Cambridge
O Level

Cambridge International Examinations
Cambridge Ordinary Level

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

7987194861

BIOLOGY **5090/31**

Paper 3 Practical Test **May/June 2015**

1 hour 15 minutes

Candidates answer on the Question Paper.

Additional Materials: As specified 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.
Write your answers in the spaces provided on the Question Paper.

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	
3	
Total	

This document consists of **9** printed pages and **3** blank pages.

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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 You are provided with several bean seeds which have been soaked in water.

(a) Carefully cut one of the beans vertically into two halves. In the space below, make a drawing of one of the halves. On your drawing, label the cotyledon and the testa.

[3]

(b) Catalase is an enzyme found in many different tissues. Catalase breaks down hydrogen peroxide, forming water and oxygen.

You are required to carry out an experiment to compare the amounts of catalase in the cotyledons and testa of a bean seed.

- Put 5 cm^3 of hydrogen peroxide into each of two test-tubes.
- Carefully separate the testa from the cotyledons of a bean seed.
- Keeping the testa and the cotyledons separate, cut both into small pieces.
- Add the pieces of testa to one test-tube containing hydrogen peroxide and the pieces of cotyledon to the other test-tube containing hydrogen peroxide.
- Observe any changes in the test-tubes for two minutes.

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(i) Record your observations in Table 1.1.

Table 1.1

part of bean seed	observations
testa	
cotyledons	

[2]

(ii) State what you conclude about the amount of catalase in the testa and in the cotyledons from your observations in Table 1.1.

.....

.....

.....

.....[2]

(iii) Suggest an explanation for the difference in the amount of catalase found in the testa and in the cotyledons.

.....

.....

.....[1]

(iv) Suggest **one** way in which this experiment could be improved.

.....

.....

.....[1]

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[Turn over

(c) Using another soaked bean seed, carry out a test to show whether its testa and its cotyledons contain starch.

(i) Describe how you carried out this test.

.....

.....

.....

.....

.....

.....[2]

(ii) After completing this test, state your conclusions.

.....

.....

.....[1]

(d) Cereal grains, such as maize and barley, store carbohydrates.

An investigation was carried out to measure the activity of the enzyme amylase in barley grains during germination.

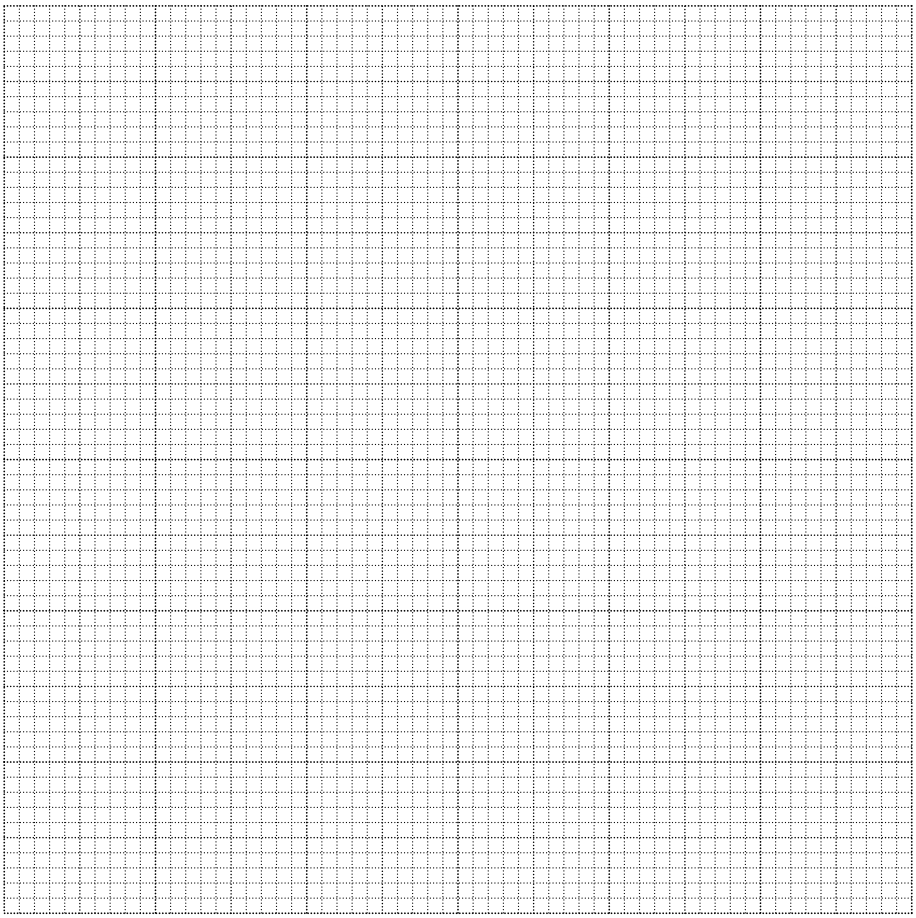
The results are shown in Table 1.2.

Table 1.2

germination / days	amylase activity / arbitrary units
0	0.2
2	0.8
4	2.0
6	3.0
8	8.0
10	6.5

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(i) Construct a line graph of the data in Table 1.2 on the grid below.
Join your points with ruled, straight lines.



