



**Cambridge International Examinations**  
Cambridge International General Certificate of Secondary Education

CANDIDATE  
NAME

CENTRE  
NUMBER

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**BIOLOGY**

Paper 3 Extended

**0610/33**

**May/June 2015**

**1 hour 15 minutes**

Candidates answer on the Question Paper.

No Additional Materials are required.

**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.

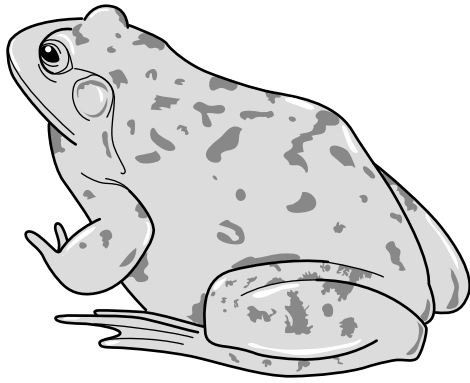
At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [ ] at the end of each question or part question.

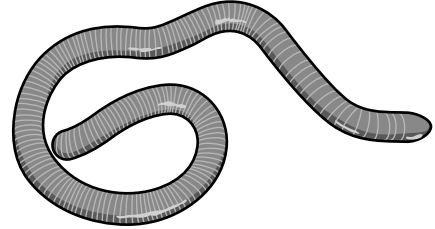
The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **20** printed pages.

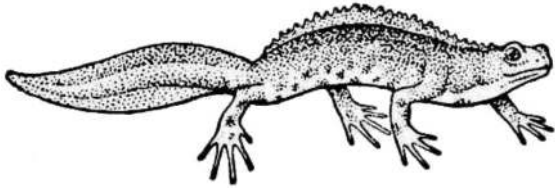
1 Fig. 1.1 shows seven different species of amphibian.



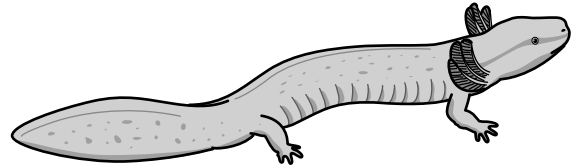
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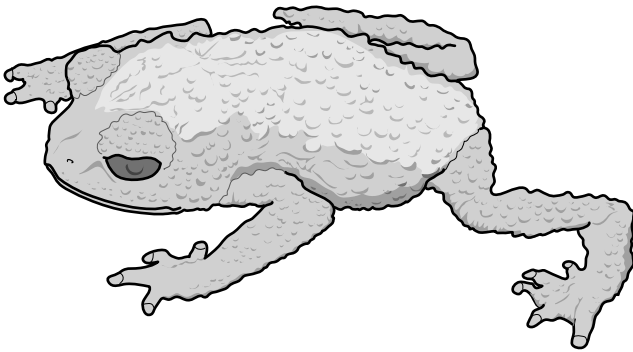
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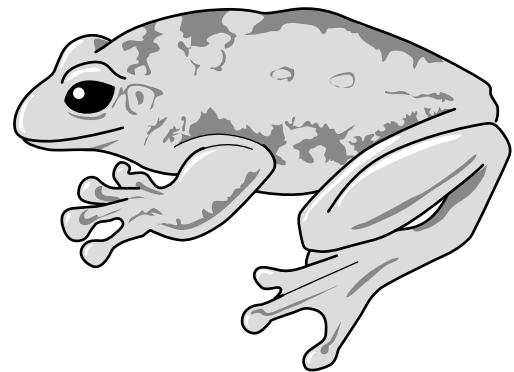
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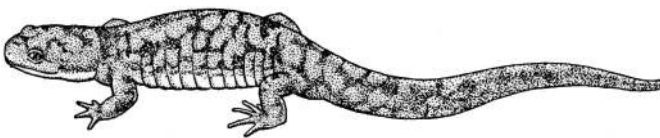
D



E



F



G

not drawn to scale

Fig. 1.1

(a) Use the key to identify each species. Write the letter of each species (A to G) in the correct box beside the key. One has been done for you.

