Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

6816493985

BIOLOGY **0610/52**

Paper 5 Practical Test **October/November 2016**

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	

The syllabus is approved 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

Read through all the questions on this paper carefully before starting work.

1 Maize (corn) is an important food crop that produces grain. Fig. 1.1 shows a maize grain that has germinated to form a seedling.

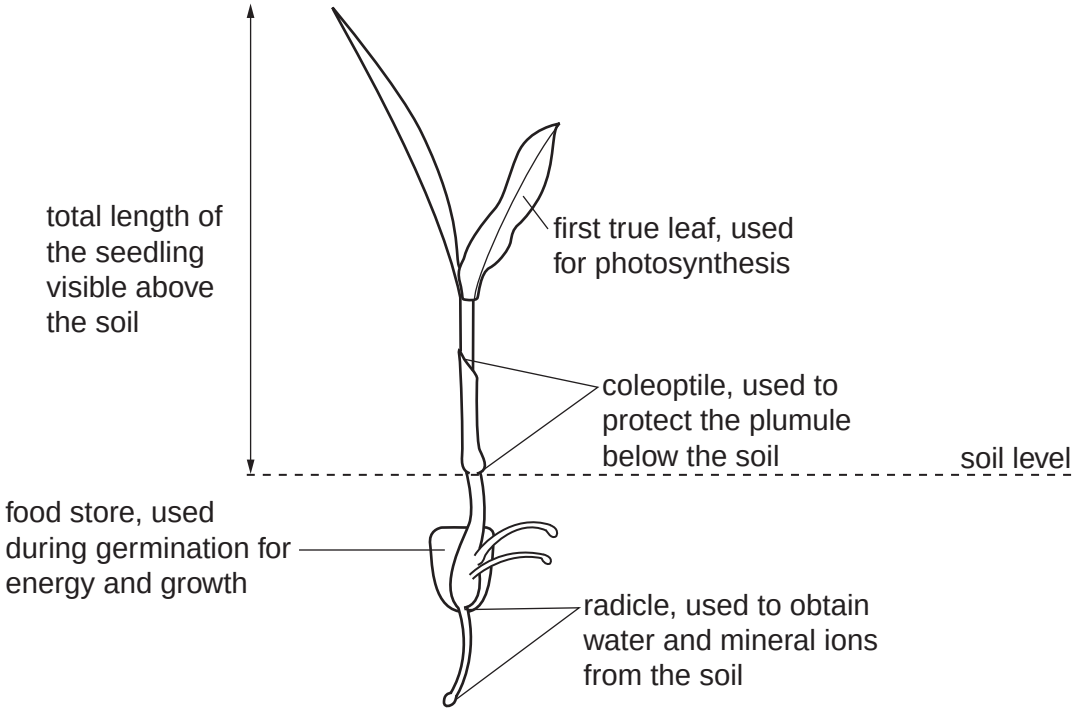


Fig. 1.1

You are going to investigate the effect of light on the germination and early growth of maize. You will measure and observe maize grown in the light and maize grown in the dark.

Three maize grains were planted in each of the two pots labelled **L** and **D**.
One pot (**L**) was placed in the light and the other pot (**D**) placed in the dark.
The seedlings were kept at a constant temperature.

Step 1 Observe the appearance of the seedlings carefully.

(a) Complete Table 1.1 by recording two **visible** differences in the seedlings grown in the light and the seedlings grown in the dark.

Table 1.1

feature	seedlings grown in the light	seedlings grown in the dark

[2]

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You are going to measure the length of the coleoptiles and the total length of the seedlings visible above the soil. You will measure **all** the seedlings grown in the light and **all** the seedlings grown in the dark.

(b) (i) Prepare a table to record your results.

[6]

Step 2 Use a ruler to measure the length of the coleoptile and the total length of the seedling visible above the soil for each seedling.

Record the results for the seedlings grown in pot **L** and in pot **D** in your table.

(ii) Look at Table 1.1 and the results of your measurements.
State **two** conclusions that can be made about the effect of light on the germination and early growth of maize.

1 .....

.....

.....

2 .....

.....

.....

[2]

Use gloves and eye protection while carrying out steps 3 to 14 of the practical work for question 1.

Step 3 Use a marker pen to draw a line down the centre of a white tile.
Label one side **L** and the other side **D**.

Step 4 Use a spatula to carefully dig out from each pot, **two** of the seedlings grown in the light and **two** of the seedlings grown in the dark.

Step 5 Use a scalpel or razor blade to cut the remains of the food store from each of the seedlings.

Step 6 Use the water in the beaker labelled **water for washing** to wash each of these food stores and remove the outer covering. Put the outer covering in the beaker labelled **waste**.

