

Notification

Syllabus of Entrance/Screening Test for the post of Laboratory Assistant in the Department of Zoology

S.No.	Examination Type	Units	No. of Questions	Marks	Duration
1.	Multiple Choice Questions	Chromatography Techniques	20	20	2 Hours
2.		Historical Background/Innate and adaptive immunity	20	20	
3.		Insects, General Organization and Classification	20	20	
4.		History of Development of Microbiology	20	20	
5.		Composition and levels of Biodiversity	20	20	

**UNIT I                      Composition and levels of Biodiversity**

(Genetic diversity, Species diversity, Ecosystem Diversity); Patterns of Biodiversity (a.b.y); Classification of Non-chordates and Chordates (major orders); Hot spots of biodiversity; National Parks; wildlife sanctuaries; wet lands; National wildlife Act, Red Data Book and its significance; Strategies for Biodiversity Conservation; In-situ, Ex – situ conservation; Biodiversity Act of India and related international conventions (CBD, Ramsar Convention, CITES, Brundtland Report, Agenda 21, Kyoto Protocol). Theories of organic evolution; Evolutionary time scale: Eras, period and epoch; Major events in evolutionary time scale and origin of unicellular and multi cellular organisms; Evidences of Biological evolution; Vestigial organs; Atavism; Connecting and missing links; Allopatricity; Sympatricity; Co-evolution; Reciprocal altruism; Hardy Weinberg law: Evolution of Man.

**UNIT II                      Insects, Preservation and Culture Practices**

General characters of different insect orders; Preparation of insect killing bottles; Techniques used for the collection of insects; Various methods used for preserving the terrestrial and aquatic insects; Sampling techniques for estimation of insect population and damage; Preparation of insects for the insect collection box; Study of different species of silkworms, characteristic features, moriculture, pests and diseases of silkworms, rearing and management of silkworms; Lac insect- natural enemies and their management; Identification of honey bee species, bee castes; identification and handling of bee-keeping equipments; Establishment and maintenance of apiaries.

**UNIT III                      Microscopy and techniques in Molecular Biology**

Thin layer chromatography, Affinity chromatography, Liquid and gas chromatography, Planar/ paper chromatography, Ion exchange chromatography, Size exclusion chromatography; Centrifugation: principles and types; Bright Field Microscopy, Dark Field Microscopy, Electron microscopy, Transmission Electron microscopy and Scanning Electron microscopy, Fluorescence Microscopy, Confocal Microscopy; Polymerase Chain Reaction; DNA sequencing Techniques, Southern Blotting;

*Passot's*

2/2

Western Blotting; Northern Blotting; Principle and applications of native polyacrylamide gel electrophoresis, SDS- polyacrylamide gel electrophoresis, 2D gel electrophoresis, Isoelectric focusing, Agarose gel electrophoresis; Radiolabelling techniques; Spectrophotometry-Principles and Techniques; DNA modifying enzymes and their applications: DNA polymerases; Terminal deoxynucleotidyl transferase, kinases and phosphatases, and DNA ligases.

#### **UNIT IV Immunology and Biochemistry: Background and Techniques**

Structure, Functions and Properties of Immune Cells – Stem cell, T cell, B cell, NK cell, Macrophage, Neutrophil, Eosinophil, Basophil, Mast cell, Dendritic cells; Immune Organs – Bone Marrow, Thymus, Lymph Node, Spleen, GALT, MALT, Antibody: Types, Structure, Function and generation of diversity; Immunological Techniques: ELISA; Immuno precipitation; Immuno blotting; Monoclonal antibodies; Principles of Precipitation, Agglutination, Immuno diffusion; Proteins: Structure, Function & Metabolism; Enzymes: Structure & Function; Irreversible inhibition, Reversible inhibition, Competitive inhibition; Non-competitive inhibition; Uncompetitive inhibition; Carbohydrates: Structure and Function; Lipids: classification; Nomenclature and forms of fatty acids: Saturated & Unsaturated fatty acids.

#### **UNIT V Microbiology and Biosafety practices**

Bacteriological techniques, Pure culture isolation: Streaking, serial dilution and plating methods: cultivation, maintenance and preservation/stocking of pure cultures; Physical methods of microbial control: heat, low temperature, high pressure, filtration, desiccation, osmotic pressure, radiation; Chemical methods of microbial control: disinfectants, types and mode of action; different techniques of streaking; Good laboratory practices: Introduction, WHO guidelines; Biosafety cabinets – Working of biosafety cabinets, using protective clothing, Discarding biohazardous waste – Methodology of Disinfection; Autoclaving & Incineration; Good lab practices, lab safety, waste disposal and managements; Biosafety in laboratory; Laboratory associated infections and other hazards, Simple staining; Negative staining; Gram's staining; Acid fast staining.

  
**REGISTRAR**

**Note:**

- I. Weightage of Entrance/Screening Test shall be as per the Selection Criteria notified vide No. Estab./C&R-NTW/22/1520-32 dated 01.09.2022 and uploaded on the University website [www.jammuuniversity.ac.in](http://www.jammuuniversity.ac.in)