Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER					

BIOLOGY **0610/63**

Paper 6 Alternative to Practical **May/June 2019**

1 hour

Candidates answer on the Question Paper.

No Additional Materials are required.

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.

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 **11** printed pages and **1** blank page.

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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).

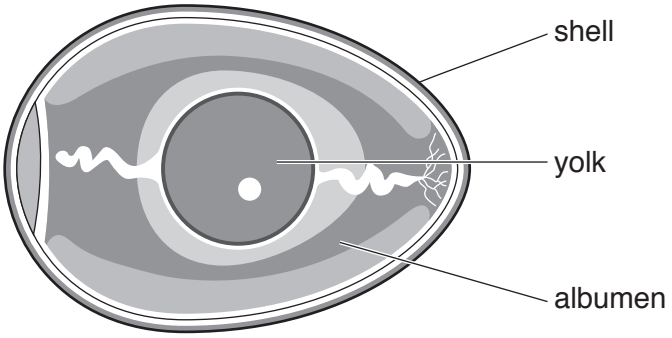

Fig. 1.1

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]

(b) A student was given a sample of albumen. They tested the sample for reducing sugars by carrying out the steps shown:

- a syringe was used to put 2 cm^3 of albumen suspension into a test-tube
- 2 cm^3 of Benedict's reagent was added
- the solutions were mixed thoroughly by gently shaking the test-tube.

(i) State the next step required to complete the test for reducing sugars.

.....

.....

..... [1]

(ii) Describe a positive result for the presence of reducing sugars.

.....

..... [1]

(c) Proteins can be broken down by protease enzymes. Enzymes are also made of protein.

A student investigated the effect of acid on the breakdown of albumen by a protease enzyme.

Step 1 Three test-tubes **P**, **Q** and **R** were prepared.

The volumes of the substances added to the test-tubes are shown in Table 1.1.

Table 1.1

test-tube	albumen / cm^3	distilled water / cm^3	acid / cm^3	enzyme / cm^3
P	2	2	0	0
Q	2	1	0	1
R	2	0	1	1

Step 2 The test-tubes were placed in a water-bath at 40 °C for 10 minutes.

Step 3 After 10 minutes the test-tubes were removed from the water-bath and placed in a test-tube rack. 2 cm^3 of biuret solution was added to each test-tube.

Step 4 The appearance of the solution in each test-tube was observed.

The student's observations are shown in Fig. 1.2.

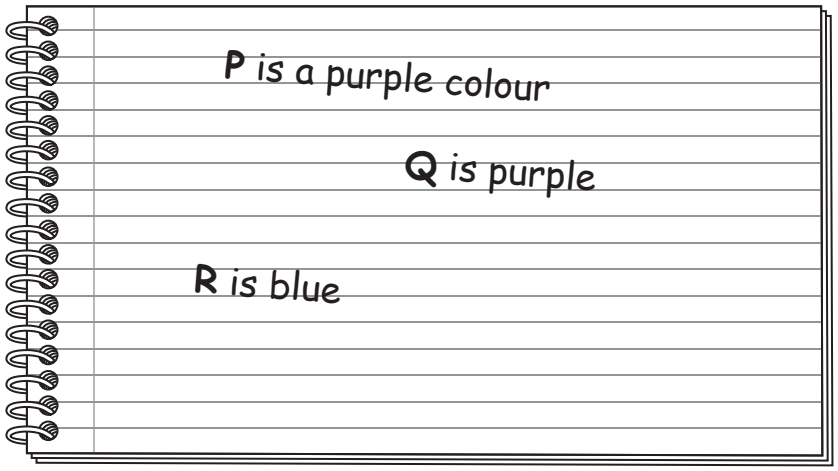

Fig. 1.2

(i) Prepare a table to record the observations shown in Fig. 1.2.

[2]

(ii) State a conclusion for these results.

.....

.....

..... [1]

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

..... [1]

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

.....

..... [1]

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

.....

..... [1]

(vi) The student used only one syringe to prepare the solutions in test-tubes **P**, **Q** and **R** in step **1**.

Explain why this is a potential source of error and how it could affect the results.

error .....

.....

effect of the error .....

.....

.....
[2]

(vii) 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.