Step 7 Place the food stores from the seedlings grown in the light on the side of the tile labelled **L** and the food stores from seedlings grown in the dark on the side of the tile labelled **D**.

Step 8 Wash the spatula in the beaker labelled **water for washing** and dry it with a paper towel. Use the spatula to crush together the two food stores from the seedlings grown in the light on the part of the tile labelled **L**.

Separate the crushed food store into two equal parts spaced at least 2 cm apart, as shown in Fig. 1.2.

Step 9 Repeat step 8 using the two food stores from the seedlings grown in the dark on the part of the tile labelled **D**.

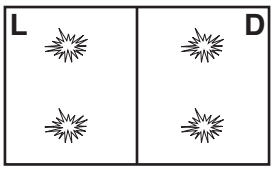


Fig. 1.2

Step 10 Label two test-tubes, one with the letter **L** and the other with the letter **D**.

Step 11 Scrape one of the food stores from the seedlings grown in the light into the test-tube labelled **L**. Add 2 cm^3 of water from the beaker labelled **water**, taking care to wash the crushed food store to the bottom of the test-tube.

Step 12 Repeat step 11 using one of the food stores from the seedlings grown in the dark and the test-tube labelled **D**.

Step 13 Carry out a Benedict's test on the contents of test-tube **L** and test-tube **D**.

Raise your hand when you are ready for hot water to be placed in the beaker labelled **water-bath**.

Leave the test-tubes for 5 minutes.

During this time carry out step 14 and answer question **(c)(i)**.

Step 14 Add 1 drop of iodine solution to the remaining two food stores on the white tile. Record your results in Table 1.2.

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(c) (i) Describe how to carry out a biuret test on a crushed food store.

.....

.....[1]

(ii) The results of a biuret test are recorded in Table 1.2.
Complete step 13 by recording the results of your Benedict's tests in Table 1.2.

Table 1.2

test	seedlings grown in light	seedlings grown in dark
biuret	purple	purple
Benedict's		
iodine		

[2]

(iii) State the conclusion for the results shown in Table 1.2.

.....

.....[1]

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[Turn over

(d) A group of students investigated the changes in dry mass during germination and growth of maize grown in the light and maize grown in the dark.

The dry mass is the total mass left after all the water has been evaporated.

Table 1.3 shows the results of the investigation for the maize seedlings grown in the light.

Table 1.3

	time / days										
	0	2	4	6	8	10	12	14	16	18	20
dry mass of 10 maize seedlings / g	22	20	17	12	10	8	11	13	14	15	17

(i) Describe a method the students could have used to carry out this investigation.

Use the information on **page 2** to help you.

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.....[6]

(ii) Suggest why the students measured the dry mass instead of the mass including water in their investigation.

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.....[1]

[Total: 21]

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2 **(a)** A group of students investigated the effect of two different exercises on the heart rate of ten male and ten female students.

Before the first exercise, the pulse rate at rest was measured and the group then jumped on the same spot for two minutes without moving their arms. Every two seconds an investigator shouted 'jump'.

After two minutes the pulse rate was measured and the students were allowed ten minutes to rest.

Before the second exercise, the pulse rate at rest was measured again and the group was asked to do a different exercise.

The students jumped on the same spot for two minutes lifting their arms above their head as they jumped up and dropping their arms as they came down. Every two seconds an investigator shouted 'jump'.

Table 2.1 shows the results of this investigation.

Table 2.1

activity	average pulse rate / beats per minute		
	male students	female students	all students
resting	68	74	71
after jumping	96	92	
after jumping and moving arms	128	140	

(i) Complete Table 2.1 by writing in the average pulse rate for all students after both forms of exercise.

[2]

(ii) Describe **two** variables in this investigation that have been controlled.

1 .....

.....

2 .....

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[2]

(iii) Explain why the students had to rest before carrying out the second exercise.

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.....[1]

(iv) State **one** variable that cannot be controlled during the exercise and describe the effect of this variable on the results of the investigation.

variable .....

effect on results .....

