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Biology
Standard level
Paper 1B

11 May 2026

Zone A afternoon | **Zone B** afternoon | **Zone C** afternoon

Session number

1 hour 30 minutes [Paper 1A and Paper 1B]

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Instructions to students

- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Answer all questions.
- Answers must be written within the answer boxes provided.
- A calculator is required for this paper.
- The maximum mark for paper 1B is **[25 marks]**.
- The maximum mark for paper 1A and paper 1B is **[55 marks]**.



Answer **all** questions. Answers must be written within the answer boxes provided.

1. (a) Distinguish between the composition of a plant cell wall and a fungal cell wall. [1]

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A student prepared a temporary mount of cells from an onion (*Allium cepa*) and viewed the cells using a light microscope.

- (b) Outline the steps in the preparation of a temporary mount of cells from an onion. [3]

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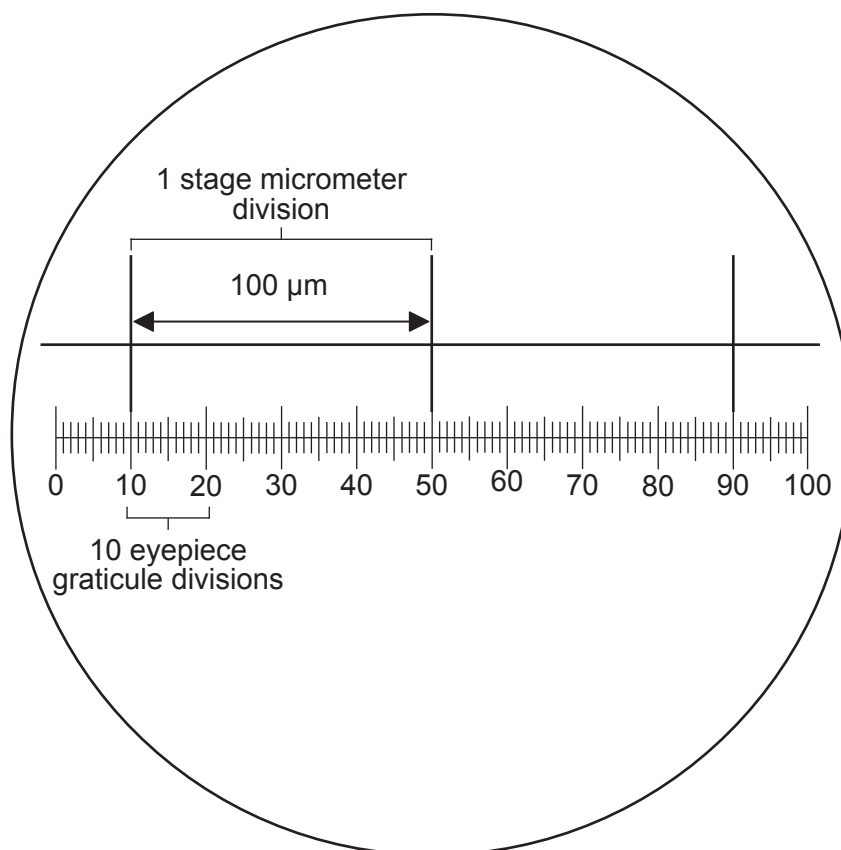
(This question continues on the following page)



(Question 1 continued)

The student was asked to calculate the actual length of an onion cell.

To do this, she first calibrated an eyepiece graticule using a stage micrometer, as shown in the diagram.



- (c) When viewed under the microscope, the onion cell measured 72 eyepiece graticule divisions.

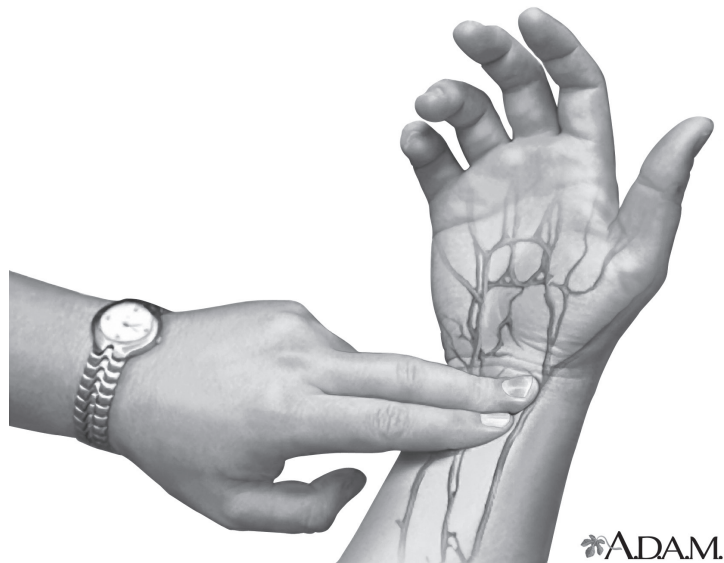
Calculate the actual length, in μm , of this onion cell.

[1]

..... μm



2. (a) Two students measured their heart rate by placing fingertips on the radial artery in the wrist to feel a pulse, as shown.



