

Surname	Centre Number	Candidate Number
Other Names		0



GCSE

0239/01

**ADDITIONAL SCIENCE
FOUNDATION TIER
BIOLOGY 2**

A.M. TUESDAY, 15 May 2012

45 minutes

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1	7	
2	6	
3	6	
4	8	
5	8	
6	7	
7	4	
8	4	
Total	50	

ADDITIONAL MATERIALS

In addition to this paper you may require a calculator and a ruler.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided in this booklet.

INFORMATION FOR CANDIDATES

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

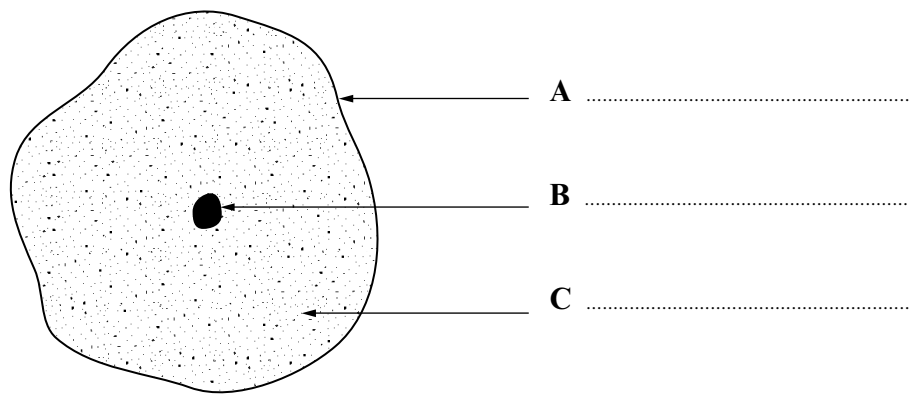
You are reminded of the necessity for good English and orderly presentation in your answers.

Answer **all** questions.

1. (a) Some structures found in living cells are listed below.

- | | |
|---------------|-----------|
| cell membrane | nucleus |
| cytoplasm | vacuole |
| chloroplast | cell wall |

(i) From the list above, label **A**, **B** and **C** on the diagram of an animal cell below [3]



(ii) From the list, name **two** structures which are found *only* in *plant* cells. [2]

.....

(b) (i) Complete the sentence using one of the words below. [1]

- skin nerve stem

During animal growth, cells develop into various types of cells.

(ii) Underline the correct statement below. [1]

Plants grow to a definite size but animals grow throughout life.

Plants grow throughout life but animals grow to a definite size.

Plants and animals grow to a definite size.

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2. Read the following information.

The Blue Footed Booby



- The Blue Footed Booby spends most of its life at sea, feeding on fish.
- It needs land near the coast for breeding. It produces very few eggs.
- Over-fishing by humans, sea pollution and tourism are increasing.
- Land near the coast has been used for building.
- Some tourists collect eggs.

Using **the above information only**:

(a) Why could each of the following cause numbers of the birds to decrease?

(i) Building hotels [1]

.....

(ii) Egg collecting [1]

.....

(iii) Sea pollution [1]

.....

(b) Give **one** way in which the fishing industry could help more birds to survive. [1]

.....

(c) Suggest reasons why

(i) some scientists think it is necessary to carry out conservation work to help the Blue Footed Booby; [1]

.....

(ii) some people think it is a good idea to encourage tourism. [1]

.....

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3. The diagram below shows the organisms in a food chain in an area. The energy present at each stage, at a given time, is shown in kilojoules (kJ).



grass snakes 88 kJ



frogs 1 600 kJ



slugs 12 000 kJ



lettuce 80 000 kJ

(a) From the diagram:

(i) Name a carnivore.

[1]

.....

(ii) Name the producer and state its source of energy

[2]

Producer

Source of energy

(b) (i) From the diagram, complete the table to show the energy lost in this food chain.