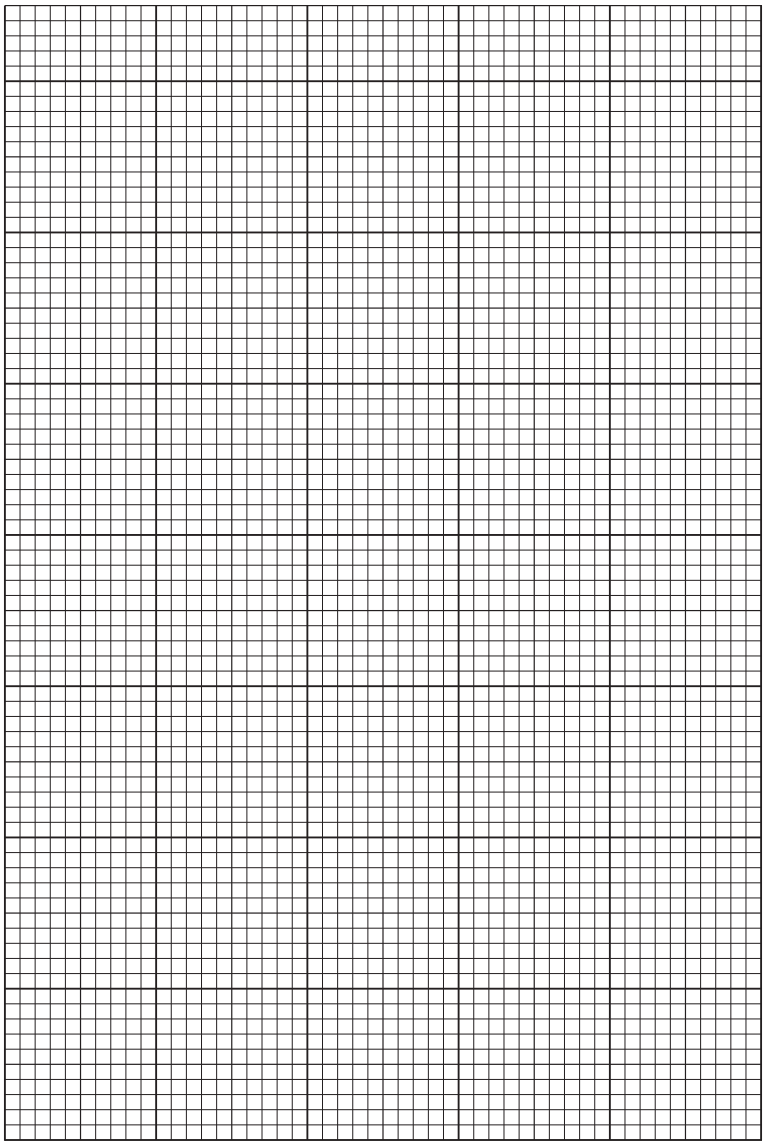
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.....

[2]

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(b) (i) Plot a bar chart of the data in Table 2.1, for both the male and the female students, on the grid.



[4]

(ii) State **one** similarity and **one** difference the effect of exercise has on males and females.

similarity .....

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difference .....

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[2]

(c) Fig. 2.1 shows a photomicrograph of a cross section of an artery from a mammal.

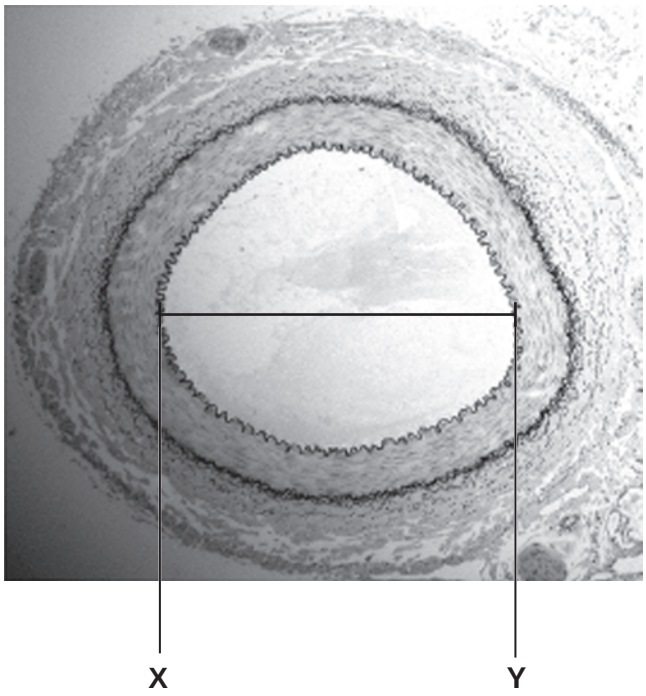


Fig. 2.1

(i) Make a large diagram of this cross section to show the layers forming the wall of the artery.

[3]

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(ii) Measure the diameter of the lumen of the artery between points **X** and **Y** on Fig. 2.1. **Include the unit**.

Diameter of the lumen on Fig. 2.1 .....

Draw a line in the same position on your drawing and measure the diameter of the lumen on your drawing.

Diameter of the lumen on your drawing .....

$$\text{magnification} = \frac{\text{diameter of the lumen on your drawing}}{\text{diameter of the lumen on Fig. 2.1}}$$

Calculate the magnification of your drawing using the equation given and your answers.

Show your working.

magnification .....
[3]

[Total: 19]

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