

UNIT 1: CELL STRUCTURE

Part 1: The Microscope in Cell Studies

Name:

Easy multiple-choice questions

1 Which of the statements about light microscopes are correct?

1	The magnification of a light microscope is limited by the wavelength of light
2	The resolution of a light microscope is limited by the wavelength of light
3	To calculate the magnification of a light microscope the eyepiece lens and objective lens magnifications are added together

A. 1 and 2

B. 1 and 3

C. 2 and 3

D. 1, 2 and 3

(1 mark)

2 Which row correctly describes the magnification and resolution of an electron microscope in relation to a light microscope?

	magnification	resolution
A	lower	higher
B	higher	lower
C	higher	higher
D	lower	lower

(1 mark)

3 At approximately which magnification would the resolution of a light microscope become too low to produce a clear image?

- A. $\times 100$
- B. $\times 200$
- C. $\times 400$
- D. $\times 1500$

(1 mark)

4 Which of the following is **not** a step involved in the preparation of an onion cell specimen for viewing under a light microscope?

- A. Place one edge of a coverslip on the slide and carefully lower the rest of the coverslip onto the specimen
- B. Add a drop of iodine stain
- C. Remove a layer of onion tissue that is one cell thick from a piece of onion
- D. Add a drop of methylene blue stain

(1 mark)

5 Specimens can be measured using eyepiece graticules and stage micrometers.

Which of the following correctly describes the role of a stage micrometer?

- A. Directly measuring the size of a specimen
- B. Determining the size of the eyepiece graticule units
- C. Determining the magnification at which an object is being viewed
- D. A type of slide upon which a specimen can be prepared

(1 mark)

6 A microscope has a resolution of 200 nm.

Which of the following organelles would not be resolved by this microscope?

- A. Mitochondria
- B. Lysosomes
- C. Ribosomes
- D. Chloroplasts

(1 mark)

7 Which of the following is **not** a convention that should be used when producing biological drawings of cells?

- A. Single, clear pencil lines should be used
- B. Shading should be used to indicate light and dark regions of cells
- C. Label lines should not have arrow heads
- D. At least half of the available space on the page should be taken up by the drawing

(1 mark)

8 Which of the options gives the resolution, in nanometres, of an electron microscope and a light microscope?

	electron microscope	light microscope
A	5.0	20
B	5.0	200
C	0.5	20
D	0.5	200

(1 mark)

9 A lysosome has a diameter of $0.4\text{ }\mu\text{m}$.

Which of the following gives the lysosome diameter in nm?

- A. 4
- B. 40
- C. 400
- D. 4000

(1 mark)

10 Which of the following correctly defines the term **resolution** in light microscopy?

- A. The size of the smallest object that can be seen
- B. Twice the wavelength of the light used to illuminate the specimen
- C. The shortest distance at which two objects can be seen as separate points
- D. The product of the magnifications of the eyepiece and the objective lens

(1 mark)