Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME	

CENTRE NUMBER		CANDIDATE NUMBER	

4524286621

BIOLOGY **0610/53**

Paper 5 Practical Test **October/November 2015**

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	
3	
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 **12** printed pages.

DC (LK/JG) 102605/3

CAMBRIDGE International Examinations

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

You should wear the eye protection provided during the practical work in question 1.

1 You are provided with some fresh milk, labelled **milk**.

(a) You are going to test the milk for protein.

(i) State the reagent you will use to test the milk for protein.

....[1]

(ii) Carry out the test for protein on approximately 2 cm^3 of the milk.

Observe and record any colour change. State a conclusion from your observations.

colour change ....

conclusion ....
[1]

(iii) You are expected to wear eye protection for this test.
State **one** other safety procedure you should follow.

....

....[1]

(b) You are going to investigate the effect of an enzyme on the milk.

This enzyme is found in the stomach of young mammals. It causes milk to form insoluble clots. This makes the milk easier to digest.

You are provided with an enzyme solution, labelled **enzyme**.

- Label a clean large test-tube, **No X**.
- Add 5 cm^3 of fresh milk into the large test-tube **No X**.
- Stand large test-tube **No X** in a beaker of water at 40 °C for one minute.
- Add 1 cm^3 of the enzyme solution to the milk in the large test-tube **No X**.
- Start timing.
- Gently tilt and roll the large test-tube as shown in Fig. 1.1. You can remove the large test-tube from the water to do this. This should form a film of milk on the inside of the large test-tube.

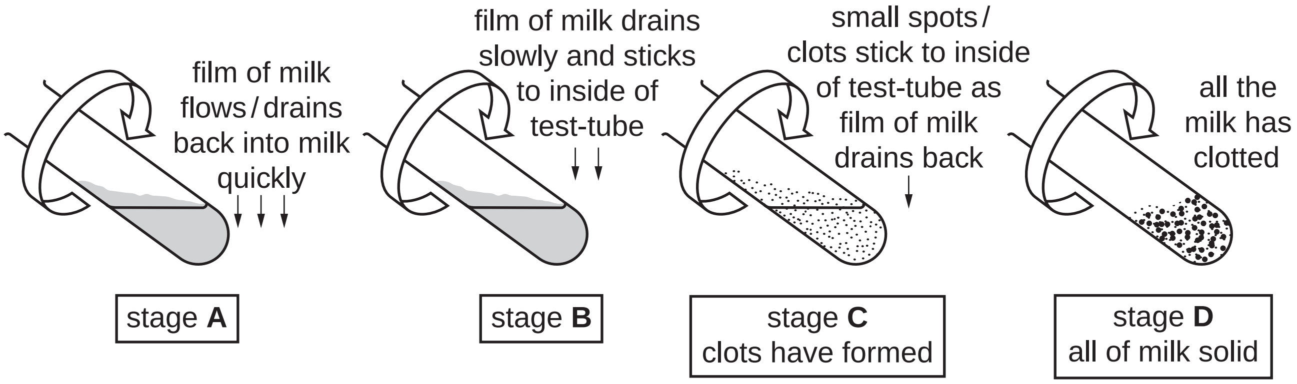

Fig. 1.1

- Roll the large test-tube continuously until stage **C** is reached and clots are formed, as shown in Fig. 1.1 and Fig. 1.2. If it takes longer than three minutes for clots to form, stop rolling the large test-tube and continue with the rest of question **(b)**.

