

**AQA, OCR, Edexcel**

**A Level**

# **A Level Biology**

**Microscopy and Studying Cells  
Questions**

Name:

**M M E**

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**Total Marks: /22**

## Studying Cells

Microscopy is the study of objects that are too small to be seen by the naked eye using a microscope.

1. The first microscope was the light microscope, which was invented in the 1600s and could achieve up to 300 times magnification. Some of the first cells discovered by the light microscope were red blood cells and sperm cells. Electron microscopes were developed in the 1900s.

- a. i) How do electron microscopes differ from light microscopes in terms of how they work and what they can view? (3 marks)
- ii) What are the two different types of electron microscopes? (2 marks)
- iii) Fill in the table below, identifying 2 advantages and one disadvantage of the two microscopes mentioned in 1. a) ii) (6 marks)

| Type of microscope |  |
|--------------------|--|
| Advantages         |  |
|                    |  |
| Disadvantage       |  |

- b) i) What is the difference between magnification and resolution? (2 marks)
- ii) A Cabbage Root Fly Shown below is 0.06mm long. Using the image calculate the magnification. (2 marks)



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2. In order for organelles to be analysed properly they need to be separated from the rest of the cell.

a) First the cells are broken up through homogenisation. This must be performed under cold, isotonic buffer conditions.

i) Why are these conditions necessary for effective homogenisation? (4 marks)

b) A suspension is then formed and centrifugation can then take place. This involves spinning the suspension to separate the organelles. The heaviest organelles are separated first.

i) What variable must be altered to separate the less dense organelles from the suspension? (1 mark)

ii) Using the drawings of the ribosome and two other organelles below, identify them and write them in the order they would form in the pellet during centrifugation . (3 marks)

