UNIVERSITY OF JAMMU

Notification

Syllabus of Entrance/Screening Test for the Post of Lecture Assistant (Botany)

S.No	Examination Type	Subject	No. of Question	Marks	Duration
1	Multiple Choice Questions	General English, General Knowledge, Logical Reasoning, Basic arithmetic, Analytical ability etc.	30	30	2hrs
2		Discipline Oriented	70	70	

1. General English, General Knowledge, Logical Reasoning, Basic Arithmetic, Analytical Ability Etc.
2. Discipline Oriented

Cell Biology

Plasma membrane – structure & functions.
Chloroplasts – structure, function & organization.
Mitochondria, Endoplasmic reticulum and golgi apparatus-structure & function

Molecular Biology

DNA and RNA – structure, types and functions, Replication, Transcription, Splicing and Translation.
Cell cycle and apoptosis-role of cyclins and CDKs.

Cytology, Genetics and Cytogenetics

Molecular organization of centromere and telomere.
Recombination – site specific and generalized, Holliday model. Somatic cell genetics.
DNA damage and repair; Transposons in pro – and eukaryotes.
Transfer of whole genome and individual chromosomes and chromosome segments.

Microbiology

General characteristics,ultrastructure, reporoduction and economic importance of Eubacteria, Archaebacteria, Phytoplasmas, Plant viruses and Fungi.

Biology of Lower Plants

Life cycle patterns among algae, bryophytes and pteridophytes, alternation of generations and its significance; economic importance of algae, bryophytes and pteridophytes.

Gymnosperms

General characters and diversity of gymnosperms; their distribution in India, economic importance of gymnosperms.

Taxonomy of Agniosperms

Concept of artificial, natural and phylogenetic system of classifications. Taxonomic hierarchies. Taxonomic tools. Basic Knowledge of ICBN. Endemism viz a viz hotspots with respect to Indian flora.

Plant Development

Seed – dormancy and seed germination; seeding development; organization of RAM and SAM secretory ducts and laticifers.

Plant Reproduction

Flower development – MADS box concept, Male sterility-phenomenon and implications, Self-incompatibility: types and genetics. Embryo and endosperm development. Apomixis; Fruit development and ripening. Seed structure and function.

Plant Physiology and Metabolism

Concept of water potential, passive and active solute transport, physiological effects and mechanism of action of growth regulators: concept & role of photoperiodism and vernalization.

Electron and proton transport, C_3 C_4 and CAM pathways in photosynthesis, photorespiration, structure and function of lipids, fatty acid synthesis, Biological nitrogen fixation, sulphate transport and assimilation.

Genetic Engineering

Gene cloning technique, restriction endonucleases, plasmids and phages as vectors. Gene transfer methods in plants,transgenic plants for herbicide tolerance and insect resistance; Artificial chromosomes (BAC and YAC), Aims, objectives and major achievements of Human Genome Project.

Plant Tissue Culture

Concept and application of somatic embryogenesis and synthetic seed production, disadvantages of long term cultures. Protoplast isolation, culture, fusion, hybrid selection and regeneration, genetic consequences of protoplast fusion, hybrids versus cybrids, applications of protoplast research. Applications and limitations of micropropagation. Origin, prospects and achievements of somaclonal variation.

Ecology

Nature and concept of biotic communities; life forms and biological spectrum; succession-mechanism & models; concept of ecosystems, energy flow; Biogeochemical cycles; Pollution – sources, types and control. Environmental impact assessment; sustainable development, ecological management.

Plant Resource Utilization

Origin of agriculture; centers of origin of crop plants; cereals and legumes as sources of food; medicinal plants of Jammu and Kashmir; Timber and forage plants; alcoholic beverages; green revolution; sustainable utilization of plant resources.

Plant Resource Conservation

Biodiversity- concept and concerns; concept of rare, threatened and endangered plants; priorities for conservation; in situ and ex situ conservation – methods and limitations; Activities and role of IUCN, WWF, ICAR and NBPGR in plant conservation.

REGISTRAR

No. Estab./C&R/NTW/24/3468
Dated: - 23-04-2024