Cambridge IGCSE

**Cambridge Assessment International Education**
Cambridge International General Certificate of Secondary Education

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|---|---|
| CANDIDATE NAME | |
| CENTRE NUMBER | |
| CANDIDATE NUMBER | |

*3480858917*

**BIOLOGY** **0610/53**

Paper 5 Practical Test **May/June 2019**

**1 hour 15 minutes**

Candidates answer on the Question Paper.

Additional Materials: As listed in the Confidential Instructions.

**READ THESE INSTRUCTIONS FIRST**

Write your centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.

Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

| For Examiner's Use | |
|---|---|
| 1 | |
| 2 | |
| Total | |

This syllabus is regulated for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **10** printed pages and **2** blank pages.

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**[Turn over**

**1** Fig. 1.1 shows a section through an unfertilised chicken's egg.

The egg is made up of the outer shell, inner yellow yolk and albumen (egg white).

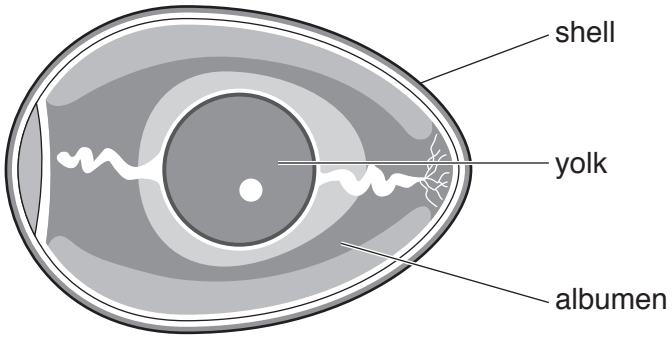



**Fig. 1.1**

The albumen and yolk are composed of different substances, including fats.

**(a)** Describe how ethanol can be used to test a sample of food for the presence of fat.

Include the result for a positive test.

.....

.....

.....

.....

.....

..... [3]

You should use the safety equipment provided while you are carrying out the practical work.

**(b)** You are provided with a sample of albumen suspension in a beaker, labelled **A**.

You are going to test the albumen suspension for the presence of protein.

- Use a syringe to put 2 $cm^3$ of albumen suspension **A** into a test-tube.
- Add 2 $cm^3$ of biuret solution from the beaker labelled **biuret**.
- Mix thoroughly by gently shaking the test-tube.

Describe your observations and state your conclusion.

observations .....

.....

conclusion .....

.....

[2]

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**(c)** Proteins can be broken down by enzymes.

You will investigate the effect of acid on the breakdown of albumen by a protease enzyme.

**Read all the instructions but do not carry them out until you have drawn a table for your results in the space provided in 1(c)(i).**

Step 1 Label three test-tubes **P**, **Q** and **R** and place them into the test-tube rack.

Step 2 Use a syringe to add the substances, in the volumes shown in Table 1.1, to test-tubes **P**, **Q** and **R**.

Step 3 Raise your hand when you are ready for warm water to be added to your **water-bath**. Place test-tubes **P**, **Q** and **R** into the **water-bath**.

**Table 1.1**

| test-tube | albumen suspension **A** /$cm^3$ | distilled water **W** /$cm^3$ | acid **H** /$cm^3$ | enzyme **E** /$cm^3$ |
|---|---|---|---|---|
| **P** | 2 | 2 | 0 | 0 |
| **Q** | 2 | 1 | 0 | 1 |
| **R** | 2 | 0 | 1 | 1 |

Step 4 Gently shake the test-tubes to mix the contents and then leave them in the **water-bath** for 10 minutes. Continue with the questions while you wait.

Step 5 After 10 minutes remove test-tubes **P**, **Q** and **R** from the **water-bath** and place them in the test-tube rack. Add 2 $cm^3$ of biuret solution to each test-tube and mix well.

Step 6 Observe the appearance of the solution in each test-tube.

Record your observations in your table in **1(c)(i)**.

**(i)** Prepare a table to record your observations.

[3]

**(ii)** Identify the variable that was changed (independent variable) in this investigation.

..... [1]

**(iii)** State the purpose of test-tube **P** in this investigation.

.....

..... [1]

**(iv)** Suggest why 1 $cm^3$ of distilled water was added to test-tube **Q**.

.....

..... [1]

**(v)** Identify **one** potential error in step **2**.

Explain how this error could affect the results.

error .....

.....

effect of the error .....

.....

.....