**Key**

1 (a)	long, narrow body, with or without legs	go to 2	
(b)	body not long and narrow, back legs are larger than the front legs	go to 5	
2 (a)	body without legs	<i>Gymnopsis multiplicata</i>	<b>B</b>
(b)	body with legs which are all of the same size	go to 3	
3 (a)	raised crest along the back of the body	<i>Triturus cristatus</i>	
(b)	no crest along the back of the body	go to 4	
4 (a)	gills present	<i>Necturus maculosus</i>	
(b)	no gills present	<i>Ambystoma tigrinum</i>	
5 (a)	skin is smooth	go to 6	
(b)	skin is not smooth	<i>Oreophrynella quelchii</i>	
6 (a)	digits end in swellings	<i>Polypedates leucomystax</i>	
(b)	digits do not end in round swellings	<i>Rana temporaria</i>	

[3]

(b) Many amphibian species throughout the world are endangered.

Suggest **three** reasons why many amphibian species are endangered.

- 1 .....
- .....
- 2 .....
- .....
- 3 .....
- .....

[3]

[Total: 6]

[Turn over

- 2 Some plants can be grown in water using the technique of hydroponics. The roots are in water and supplied with the ions that they need at the concentrations that support maximum growth. Some ions can be absorbed both by diffusion and by active transport.

(a) (i) State **two** features of diffusion that do not apply to active transport.

1 .....

.....

2 .....

.....

[2]

(ii) Explain how roots are adapted to absorb ions.

.....

.....

.....

.....

.....

.....

[2]

A group of students investigated the effect of soaking small onion bulbs in different concentrations of sodium chloride solution. They peeled off the outer papery leaves of the onion bulbs and divided the onions into 6 batches, each with 10 onions.

The onions were surface dried with paper towels and weighed. The mean mass of the onions in each batch was calculated. The onions were then left in sodium chloride solutions for three hours.

After three hours the students surface dried the onions and weighed them again. Their results are given in Table 2.1.

**Table 2.1**

concentration of sodium chloride solution /g dm <sup>-3</sup>	mean mass of onions/g		percentage change in mass
	before soaking	after soaking for 3 hours	
0	147	173	+17.7
25	153	165	+7.8
50	176	172	-2.3
100	154	149	-3.2
150	149	142	-4.7
200	183	175	

- (b) (i) Calculate the percentage change in mass of the onions that were in the most concentrated solution of sodium chloride. Show your working. Write your answer in Table 2.1.

[2]

- (ii) Explain why the students calculated the percentage change in mass of the onions.

.....

.....

.....

.....

.....

.....[2]

- (c) The students plotted a graph of the results as shown in Fig. 2.1.

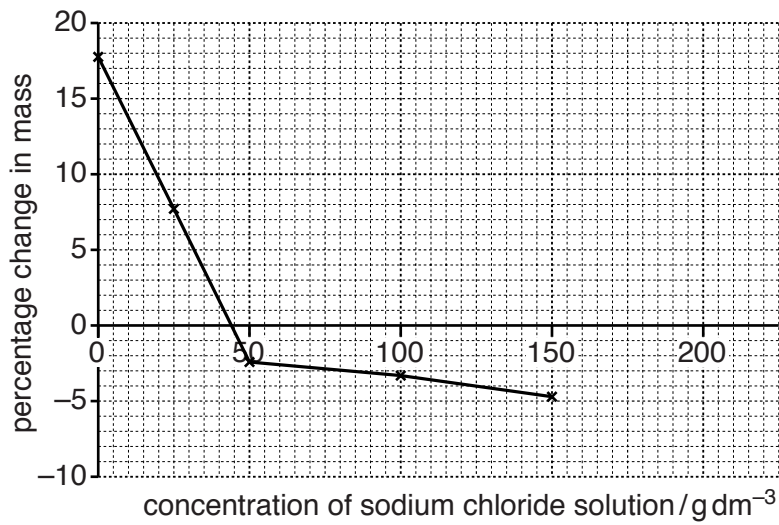


Fig. 2.1

- (i) Complete the graph using your answer to (b)(i). [1]

- (ii) Use the graph in Fig. 2.1 to estimate the concentration of the sodium chloride solution that has the same water potential as the onions.