Student A counted the number of pulses in 1 minute.

Student B counted the number of pulses in 15 seconds and multiplied the result by 4.

- (i) Suggest **one** reason why student A's method would be more accurate. [1]

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- (ii) Suggest **one** advantage of using a digital heart rate monitor to measure heart rate, rather than feeling the radial artery. [1]

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(This question continues on the following page)



(Question 2 continued)

(b) Outline the possible consequences of a blood clot in a coronary artery.

[3]

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Total blood cholesterol level and obesity are two risk factors for coronary heart disease. Two indicators of obesity are body mass index (BMI) and waist-to-hip ratio (WHR).

Scientists determined the BMI, WHR and total blood cholesterol level of a large group of volunteers. They then used a statistical test to determine the correlation coefficient (r) and probability (p) values between:

- BMI and total blood cholesterol level
- WHR and total blood cholesterol level

Their results are shown in the table.

Indicator of obesity	Correlation coefficient (r) with total blood cholesterol level	Probability (p) value
BMI	0.31	<0.05
WHR	0.51	<0.05

(c) Deduce the conclusions that can be drawn from the data in the table.

[3]

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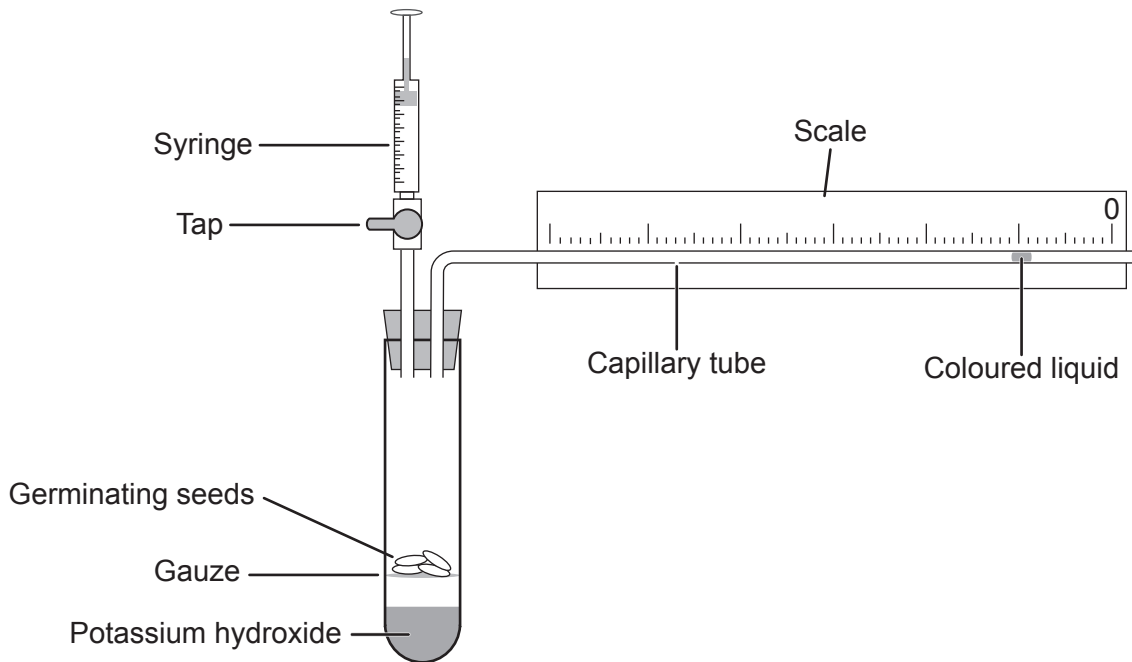
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3. Students investigated the effect of temperature on the rate of respiration of germinating seeds using a respirometer, as shown.



- (a) The potassium hydroxide in the tube absorbs any carbon dioxide produced by the germinating seeds.

Explain the reason that the coloured liquid moves to the left when the germinating seeds respire.

[2]

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- (b) The students also set up a control experiment for comparison. In this, they replaced the germinating seeds with the same mass of plastic beads.

Outline the purpose of this control experiment.

[1]

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(This question continues on the following page)



(Question 3 continued)

- (c) Distinguish between the processes of aerobic respiration and anaerobic respiration in **humans**.

[3]

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- (i) amplify the number of DNA fragments;

[1]

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- [1]

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[illegible]

- (b) Deduce, with a reason, which male, A, B or C, is most likely to be the father of this child.

[2]

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(Question 4 continued)

- (c) Explain the reasons for using many different markers to produce a DNA profile in forensic investigations.

[2]

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References:

- 2.(a)** @A.D.A.M. Inc. 2026. www.adamimages.com.
- 2.(c)** Mallick, A.K., Ahsan, M., Das, B. and Rai, S., 2018. A correlation study of lipid profile with body mass index and waist hip ratio in Rohilkhand region. [e-journal] *Int J Med Res Rev* 6(03), pp. 186–191. <https://doi.org/10.17511/ijmrr.2018.i03.09>. Source adapted.

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12EP10

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12EP11

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12EP12