[2]

**(vi)** Identify **one** potential safety hazard in this investigation.

.....

..... [1]

[Total: 14]

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**2** **(a)** Fig. 2.1 is a photomicrograph showing a cross-section of an artery.

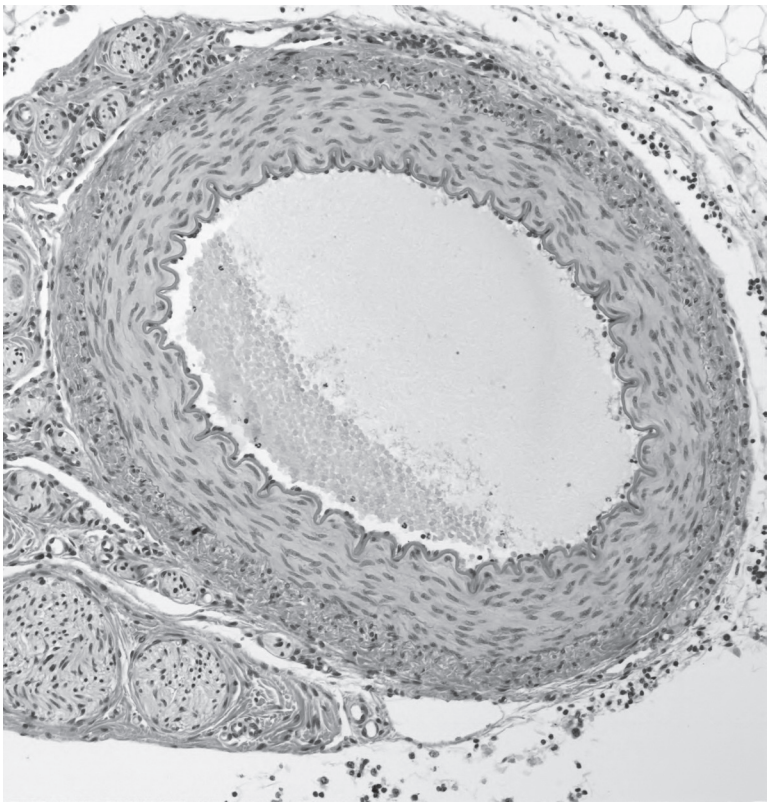


**Fig. 2.1**

Make a large drawing of the artery in Fig. 2.1 to show the layers that make up the artery wall.

Do not draw individual cells.

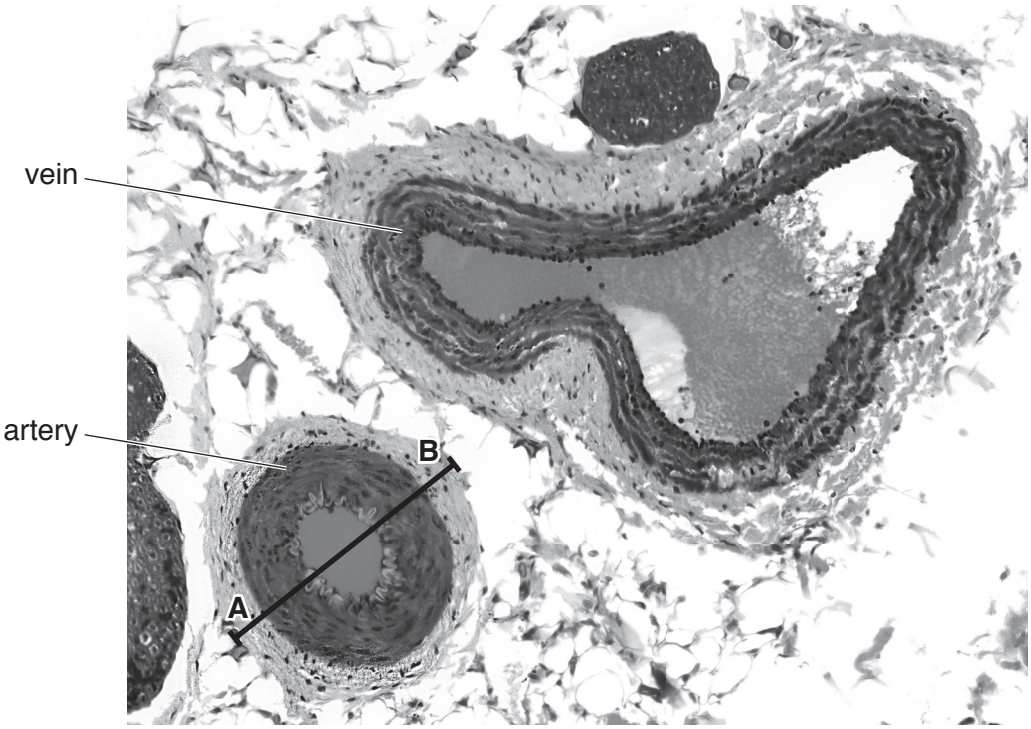
[4]