[1]

Stage in food chain	Energy loss calculation	Energy lost (kJ)
lettuce to slugs	80000 - 12000	68000
slugs to frogs
frogs to snakes	1600 - 88	1512

(ii) During which stage is the most energy lost? Underline the correct answer.

[1]

lettuce to slugs

slugs to frogs

frogs to snakes

(c) State **one** way in which energy is lost from a food chain.

[1]

.....

4. (a) (i) Complete the equation for photosynthesis.

[2]

carbon dioxide + → + oxygen

(ii) What is the function of chlorophyll in photosynthesis?

[1]

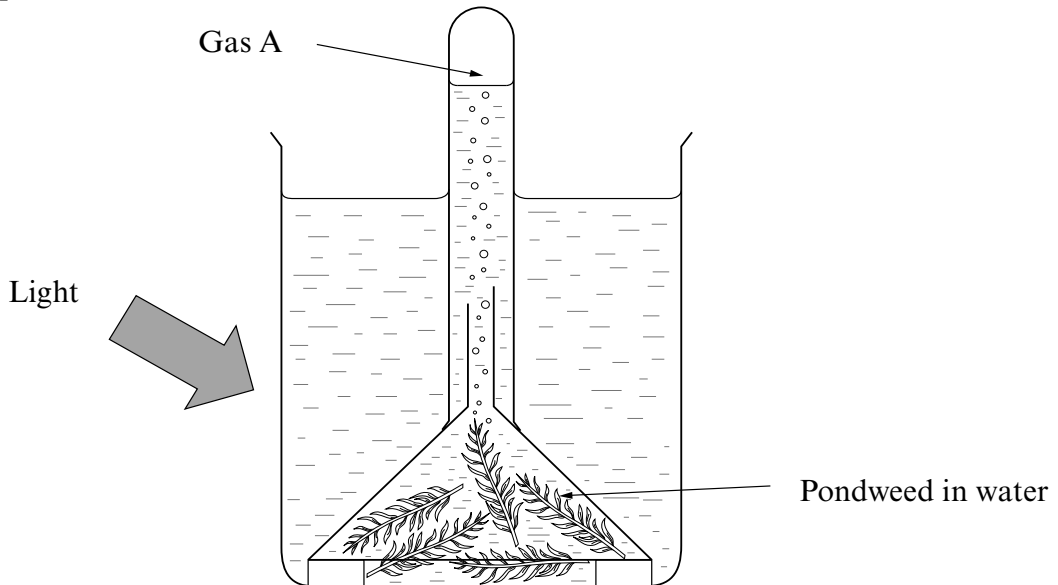
Underline the correct answer.

