



Student Name: _____	Class: _____
Student ID: _____	Date: _____

Assessment Overview

Duration: 90 minutes	Total Marks: 100
Topics Covered: <ul style="list-style-type: none">• Optical Principles and Light Behavior• Microscope Components and Functions• Image Formation and Magnification• Specimen Preparation and Handling• Digital Microscopy and Applications	

Instructions:

1. Read all questions carefully before attempting.
2. Show all calculations and working where required.
3. Diagrams should be clear and properly labeled.
4. Write your answers in the spaces provided.
5. Marks are indicated in brackets [] for each question.

Question 1

[2 marks]

Which of the following statements about convex lenses is correct?

A) They always produce virtual images

B) They are thinner at the center than at the edges

C) They can produce both real and virtual images

D) They only work with parallel light rays

Question 2

[2 marks]

The total magnification of a compound microscope is calculated by:

A) Adding objective and eyepiece magnifications

B) Multiplying objective and eyepiece magnifications

C) Dividing objective by eyepiece magnification

D) Squaring the objective magnification

Question 3

[10 marks]

A microscope has an objective lens with magnification $40\times$ and an eyepiece lens with magnification $10\times$.

a) Calculate the total magnification of the microscope. Show your working. [2 marks]

b) Draw and label a ray diagram showing how the image is formed through the microscope. [5 marks]

Draw your ray diagram here

c) Explain why it's important to start focusing with the lowest power objective lens. [3 marks]

Question 4

[15 marks]

You are preparing to observe onion cells under a microscope.

a) List the materials needed for preparing a wet mount slide. [3 marks]

b) Describe the step-by-step process of preparing the wet mount slide. [6 marks]

c) Explain two potential problems that might occur during preparation and how to avoid them. [6 marks]

Question 5

[20 marks]

Compare and contrast light microscopes and electron microscopes, considering the following aspects:

- Basic principles of operation
- Resolution capabilities
- Types of specimens that can be observed
- Advantages and limitations
- Common applications in science and industry

