



University of Mumbai's
NEP 2020 Based Curriculum

Vertical 04: Skill Enhancement Courses (SEC)

**Name of the Course: Tools and Techniques in Plant Science
(Practical)**

60 Hours

Credits: 02

Subject:	Botany
Class:	F. Y. B.Sc.
Semester:	I

Paper: Tools and Techniques in Plant Science (Practical)

Module Number: 02

Module's Name: Microscopy and staining Techniques

Self Assessments

Content Creator

Dr. Amanulla Khan

Department of Botany
Anjuman Islam Janjira,
Degree College of Science,
Murud-Janjira, Raigad Maharashtra-402401 India
E-mail ID: dramanullak@gmail.com



Scopus



Self-Assessment Terminal Questions**Module 2: Microscopy and Staining Techniques****2.1 Micro Slide Preparation—Whole Mounts, Smears, Squashes**

Multiple-Choice Questions (MCQs)

1. Which of the following is a common stain used in whole mount preparation?
 - a) Safranin
 - b) Methylene blue
 - c) Canada balsam
 - d) Aceto-carmine
2. What is the ideal medium for semi-permanent whole mounts?
 - a) Glycerin
 - b) Water
 - c) Ethanol
 - d) Formalin
3. The smear method is best suited for which of the following?
 - a) Algae
 - b) Plastids
 - c) Stem sections
 - d) Fungal spores
4. What is the purpose of fixing a smear slide by passing it over a flame?
 - a) Dehydration
 - b) Staining
 - c) Killing bacteria and fixing cells
 - d) Removing air bubbles
5. The squash method is primarily used to observe:
 - a) Blood cells
 - b) Chromosome structures during cell division

- c) Pollen grains
 - d) Bacterial cultures
6. In squash preparation, why is acetic acid used?
- a) To stain the sample
 - b) To hydrate the sample
 - c) To soften the tissue
 - d) To fix the cells
7. The radial longitudinal section (R.L.S.) helps in the observation of:
- a) Secondary growth in woody plants
 - b) Cell elongation
 - c) Vascular rays
 - d) Tissue differentiation in roots
8. What is the primary stain used in the Glycerine-Xylol method for whole mount preparation?
- a) Safranin
 - b) Haematoxylin
 - c) Crystal violet
 - d) Iodine
9. Which of the following is NOT a key application of the smear method?
- a) Analysis of bacterial cultures
 - b) Observation of plant cell division
 - c) Chromosome observation
 - d) Observation of animal cell mitosis
10. Which fixative solution is commonly used in squash preparation?
- a) FAA
 - b) Acetic alcohol
 - c) Formalin
 - d) Ethanol

Short Answer Questions

1. Describe the purpose of using glycerin in semi-permanent whole mount preparation.
 2. Explain the difference between a temporary and permanent whole mount slide preparation.
 3. How is a smear prepared using the edge of another slide?
 4. What are the primary advantages of the squash method in cytological studies?
 5. Outline the steps involved in preparing a smear of bacterial cultures.
-

Long Answer Questions

1. Discuss the applications and key differences between whole mounts, smears, and squashes in microscopic slide preparation.
 2. Explain the detailed procedure for preparing permanent whole mount slides using the Hygrobutol method.
 3. Compare the squash method with traditional sectioning techniques, focusing on the merits and limitations of each.
 4. Describe the process of staining in squash preparation and how it helps in visualizing different stages of mitosis.
 5. How does the smear technique aid in the detailed observation of cell organelles and what are its major uses in plant studies?
-

Viva-Based Questions

1. What are the challenges you may face while preparing a whole mount slide and how do you overcome them?
2. Why is it important to prevent air bubbles during cover slip placement in slide preparation?

3. In the smear method, how does the angle of the second slide affect the quality of the smear?
 4. How does the squash method contribute to our understanding of cell division, and why is it preferred for studying mitosis?
 5. What staining techniques can be used to differentiate between xylem and phloem tissues in whole mounts?
-

Correct Answers for MCQs:

1. a) Safranin
2. a) Glycerin
3. b) Plastids
4. c) Killing bacteria and fixing cells
5. b) Chromosome structures during cell division
6. c) To soften the tissue
7. a) Secondary growth in woody plants
8. b) Haematoxylin
9. d) Observation of animal cell mitosis
10. b) Acetic alcohol