to absorb carbon dioxide

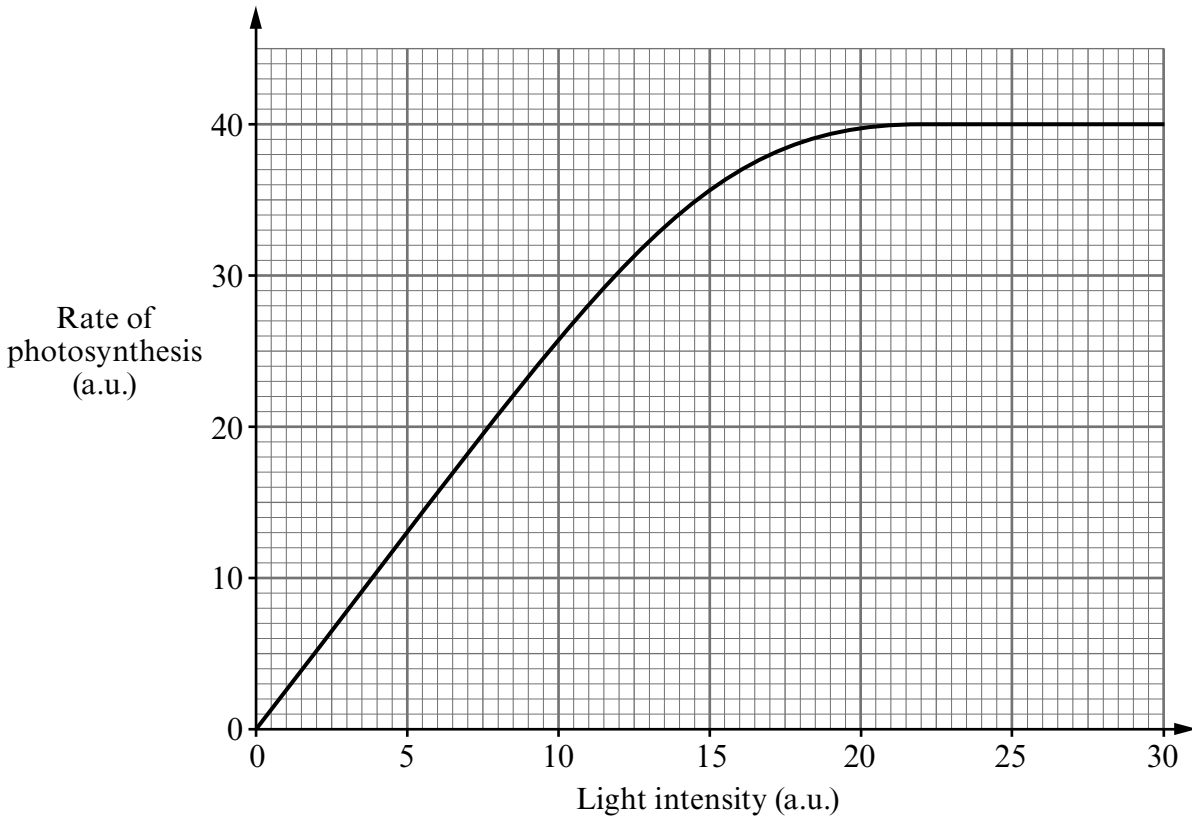
to absorb light

to absorb starch

(b) Students investigated the rate of photosynthesis at different light intensities using the apparatus below.



The graph below shows the results of the investigation



(i) Name gas A shown on the diagram. [1]

.....

(ii) From the graph:

I Describe how the rate of photosynthesis changes as the intensity of light is increased. [1]

.....
.....

II State the rate of photosynthesis at a light intensity of 17 units. [1]

.....
.....

III Calculate the change in the rate of photosynthesis between light intensities of 10 and 17 units. Show your working. [1]

..... (a.u.)

(iii) How would the rate of photosynthesis be affected if the temperature decreased? [1]

.....

5. (a) Complete the sentences using some of the terms below. [3]