.....[2]

(d) Using the term **water potential**, explain why the onions:

gained mass when soaked in dilute solutions of sodium chloride

.....

.....

.....

.....

lost mass when soaked in concentrated solutions of sodium chloride.

.....

.....

.....

.....

[4]

[Total: 15]

**Question 3 begins on page 8.**







4 The lungs and the kidneys are excretory organs of the human body.

(a) (i) Define the term *excretion*.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....[3]

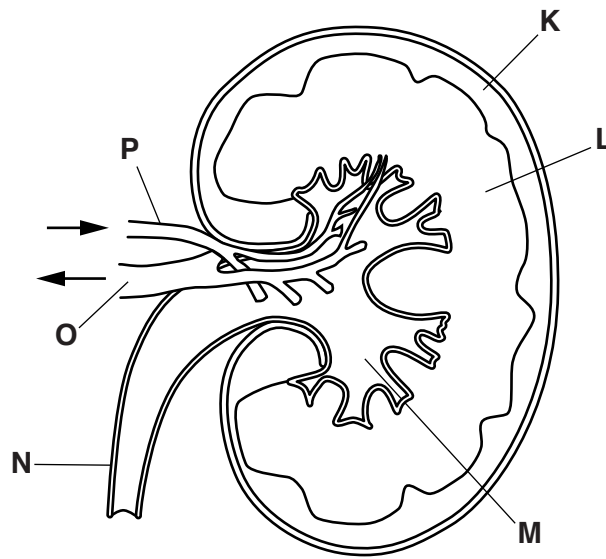
(ii) State an excretory product that is passed out through the lungs.

.....[1]

(iii) Outline the role of the liver in excretion.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....[3]

(b) Fig. 4.1 is a vertical section of the kidney.



**Fig. 4.1**

Table 4.1 shows the functions of parts of the kidney.

Complete the table by:

- naming the part of the kidney that carries out each function
- using letters from Fig. 4.1 to identify the part of the kidney named.

One row has been completed for you.

**Table 4.1**

function	name of part	letter from Fig. 4.1
blood is filtered		
concentration of urine is determined	medulla	<b>L</b>
urine flows to the bladder		
blood is carried into the kidney		
blood flows out of the kidney		

[4]

(c) People with kidney disease are often treated in renal dialysis clinics. Their blood passes through tubes lined with a special membrane for about three hours.

(i) State **two** waste substances that are removed from the blood by dialysis.

1 .....

2 .....

[2]

(ii) Kidney patients may be given a kidney transplant. State **one** advantage and **one** disadvantage of kidney transplants compared with dialysis.

advantage .....

.....

.....

disadvantage .....

.....

.....

[2]

[Total: 15]

**Question 5 begins on page 14.**

5 The menstrual cycle involves monthly changes in the ovary and the uterus.

(a) Fig. 5.1 shows the sequence of changes within the ovary that occur during the menstrual cycle.

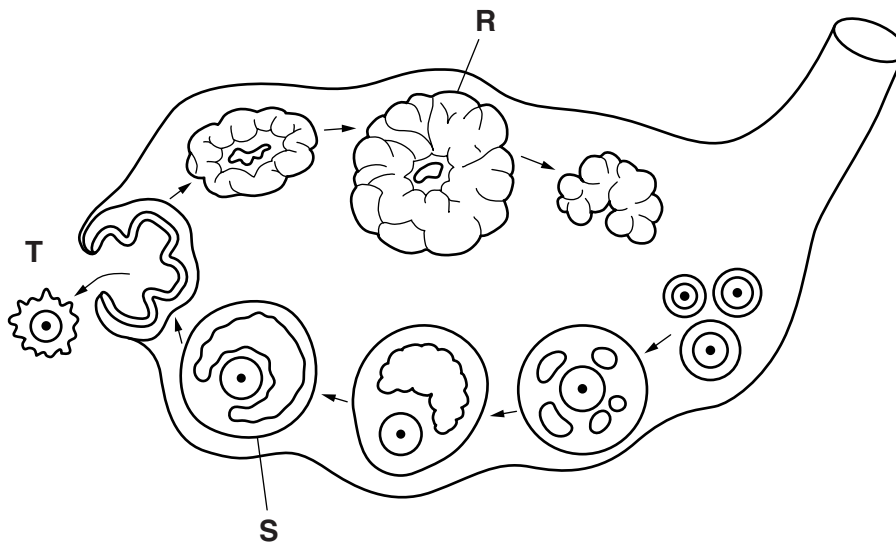


Fig. 5.1

(i) Name structures R and S.

