

1.1 The Microscope in Cell Studies

Question Paper

Course	CIEA Level Biology
Section	1. Cell Structure
Topic	1.1 The Microscope in Cell Studies
Difficulty	Easy

Time allowed: 20
Score: /10
Percentage: /100

Question 1

The statements below are about light microscopes.

- 1 As the magnification increases the resolution decreases.
- 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.
- 4 The scale on a stage micrometer is resolved more clearly than an eyepiece graticule.

Which statements are correct?

- A. 1 and 2
- B. 1 and 4
- C. 2 and 3
- D. 3 and 4

[1 mark]

Question 2

Which row compares correctly the magnification and resolution of an electron microscope with a light microscope?

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

[1 mark]

Question 3

Approximately at which magnification would a light microscope not be suitable because the resolution becomes too low?

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

[1 mark]

Question 4

Compared to a light microscope the electron microscope has a higher resolution.

Which of the following is a result of a higher resolution?

- A. The ability to see mRNA in all cells.
- B. The ability to see the nucleus in eukaryotes.
- C. The ability to produce larger images of cells.
- D. The ability to see cristae in mitochondria.

[1 mark]

Question 5

Cells can be measured using eyepiece graticules and stage micrometers.

Which of the following correctly describes why a stage micrometer is calibrated?

- A. The eyepiece graticule is magnified by the objective lens.
- B. An eyepiece graticule can be used to make measurements.
- C. An eyepiece graticule magnifies the specimen.
- D. An eyepiece graticule makes comparisons.

[1 mark]

Question 6

The list of organelles below are viewed by a microscope with resolution of 200 nm.

Which organelles would not be resolved by this microscope?

- A. mitochondria
- B. lysosomes
- C. ribosomes
- D. chloroplasts

[1 mark]

Question 7

Which of the following would restrict the resolution of the light microscope?

- A. The low magnification produced by glass.
- B. The wavelengths of visible light.
- C. The low light intensity of microscope lamps.
- D. The inability to cut very thin sections.

[1 mark]

Question 8

Which of the options correctly describe the resolution, in nanometres, of an electron microscope and of 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]

Question 9

A lysosome has a diameter of 0.4 μm . What is the diameter in nm?

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

[1 mark]

Question 10

What is meant by 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 between two objects that can be seen as separate.
- D. The product of the magnifications of the eyepiece and the objective lens.

[1 mark]