protein chemical carbohydrate pH value

Enzymes are made of

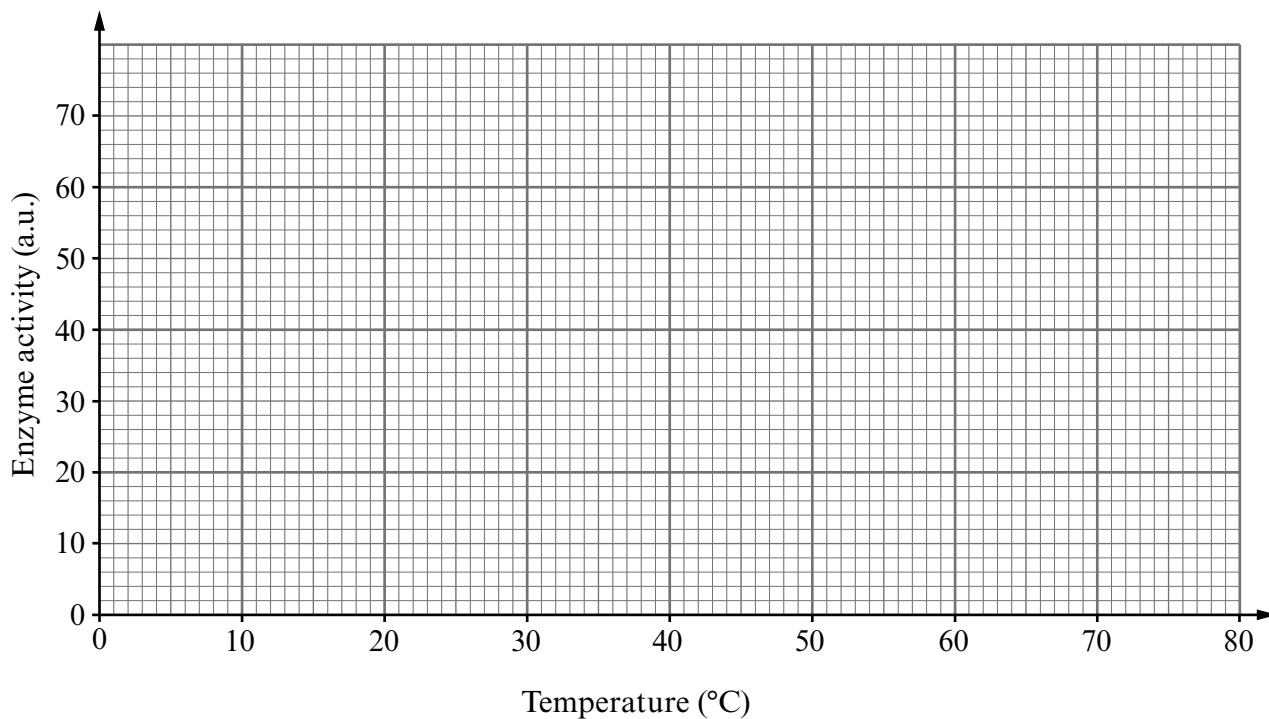
They control reactions in living cells.

Each enzyme works best at a particular temperature and

- (b) Scientists measured the activity of an enzyme at different temperatures. The results are shown below.