[4]

(ii) Use your graph to find the amylase activity after 5 days of germination.

..... arbitrary units [1]

(iii) Suggest the role of amylase in germinating barley grains.

.....

.....

.....

.....[2]

[Total: 19]

2 **(a)** Fig. 2.1 shows two palisade cells in a section through a leaf, as seen using a microscope.

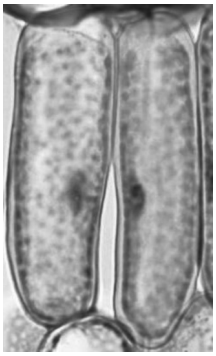


Fig. 2.1

(i) In the space below, make an accurate drawing of these two cells.
Your drawing should be 2.0 × larger than the cells in Fig. 2.1.
You do not need to label your drawing.

[5]

(ii) State **two** visible features of the cells in Fig. 2.1 which are not present in animal cells.

1 .....

2 .....[2]

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(b) Fig. 2.2 shows a transverse section through a vascular bundle found in the stem of a plant, as seen using a microscope.

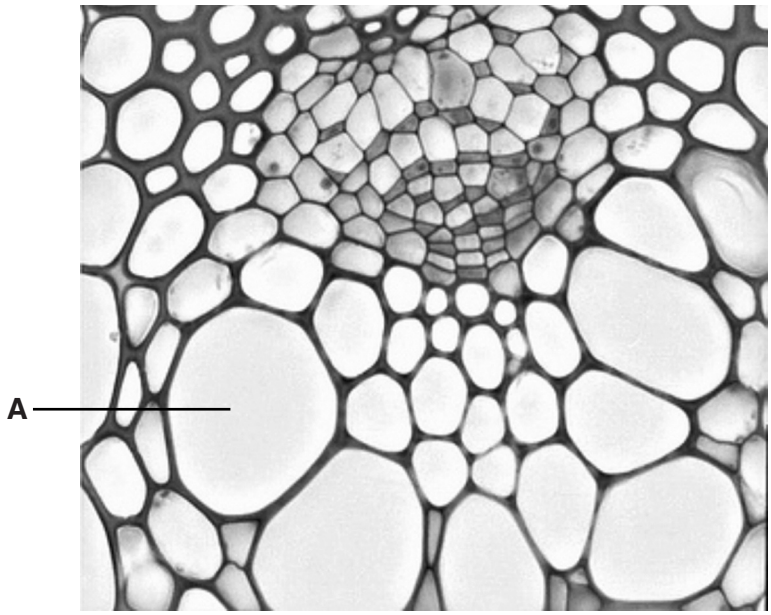


Fig. 2.2

(i) Identify the part labelled **A** in Fig. 2.2.

..... [1]

(ii) State **two** functions of part **A**.

1 .....

.....

2 .....

.....[2]

(c) Describe an investigation you could carry out in the laboratory to show the path taken by water in a cut stem of a plant.

.....

.....

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.....[4]

[Total: 14]

3 Fig. 3.1 shows the bones of the forelimb of a rabbit. The radius is labelled.

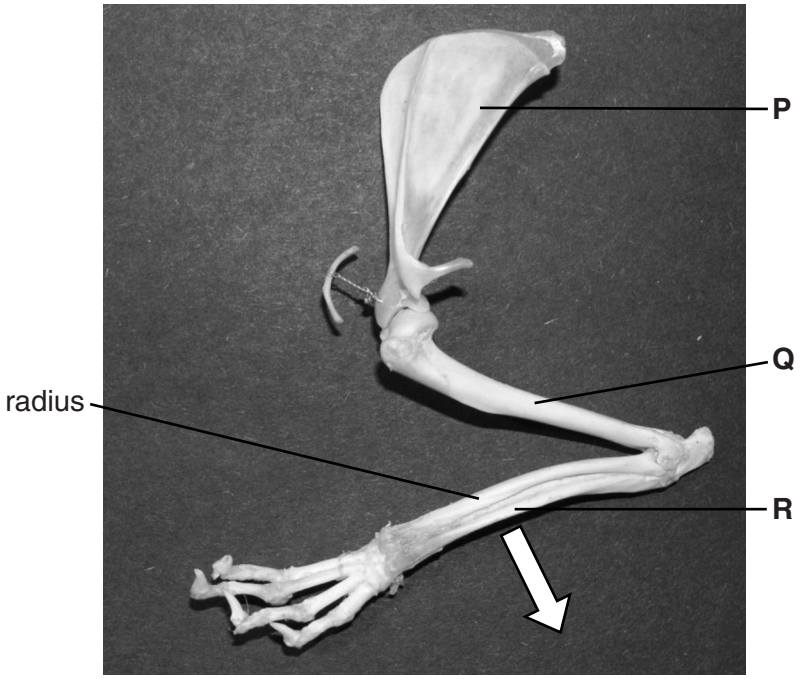


Fig. 3.1

(a) Identify the bones labelled **P**, **Q** and **R**.

P .....

Q .....

R .....

[3]

(b) State the type of joint formed between bones **Q** and **R**.

.....[1]

(c) Describe how, in a living rabbit, the lower part of the forelimb would be moved in the direction indicated by the arrow in Fig. 3.1.

.....

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.....

.....

.....

.....[3]

[Total: 7]

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