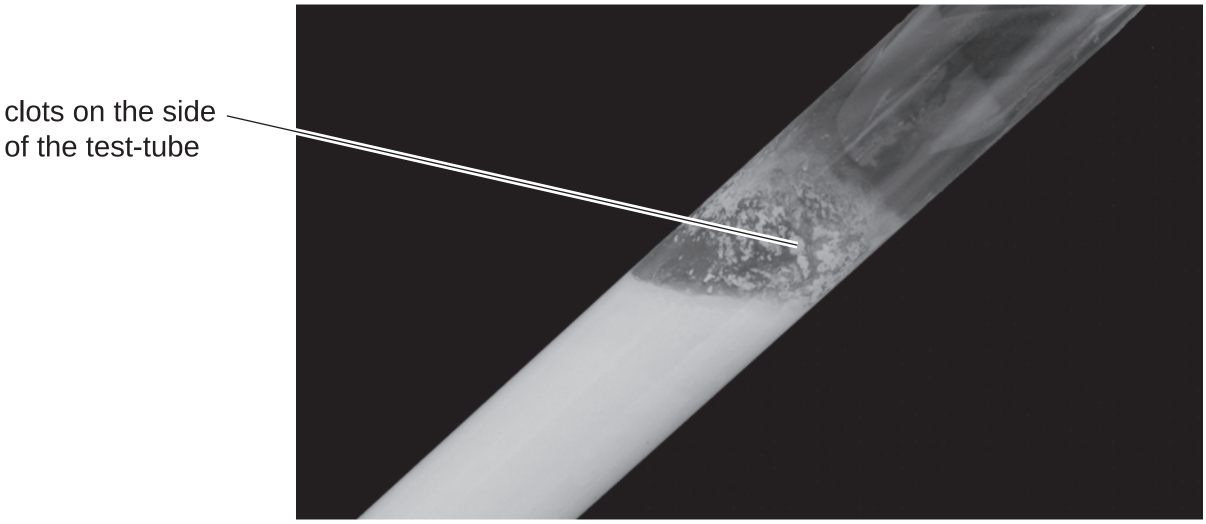

Fig. 1.2

- Record the time taken for clots to form in minutes and seconds. If more than three minutes, record your time as 'more than three minutes'.

  time taken for clots to form ....

  Convert the time into seconds.

  time taken for clots to form .... s

[1]

(c) You are going to investigate how chemical **X** affects the speed of the clotting process.

You are provided with two different concentrations of solution **X**. These are labelled **X1** and **X2**.

You will add each of these solutions in turn to a mixture of milk and enzyme and record how long it takes for clots to form in the milk.

Prepare a table to record your results. Your table should include your results for **No X** as well as for **X1** and **X2**.

- Label two clean large test-tubes **X1** and **X2**.
- Add 5 cm^3 of fresh milk into each of the large test-tubes.
- Raise your hand for a fresh supply of water at 40 °C.
- Stand the test-tubes in the beaker of water at 40 °C for one minute.

- Add 5 cm^3 of solution **X1** to the large test-tube labelled **X1**.
- Add 1 cm^3 of the enzyme solution to the large test-tube **X1**.
- Start timing.
- Gently tilt and roll the large test-tube as before. Roll the large test-tube continuously until clots begin to form, as shown at stage **C** in Fig. 1.1.

- Repeat this procedure using solution **X2**.
- Record the times taken for the milk to clot in large test-tubes **X1** and **X2** in your results table.

[5]

(d) Using your results, describe the pattern shown.

....

....

....

....

....

....[3]

(e) The volume of milk in each test-tube was 5 cm^3 throughout the experiment.

Suggest why this is important.

....

....[1]

(f) In part **(c)**, you were given a fresh supply of water at 40 °C.

Explain why this was necessary.

....

....

....

....[2]

(g) Enzymes usually have a pH at which they work fastest. This is called the optimum pH.

Fig. 1.3 shows the rate of activity of three different enzymes over a range of pH values.