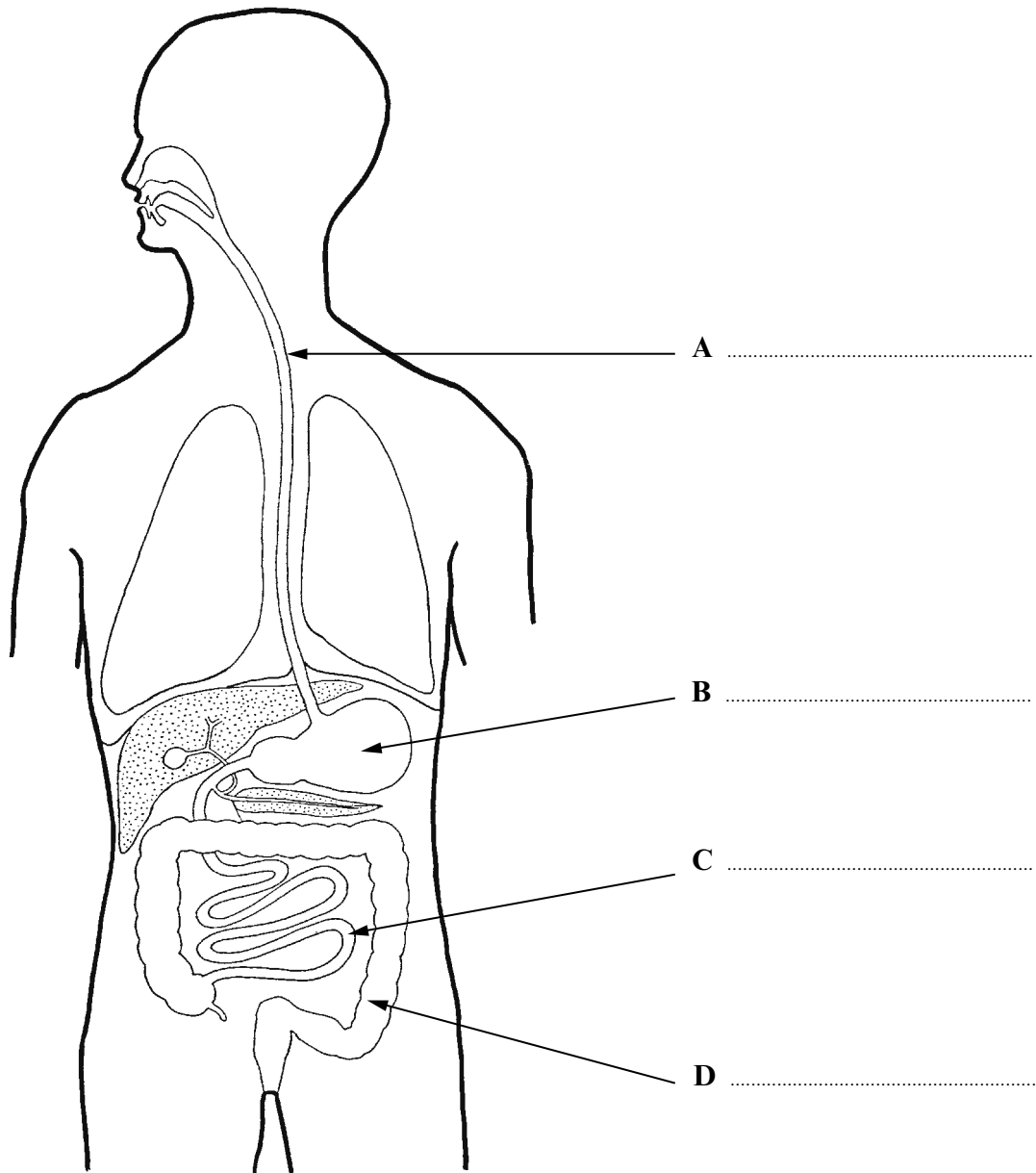
Temperature (°C)	Enzyme activity (a.u.)
10	15
20	34
30	67
40	62
50	46

Plot the results onto the graph below. Join the plots with a ruler. [3]



- (c) On the graph, continue your line to show the result you would expect for 70°C. [1]
- (d) Explain how *boiling* affects the activity of an enzyme. [1]
-

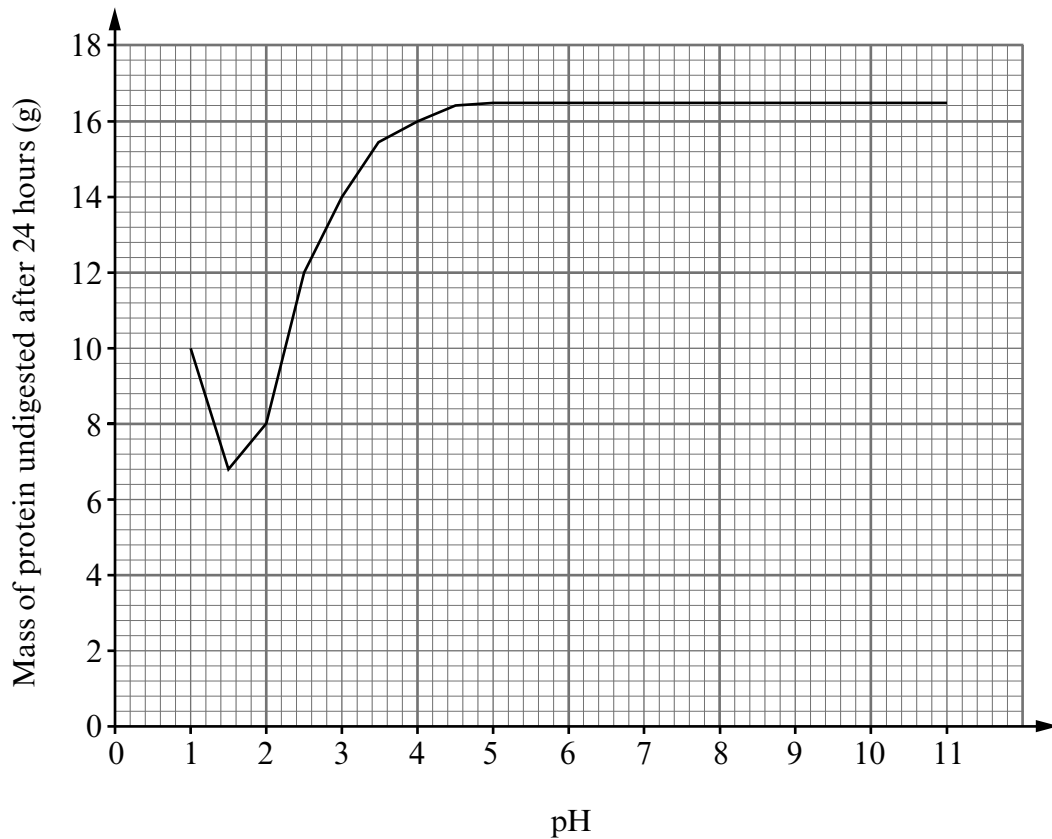
6. The diagram below shows the human digestive system.



