Cambridge Assessment International Education

Cambridge O Level

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER				

6921290181

BIOLOGY **5090/32**

Paper 3 Practical Test **October/November 2020**

1 hour 15 minutes

You must answer on the question paper.

You will need: The materials and apparatus listed in the confidential instructions

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.

INFORMATION

- The total mark for this paper is 40.
- The number of marks for each question or part question is shown in brackets [ ].

For Examiner's Use	
1	
2	
3	
Total	

This document has **8** pages. Blank pages are indicated.

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In order to plan the best use of your time, read through all the questions on this paper carefully before starting work.

1 When a seed germinates, the stem of the seedling grows upwards.

You are going to investigate differences between seedlings grown in the light and seedlings grown in the dark.

You are provided with approximately 15 seedlings grown in the light and 15 grown in the dark.

(a) **(i)** Examine the seedlings that have been provided. Complete the table to compare the leaf colour, leaf size and stem length of seedlings grown in the light and in the dark.

feature	seedlings grown in light	seedlings grown in dark
leaf colour		
leaf size		
stem length		

[3]

(ii) Select five seedlings grown in the light and five grown in the dark.

Measure the length of each stem to the height of the lowest leaf.

Record your measurements in the table below and calculate the mean lengths.

seedling	stem length in light / mm	stem length in dark / mm
1		
2		
3		
4		
5		
mean length / mm		

[4]

(b) Suggest why the growth observed in the dark might be an advantage to a plant in a shady, forest environment.

.....

..... [1]

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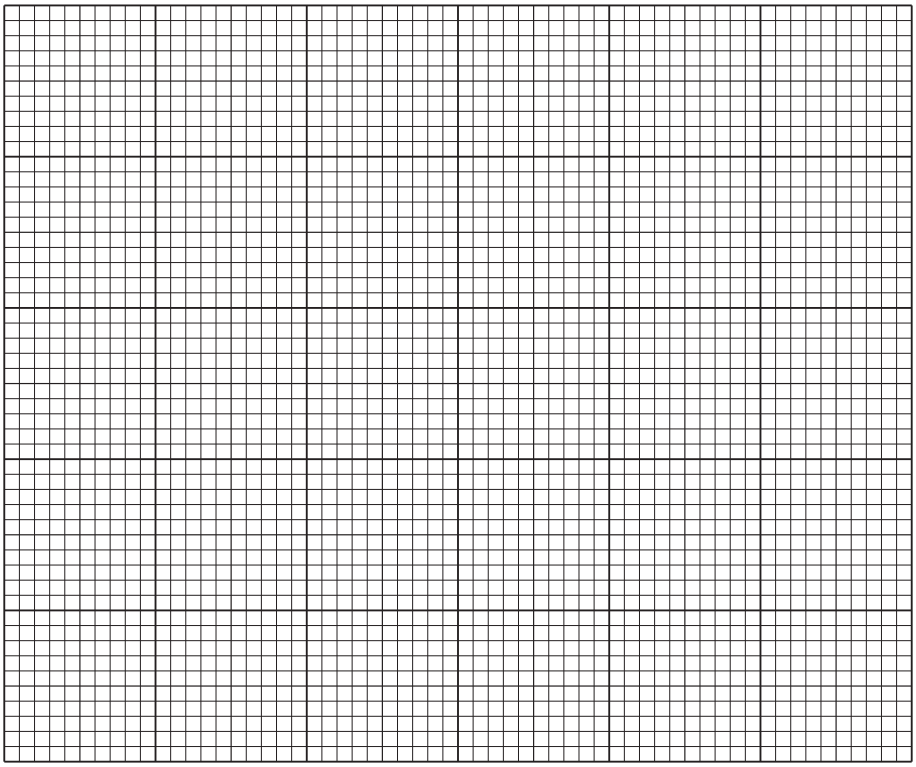
(c) Some scientists wanted to investigate the effect of fertiliser on the growth of wheat. Wheat seeds were planted in soil to which nitrogen fertiliser had been added. After the seedlings had grown to a height of 8 cm, they were measured at regular intervals.

The mean heights of the plants are shown in the table.

time / days	**mean height of plants / cm**
0	8
10	10
30	29
60	58
90	73
110	73

(i) Construct a line graph of the data on the grid below. Join your points with ruled, straight lines.



[4]

(ii) Use your graph to find the mean height of the plants at 50 days. Show your working on the graph.

mean height ..... [2]

(iii) Describe how the rate of growth of these plants changed between days 0 and 110.

.....

.....

.....

.....

.....

..... [3]

(iv) Describe how to complete this investigation to find whether fertiliser does have an effect on the rate of growth of wheat.

.....

.....

.....

..... [2]

(v) Increase in height was used as a measure of growth. Suggest **two** other plant features that could have been used to measure growth.

.....

.....

.....

..... [2]

[Total: 21]

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2 Milk contains casein, a protein that gives it a white colour. You are provided with a solution of powdered milk.

- Mark a cross (**X**) on the outside of the base of a small, empty beaker.
- Place this beaker on the white tile so that you can see the **X** clearly when you look into the beaker.

You are going to add milk to the beaker as you look down on the **X** until the **X** is no longer visible.

You will then record the volume of milk you have added.

You will need to work out how you will measure this volume before you do this.

- Add milk slowly to the beaker as you look down on the **X** until the **X** is no longer visible.

(a) **(i)** Measure and record the volume of milk you added to the beaker.

..... cm^3 [1]

(ii) Describe how you measured this volume.

.....

.....

.....

..... [2]

- Use the dropper provided to add dilute hydrochloric acid (HC*l*) to the milk in the beaker drop by drop until the **X** becomes visible. **Take care when handling hydrochloric acid.**

(iii) Describe what happens to the milk as the **X** becomes visible.

.....

..... [1]

(b) Some protease enzymes can digest casein in milk and the milk becomes colourless. Not all protease enzymes can digest casein.

A fruit contains a protease enzyme. Using a method similar to the one above, design an investigation to find out whether this fruit protease will digest casein.

.....

.....

.....

.....

.....

.....

.....

..... [4]

[Total: 8]

3 The photograph shows the bone from the upper leg (between the hip and knee) of two different adult humans. The bones are labelled **C** and **D**.

C **D** **magnification ×0.17**

(a) Use the table to describe **two** differences between bones **C** and **D** as they appear in the photograph.

	bone C	**bone D**
1		
2		

[2]

(b) Make a large drawing of **bone C** in the space below.

[5]

(c) **(i)** On the photograph measure the length of **bone D**.

..... mm [1]

(ii) Use your measurement to calculate the actual length of **bone D**.

Show your working.

..... [3]

[Total: 11]

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