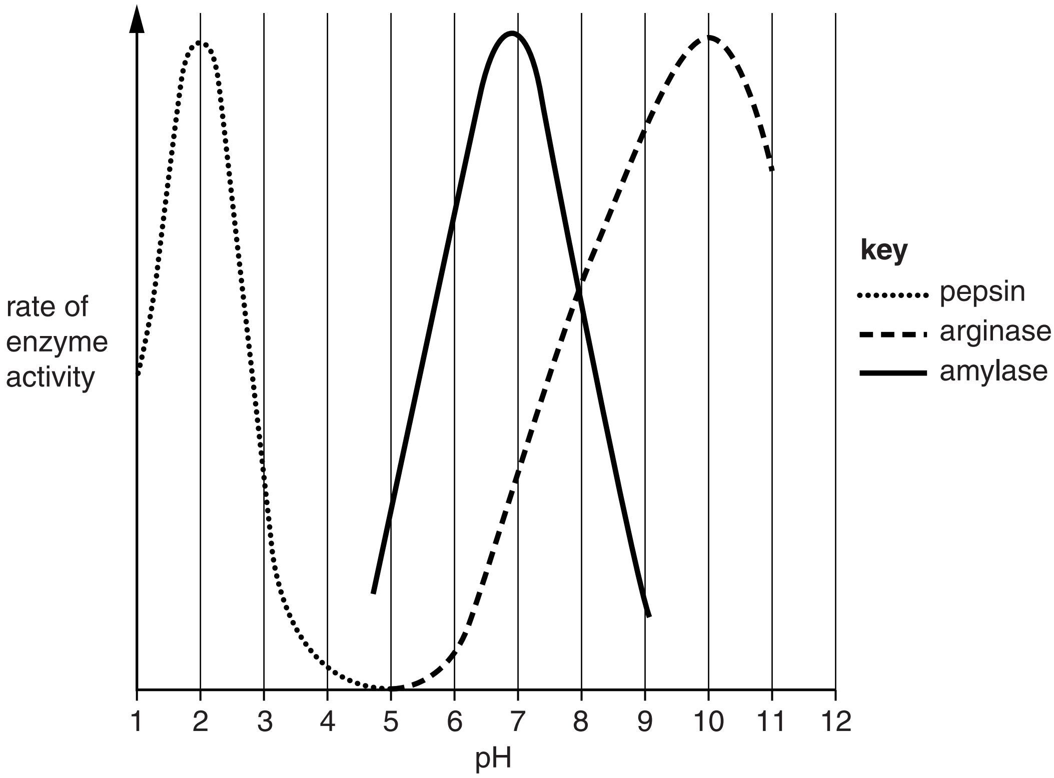

Fig. 1.3

(i) State the optimum pH for arginase.

....[1]

(ii) Your stomach contains acid. Suggest which enzyme is most likely to be found in your stomach.

....[1]

[Total: 17]

2 You are provided with a leaf.

Use the hand lens to observe the leaf.

(a) Draw a large diagram of the upper surface of the leaf.

[3]

(b) A group of students investigated the rate of transpiration from four leaves.

They covered different surfaces of the leaves with petroleum jelly. Petroleum jelly creates a waterproof barrier.

They then measured the mass of each leaf.

The leaves were left hanging from a piece of string in a warm place for 24 hours.

The students then measured the mass of each leaf again.

Table 2.1 shows their results.

Table 2.1

leaf	surfaces covered with petroleum jelly	mass at start / g	mass at end / g	percentage decrease in mass / %
P	upper and lower	4.8	4.6	4.2
Q	upper only	4.6	4.1	10.9
R	lower only	4.6	4.3	6.5
S	none	4.2	3.5	

(i) Calculate the percentage decrease in mass for leaf **S**.

Show your working.

Write your answer to one decimal place.

.... %
[2]

(ii) Suggest why it is important to calculate the percentage decrease in mass for each leaf.

....

....

....

....[2]

(iii) Plot a bar chart to show the percentage decrease in mass for each leaf.

[4]

(iv) Use the results to explain whether the upper or lower surface of the leaf loses the most water.

....

....[1]

(c) The students decided to investigate how temperature affects the rate of transpiration.

Suggest the variable they should change (independent variable), the variables they should control (control variables) and the variable they should measure (dependent variable).

independent variable

....

control variables

....

....