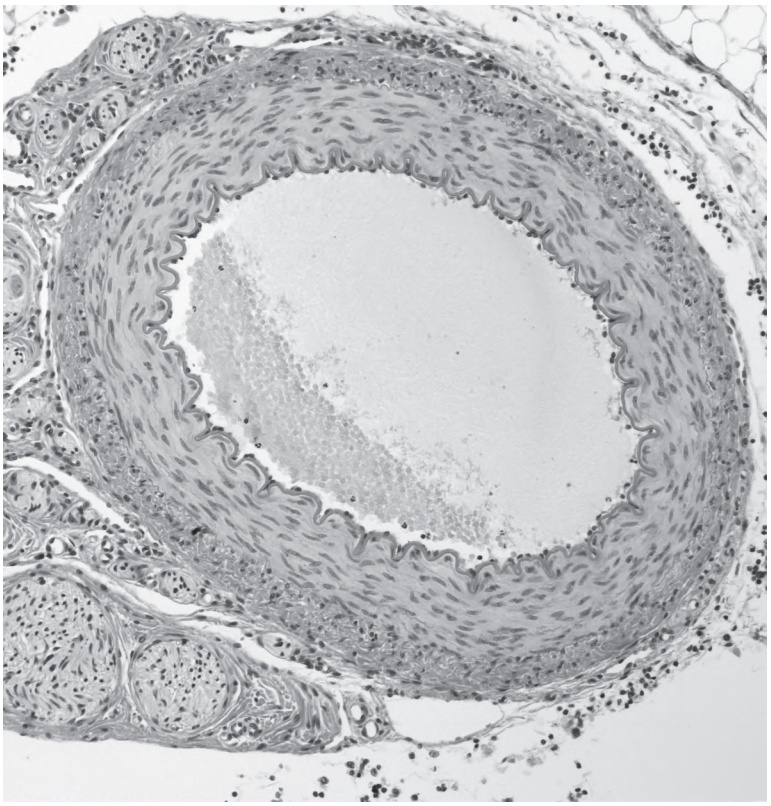


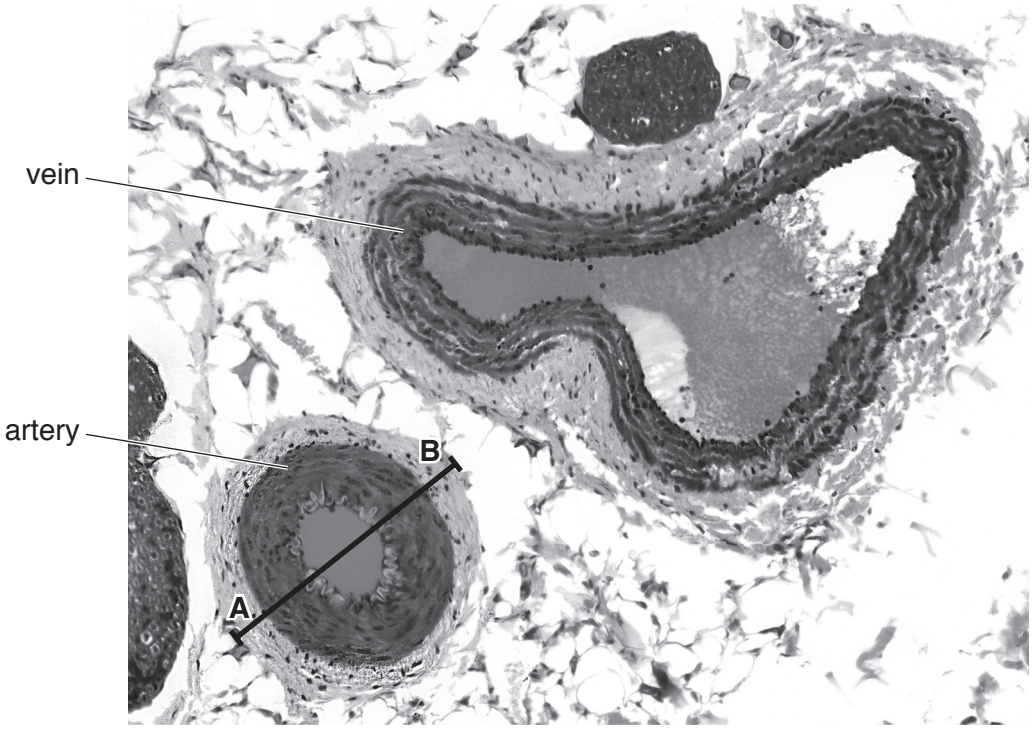
Fig. 2.1

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]

(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]

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

similarity .....

.....

difference .....

.....
[2]

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

The person measured their pulse before exercise, during 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

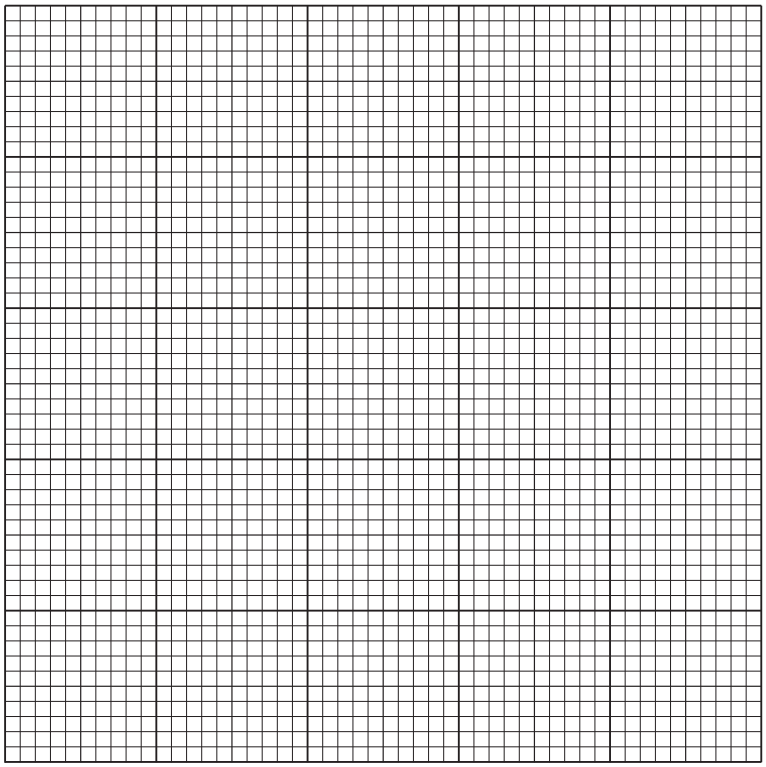
(i) Calculate the percentage increase in the pulse rate from minute 6 (before exercise) to minute 12 (during exercise).

Give your answer to the nearest whole number.

Show your working.

..... %
[2]

(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 person at 15 minutes.

Show on your graph how you obtained your answer.

..... bpm
[2]

(iv) Describe the results of the person's investigation.

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..... [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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