alteration, if the Circumstances so Warrant.

So I hope that this Mains Test Series Programme will help conceptually for your UPSC mains preparation. For more details please contact office.

With All The Best. Jai Hind!!!

KAVERI'S IAS