UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

BIOLOGY **5090/03**

Paper 3 Practical Test **May/June 2009**

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 work you hand in.
Write in dark blue or black pen.
You may use a pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **both** questions.
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 document consists of **7** printed pages and **1** blank page.

1 Table 1.1 shows boxes for the full set of adult human teeth (32 in total).

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Table 1.1

tooth	molar			premolar		can-ine	incisor				can-ine	premolar		molar		
upper jaw																
lower jaw																

↑
centre front

Use the mirror provided to observe your own teeth.

(a) (i) Count the number of teeth you have and record it below.

Number of teeth ..... [1]

(ii) Make a record of your own teeth by putting a 'X' for each tooth present in the appropriate box in Table 1.1. [1]

(iii) Explain briefly why the third (last) molars may not be present in teenagers.

.....

.....[1]

(iv) Outline the functions of teeth during the intake of food.

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.....

.....

.....[2]

Dental hygiene is important for healthy gums and teeth.

- Rub the two sterile (unused) cotton buds around the inside of your mouth over your gums and teeth.
- Dip one cotton bud into the sugar provided so that it sticks to the surface of the cotton bud.
- Leave the other cotton bud without sugar.
- Lay both in the shallow dish provided, the one without sugar on the left.
- Add 2 or 3 drops of universal indicator solution to each cotton bud.

(b) **(i)** In Table 1.2, record the colour of the indicator solution **immediately** after it was put on to the cotton buds.

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Table 1.2

	colour at start	colour after 30 minutes
cotton bud without sugar		
cotton bud with sugar		

- Leave the cotton buds in the dish and observe after 30 minutes.

CONTINUE WITH THE REST OF THE PAPER DURING THIS 30 MINUTES.

Then, in Table 1.2, record the colours of the indicator solution after it has been on the cotton buds for 30 minutes. [2]

(ii) Use the colour chart provided to help you explain the observations you have recorded in Table 1.2.

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.....

.....

.....[3]

Saliva in the mouth may contain an enzyme, amylase, that acts on the substrate, starch.

(c) Describe how you could carry out a test to show the presence of

(i) the substrate,

.....

.....

.....

(ii) the product of the action of amylase on starch.

.....

.....

.....[4]

[Turn over

You are provided with amylase and starch solutions in labelled test-tubes.

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Read through the following instructions and then carry them out.

- Pour a small amount of amylase solution into two clean test-tubes.
- Carry out the test for the presence of starch in one tube and the test for the product in the other tube.
- Pour a small amount of starch solution into two clean test-tubes.
- Carry out the test for the presence of starch in one tube and the test for the product in the other tube.

Note: Make sure that you leave sufficient untested amylase and starch solution to complete the rest of this experiment.

(d) (i) Record the results of this first set of tests in Table 1.3 below.

Table 1.3

test		test for starch	test for product
first set	amylase		
	starch		
second set **with salt added**			
second set **without salt added**			

Read through the following instructions and carry them out.

- Label a clean test-tube **S**.
- In a large test-tube mix together the remainder of the amylase and starch solutions you were given.
- Shake the mixture and pour half of it into test-tube **S**.
- To this tube (**S**), add 4 drops of sodium chloride (salt) solution.
- Shake both tubes of mixture.
- Using clean test-tubes, test the mixture in tube **S** (with added salt) and the mixture in the other tube (without added salt) for both starch and the product.
- Record your results in Table 1.3. [5]

(ii) Suggest explanations for your results recorded in Table 1.3.

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.....

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.....

.....

.....[3]

[Total: 22]

MAKE SURE YOU HAVE COMPLETED Question 1(b)(i) AND (ii).

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2 You are provided with three samples of seeds from the same dicotyledonous plant that have been soaked in water and left for 4 days, under different conditions:

S1 – at 4 °C in the dark.
S2 – at 20 °C in the dark.
(These are wrapped in silver foil to ensure that they are still in the dark. Unwrap them only when you are ready to use them.)
S3 – at 20 °C in the light.

Read through question (a), (b) and (c) before starting.