....

dependent variable

....
[4]

[Total: 16]

3 Fig. 3.1 is a photomicrograph of some human blood cells.

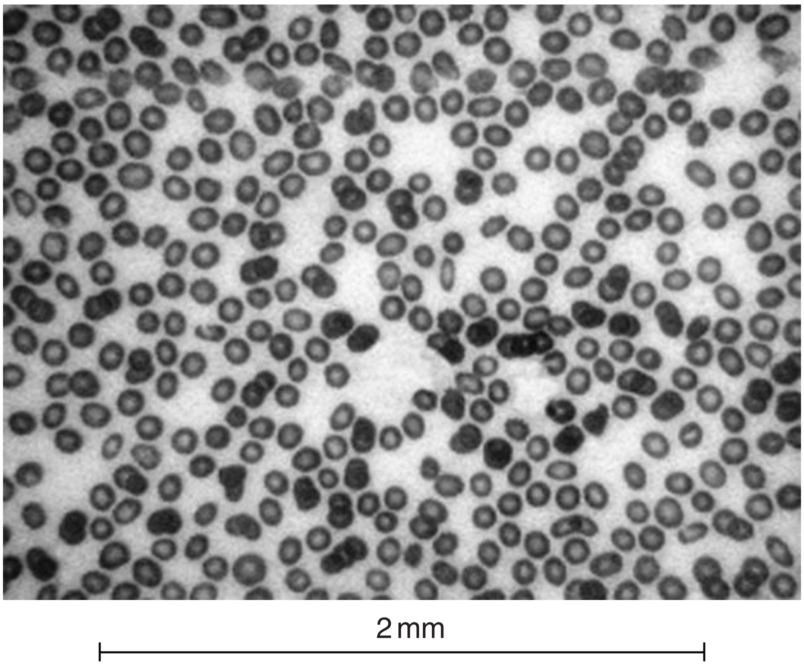

Fig. 3.1

Fig. 3.2 is a photomicrograph of some frog blood cells.

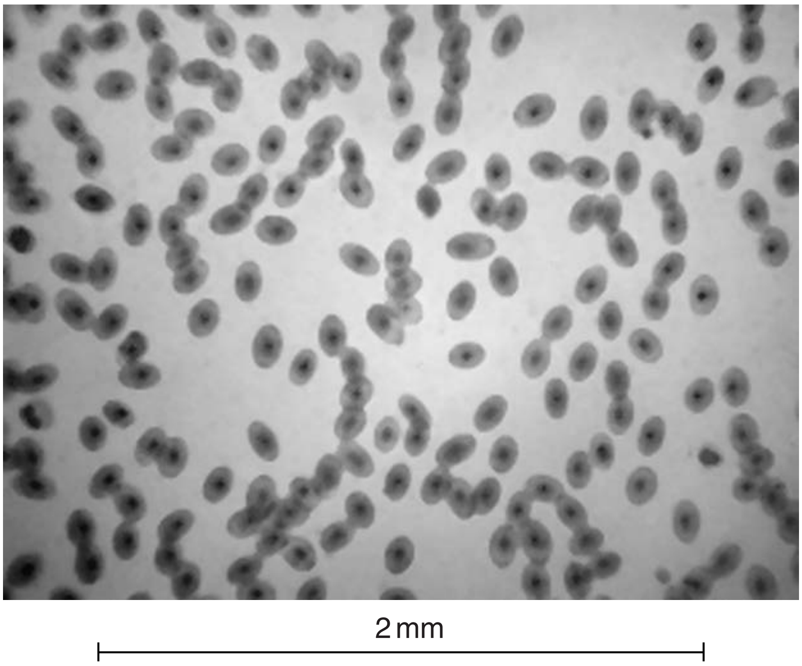

Fig. 3.2

(a) Complete Table 3.1 to show how human red blood cells are different from frog red blood cells.

Table 3.1

feature	human red blood cells	frog red blood cells

[3]

(b) Both photomicrographs have the same magnification.

Measure the length of the scale bar in millimetres.

length of scale bar .... mm

Use the scale bar to calculate the magnification of the photomicrographs.

Show your working.

Give your answer to the nearest whole number.

magnification × ....
[3]

(c) The structure of frog red blood cells means that they can undergo a process that human red blood cells cannot.

Suggest what this process might be.

....[1]

[Total: 7]