(a) Name the parts labelled A – D on the diagram.

[4]

- (b) An investigation was carried out to find the mass of protein digested by a protease enzyme. The mass of protein remaining undigested after 24 hours was recorded. The experiment was repeated at different pH levels. The results are shown in the graph.



- (i) What is the optimum pH of this enzyme? [1]

- (ii) Name the organ where this enzyme can be found in the body. [1]

- (iii) Apart from time, state **one other** feature which should have been kept constant during this investigation. [1]

7. Japanese Knotweed is an alien species in the UK. The UK government spends many millions of pounds every year trying to eradicate the plant.

In Japan a small insect, *Aphalara itadoria*, eats Japanese Knotweed and therefore controls the spread of the plant. This insect has now been imported into the UK from Japan to control Japanese Knotweed. This is the first time that an insect has been licensed for the control of a pest species by the European Union.

Japanese Knotweed



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- (a) What is meant by an alien species? [1]

.....

.....

- (b) What term is used to describe the use of a living organism to control a pest species? [1]

.....

- (c) Japanese Knotweed has caused serious damage to underground drainage, roads and buildings in the UK and Europe for over 50 years. Suggest why it took such a long time to approve the use of *Aphalara itadoria* for the control of Japanese Knotweed in the UK and Europe. [2]

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8. The sparrowhawk feeds on woodpigeons and blue tits. Blue tits eat insects. Each photo includes the concentration of insecticide found in the flesh of each bird in parts per million (ppm) in Britain in 1965.

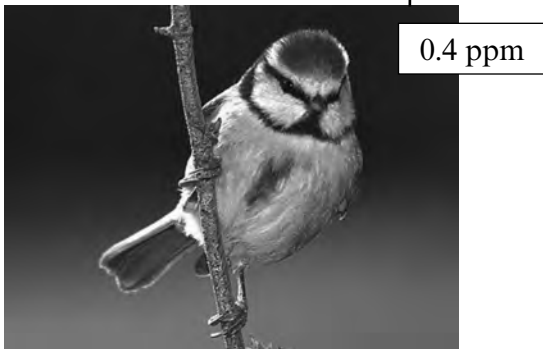
Sparrowhawk



Woodpigeon



Blue tit



Google Images

- (a) The woodpigeon eats only plants. Suggest how it has insecticide in its body. [1]

.....

.....

- (b) The sparrowhawk feeds on woodpigeons and blue tits.

- (i) Why does the sparrowhawk have a higher concentration of insecticide in its body than either the woodpigeon or the blue tit? [2]

.....

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- (ii) Sparrowhawks were often killed by the concentration of insecticide in their bodies but woodpigeons and blue tits were not. Explain the reason for this. [1]

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