R .....

S .....

[2]

(ii) State the name of the process that is occurring at T.

.....[1]

(b) The ovary secretes hormones that control the growth and maintenance of the lining of the uterus.

Name the hormone that stimulates:

(i) the growth of the lining of the uterus during the first half of the menstrual cycle

.....[1]

(ii) the maintenance of the lining of the uterus during the second half of the menstrual cycle.

.....[1]









- 6 Some integrated farming systems involve making best use of all available resources without the use of large inputs of energy in the form of fossil fuels.

A study looked at what happened to the light energy that was the major energy input to farms in the Zhujiang delta in China. The farms are based on a dyke-pond system as shown in Fig. 6.1.

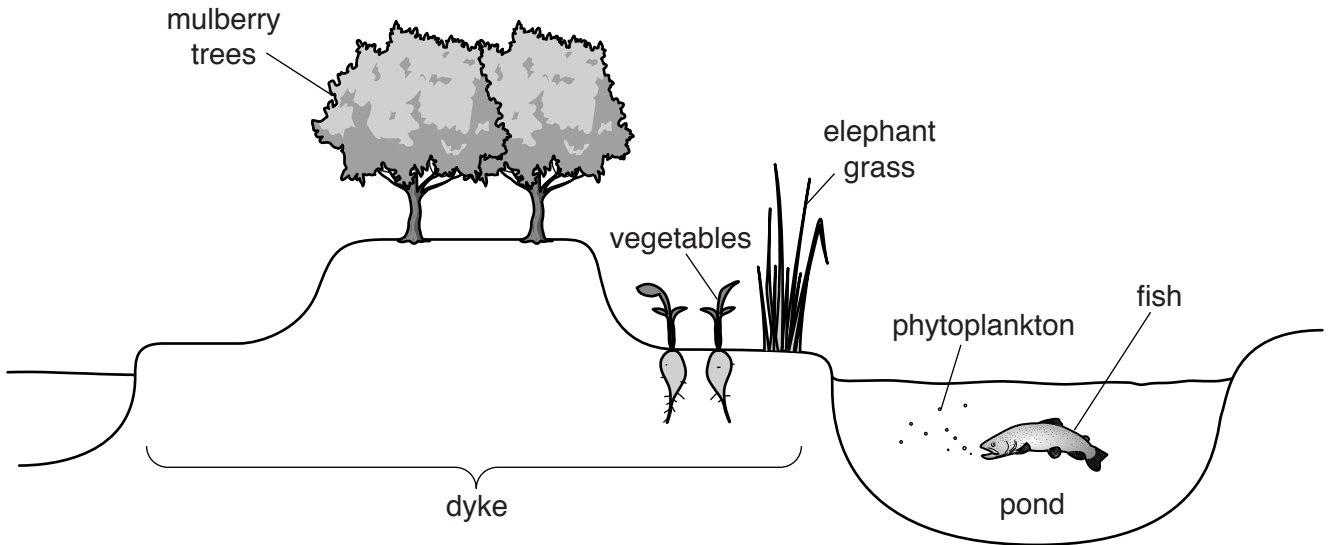


Fig. 6.1

Elephant grass, vegetables and mulberry trees are grown on the dykes in between the ponds. The elephant grass is grown and then cut to feed the fish. Vegetables and fish are used for human consumption. Silkworms feed on the mulberry trees. Phytoplankton are the main producers in the pond and are eaten by the fish.

- (a) (i) Explain the meaning of the term *producer*.

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.....[2]



