

Cbse Class 11 Biology Practical Lab Manual

Cbse Class 11 Biology Practical Lab Manual CBSE Class 11 Biology Practical Lab Manual A Guide to Hands-on Learning This manual serves as a comprehensive guide for CBSE Class 11 students undertaking their Biology practical experiments. It aims to provide a structured approach to conducting experiments, analyzing results, and fostering a deeper understanding of biological concepts through practical application. This manual is organized into distinct sections, each covering a specific aspect of the practical syllabus.

1 Safety Precautions and Laboratory Etiquette

Importance of Safety: Emphasis on adhering to laboratory safety guidelines to ensure a secure environment for all.

Laboratory Rules: Clear guidelines on proper conduct, use of equipment, and waste disposal within the laboratory.

Personal Protective Equipment: Importance of wearing lab coats, goggles, gloves, and other protective gear when necessary.

Handling Chemicals and Biological Specimens: Detailed instructions on safe handling, storage, and disposal of chemicals, biological specimens, and glassware.

Emergency Procedures: Guidelines for handling accidents, fire, and other emergencies within the laboratory.

2 Essential Laboratory Techniques

Microscopy: Detailed explanation of different types of microscopes, their use, and techniques for preparing slides and observing specimens.

Dissection: Step-by-step instructions for dissecting various biological specimens, emphasizing careful observation and recording of anatomical features.

Staining Techniques: Exploration of different staining methods for enhancing visibility of cellular structures and components.

Quantitative Analysis: Introduction to basic statistical techniques for analyzing data, including mean, standard deviation, and graphical representations.

2.3 Practical Experiments

Experiment 1: Study of the External Morphology of a Cockroach This experiment involves detailed observation of a preserved cockroach, identifying its external features and understanding their functions.

Experiment 2: Study of the Structure of a Compound Microscope This experiment focuses on understanding the components of a compound microscope, their functions, and how to use the microscope effectively.

Experiment 3: Preparation of a Temporary Mount of a Leaf Peel to Observe Stomata This experiment demonstrates the process of preparing a temporary mount and observing stomata under the microscope.

Experiment 4: Study of the Pollen Grains This experiment involves observing pollen grains from different flowering plants, understanding their structure, and significance in pollination.

Experiment 5: Observation of Different Types of Plastids This

experiment explores the various types of plastids found in plant cells their functions and how to distinguish them under the microscope Experiment 6 Observation of Different Types of Bacteria This experiment introduces students to the diversity of bacteria focusing on morphology staining techniques and their role in various environments Experiment 7 Study of the Root Tip for Observing Different Stages of Mitosis This experiment showcases the process of cell division specifically mitosis through observation of a prepared root tip slide Experiment 8 Study of the Structure of a Flower This experiment involves dissecting a flower identifying its parts and understanding the role of each part in reproduction Experiment 9 Study of the Anatomy of the Human Heart This experiment examines the structure of a preserved human heart identifying its chambers valves and blood vessels 4 Viva Voce and Practical Examination Viva Voce This section provides a framework for preparing for oral examinations on the practical syllabus including key concepts experimental procedures and expected questions Practical Examination Guidance on the practical examination format evaluation criteria and tips for success 5 Appendices Glossary of Terms Definitions of key biological terms used throughout the manual Table of Reagents and Chemicals A comprehensive list of reagents and chemicals used in the experiments including their safety information and disposal procedures 3 Reference Materials A list of relevant textbooks journals and online resources for further study and exploration Conclusion This manual serves as a valuable resource for CBSE Class 11 students guiding them through the intricacies of Biology practical experiments It aims to enhance their understanding of theoretical concepts by applying them in a hands-on environment fostering scientific inquiry and preparing them for future scientific endeavors Note This manual is a framework and should be tailored to the specific requirements and resources available in individual schools The experiments mentioned here are merely examples and can be modified or supplemented with additional experiments to cater to specific learning objectives and curriculum