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**[Turn over**

**(b)** Fig. 2.2 shows a photomicrograph of cross-sections of an artery and a vein.




magnification ×13

**Fig. 2.2**

**(i)** The diameter of the artery is indicated by line **AB**.

Measure the length of line **AB**, on Fig. 2.2. Include the unit.

length of line **AB** .....

Calculate the actual diameter of the artery using your measurement and the formula.

$$\text{magnification} = \frac{\text{length of line } \mathbf{AB}}{\text{actual diameter of the artery}}$$

Give your answer to two significant figures. Include the unit.

Show your working.

.....
[3]

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**(ii)** Describe **one** similarity and **one** difference between the artery and the vein shown in Fig. 2.2.

similarity .....

.....

difference .....

.....

[2]

**(c)** A student investigated the change in their pulse rate before and after exercise.

The student measured their pulse before exercise, during exercise and after exercise.

The results are shown in Table 2.1.

**Table 2.1**

| activity | time /minutes | pulse rate /beats per minute |
|---|---|---|
| before exercise | 2 | 78 |
| | 4 | 78 |
| | 6 | 78 |
| during exercise | 8 | 125 |
| | 10 | 148 |
| | 12 | 160 |
| after exercise | 14 | 154 |
| | 16 | 122 |
| | 18 | 94 |

**(i)** Calculate the percentage increase in the pulse rate from minute 6 (before exercise) to minute 12 (during exercise).

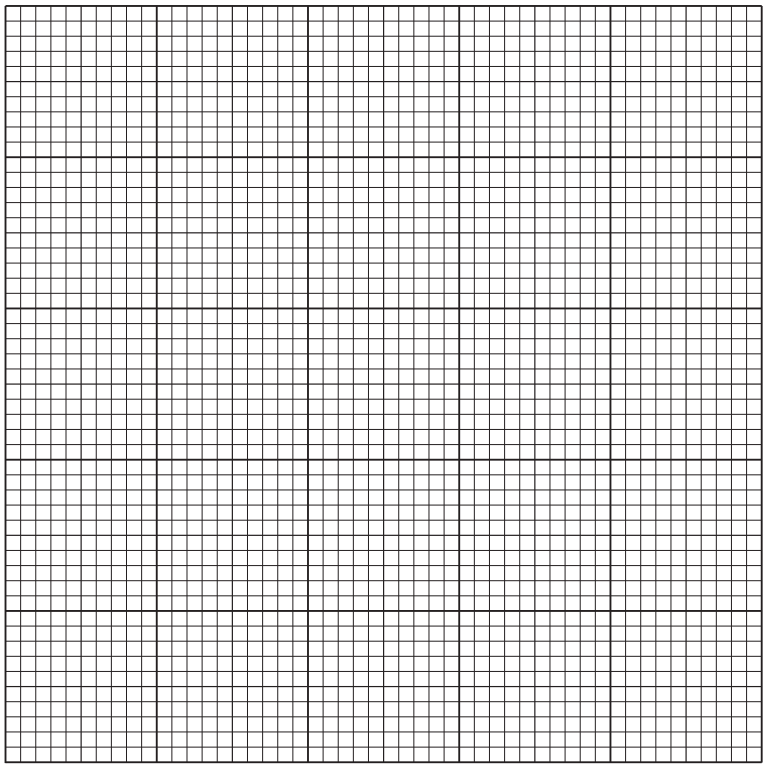
Give your answer to the nearest whole number.

Show your working.

..... %
[2]

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**(ii)** Plot a line graph on the grid of time against pulse rate for the results shown in Table 2.1.



[4]

**(iii)** Use your graph to estimate the pulse rate of the student at 15 minutes.

Show on your graph how you obtained your answer.

..... bpm
[2]

**(iv)** Describe the results of the student's investigation.

.....

.....

.....

.....

.....

..... [3]

**(d)** Plan an investigation to find out how running at different speeds affects pulse rate.

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..... [6]

[Total: 26]

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