(a) Use a specimen of each of **S1**, **S2** and **S3** to complete Table 2.1 by making drawings, recording measurements and giving descriptions as appropriate.

Table 2.1

specimen	labelled drawing	maximum length of sample	description
S1			
S2			
S3			

[8]

(b) Use the information you have been given and your observations of the specimens to suggest explanations for

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(i) the differences between **S1** and **S2**,

.....

.....

.....

.....

.....[2]

(ii) the differences between **S2** and **S3**.

.....

.....

.....

.....

.....[2]

- Take another of the **S2** seedlings and cut it to remove the root tip (1 cm).
- Mount this tip on a slide without a coverslip or stain.
- Use a hand lens to observe the root tip.

(c) **(i)** Make a labelled drawing to show any structures that you observe.

[2]

(ii) State the main functions of these structures.

.....

.....[1]

(d) Fig. 2.1 shows the cells in a section through a root tip. The section has been stained with a stain for deoxyribonucleic acid, DNA.

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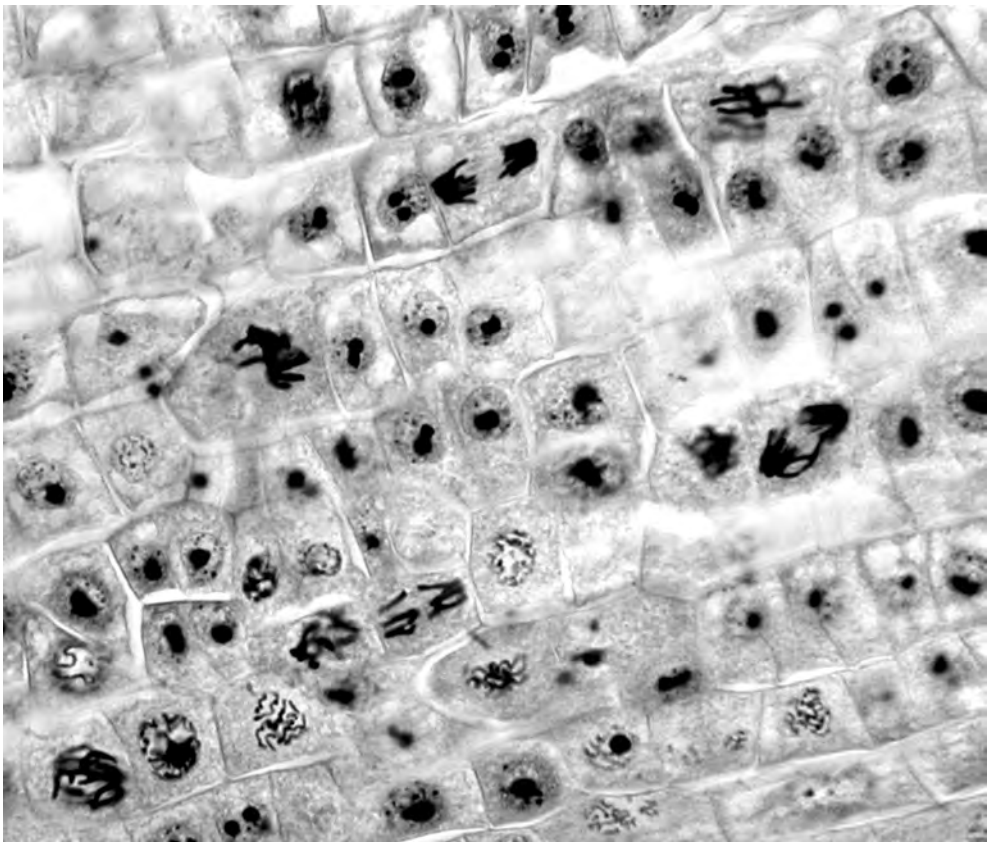

Fig. 2.1

(i) State the type of cell division shown in these cells.

.....[1]

(ii) Describe how these cells differ from cells found in other parts of the root.

.....

.....

.....[2]

[Total: 18]

WHEN YOU HAVE FINISHED PLACE YOUR USED COTTON BUDS IN THE DISINFECTANT PROVIDED.

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