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considerable effort and time is allocated to introducing cell culture and
fermentation technology to undergraduate students in academia generally
through a range of courses in industrial biotechnology and related disciplines
similarly a large number of textbooks are available to describe the appli tions of
these technologies in industry however there has been a general lack of
appreciation of the significant developments in downstream processing and
isolation technology the need for which is largely driven by the stringent re latory
requirements for purity and quality of injectable biopharmaceuticals this is
particularly reflected by the general absence of coverage of this s ject in many
biotechnology and related courses in educational institutions for a considerable
while i have felt that there is increasing need for an introductory text to various
aspects of downstream processing particularly with respect to the needs of the
biopharmaceutical and biotechnology ind try although there are numerous texts
that cover various aspects of protein purification techniques in isolation there is a
need for a work that covers the broad range of isolation technology in an
industrial setting it is anticipated that downstream processing of proteins
methods and protocols will play a small part in filling this gap and thus prove a
useful contribution to the field it is also designed to encourage educational
strategists to broaden the coverage of these topics in industrial biotechnology
courses by including accounts of this important and rapidly developing element of
the industrial process

an excellent book in accordance with the latest syllabus for class 11 prescribed by cbse ncert and adopted by various state education boards

introduction

- 1 necessary equipments chemicals and other things for practical work
- 2 general instructions for practical work
- 3 special instructions for practical note book drawing and recording
- 4 special instructions for spotting experiments

- 1 to study and describe the flowering plant belonging to family one from each of the families
a solanaceae b fabaceae c liliaceae
- 2 to prepare temporary slide of transverse section of dicot monocot stem dicot monocot root
- 3 to study osmosis by potato osmometer
- 4 to study of plasmolysis in epidermal peel of tradescantial or rhoeo leaf
- 5 to study the distribution of stomata on the upper and lower surface of a leaf
- 6 to compare the rate of transpiration in upper and lower surface of the leaf
- 7 to test the presence of sugars glucose sucrose and starch proteins and fats and to detect their presence in suitable plant and animal materials
- 8 to study the separation of plant pigments by paper chromatography
- 9 to study the rate of respiration in flower buds leaf tissue and germinating seeds
- 10a to test presence of urea in urine
10b to test presence of sugar in urine
10c to detect presence of albumin in urine
10d to test urine for presence of bile salt

spotting

- 1 study of compound microscope
- 2 to study the plant specimen and identification with reasons
bacteria oscillatoria spirogyra rhizopus mushroom yeast liverwort moss fern pine one monocotyledonous plant one dicotyledonous plant and one lichen
- 3 study of animal specimens
1 amoeba
2 hydra
3 fasciola hepatica liver fluke
4 ascaris lumbricoides
5 hirudinaria granulosa
6 pheretima posthuma
7 palaemon
8 bombyx mori
9 apis indica honeybee
10 pila globasa snail
- 11 asterias starfish
12 scoliodon dogfish shark
13 labeo rohita rohu
14 rana tigrina frog
15 hemidactylus lizard
16 columba livia pigeon
17 oryctolagus cuniculus rabbit

- 4a to study the plant tissues palisade cells guard cells parenchyma collenchyma sclerenchyma xylem and phloem through prepared slide
- 4b to study the animal tissue squamous epithelium muscles fibres through prepared slide
- 4c to study mammalian blood smear by temporary permanent slide
- 5 study of mitosis in root tip of onion
- 6 study of different modification in root stem and leaves
- 7 to study and identify different types of inflorescence racemose and cymose
- 8 to study imbibition in seed raisins
- 9 to demonstrate that anaerobic respiration take place in the absence of air
- 10 to study human skeleton and joints
- 11 to study the external features of cockroach with help of model or chart

through the use of case studies and commentaries by senior scholars in the field this unique book provides student teachers with personal and professional insights into some key science education dilemmas

an accessible resource that can be used alongside the advanced biology text or any other core advanced biology text as it covers the practical element for as and

a level biology

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