Write your name here

Surname	Other names

Pearson Edexcel GCSE

Centre Number | | | | | |

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Biology/Science

Unit B1: Influences on Life

Foundation Tier

Tuesday 12 May 2015 – Afternoon
Time: 1 hour

Paper Reference
5BI1F/01

You must have:
Calculator, ruler

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*

Information

- The total mark for this paper is 60.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed
  – *you should take particular care with your spelling, punctuation and grammar, as well as the clarity of expression, on these questions.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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P 4 4 6 7 2 A 0 1 2 0

PEARSON

Answer ALL questions

Some questions must be answered with a cross in a box ☒.
If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Classification

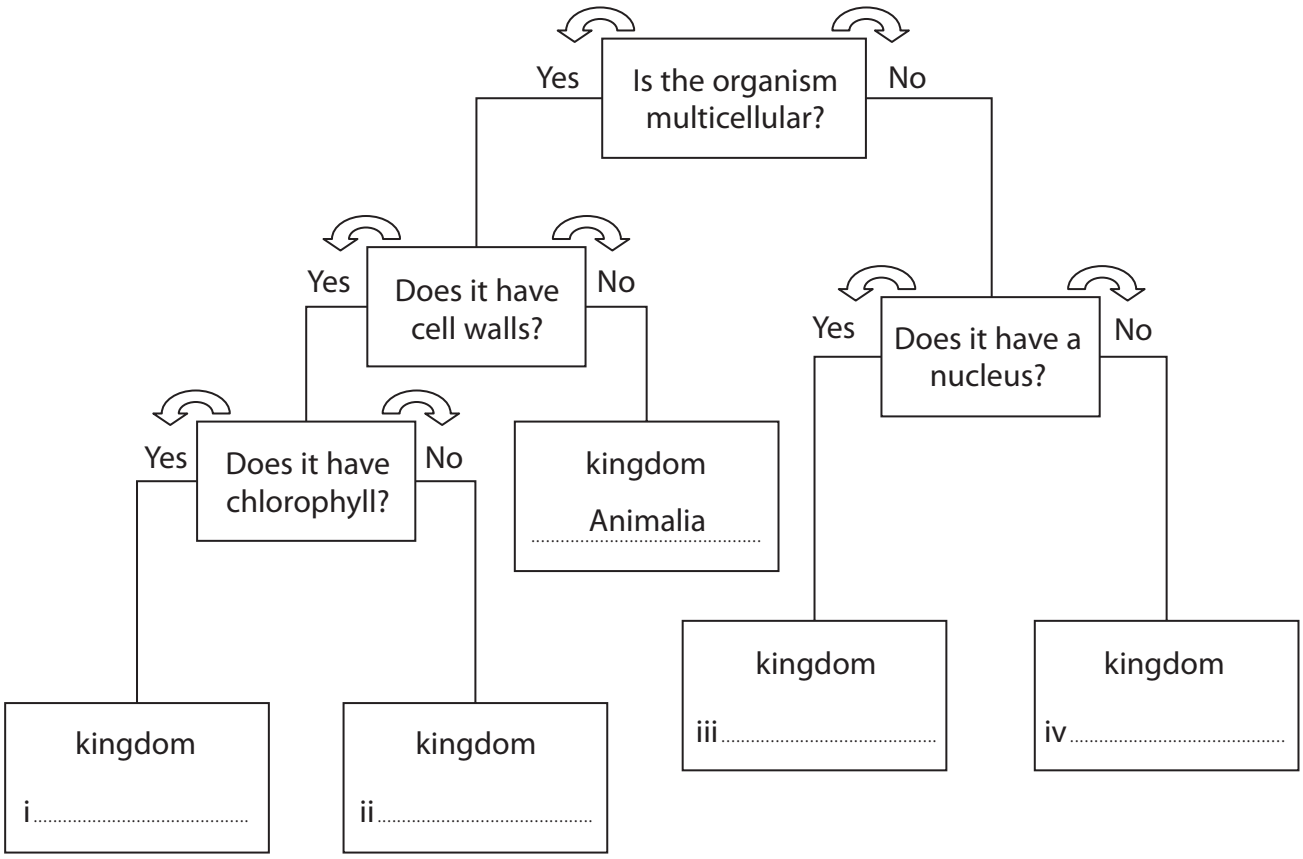
1 (a) John produced a key to classify organisms into their kingdoms.

The names of the kingdoms are shown in the box.

Animalia	Fungi	Plantae
Prokaryotes	Protoctista	

Use words from the box to complete the key. One has been done for you.

(4)



(b) (i) The kingdom Animalia includes vertebrates and invertebrates.

Complete the sentence by putting a cross (☒) in the box next to your answer.

Vertebrates have

(1)

☒ **A** a supporting rod running the length of their body

☒ **B** cells that contain chloroplasts

☒ **C** the ability to feed saprophytically

☒ **D** the ability to feed autotrophically

(ii) There are several groups of vertebrate.

Which group absorbs oxygen using gills?

Put a cross (☒) in the box next to your answer.

(1)

☒ **A** birds

☒ **B** fish

☒ **C** mammals

☒ **D** reptiles

(c) Some organisms can form hybrids.

Explain how a hybrid is formed.

(2)

.....

.....

.....

.....

.....

(Total for Question 1 = 8 marks)

Type 2 diabetes

2 Research shows that overweight people may develop Type 2 diabetes.

(a) Body Mass Index (BMI) can be used to identify people who are overweight.

BMI can be calculated using the equation:

$$\text{BMI} = \frac{\text{mass in kilograms}}{\text{height in metres} \times \text{height in metres}}$$

(i) Calculate the BMI for a person who has a mass of 77 kilograms and a height of 1.6 metres.

(2)

BMI = ...

(ii) Scientific research has shown a link between high BMI and the development of Type 2 diabetes.

Describe how the scientific community would validate this research.

(2)

.....

.....

.....

.....

.....

.....

(b) Blood glucose levels are controlled by hormones.

(i) Use words from the box to complete the following sentences.

(2)

glycogen	liver	insulin
brain	pancreas	auxin

Type 2 diabetes develops when a person becomes resistant to the

hormone .....

This hormone is produced in the .....

(ii) Describe **two** ways a person with Type 2 diabetes can control their blood glucose levels without the use of hormones.

(2)

.....

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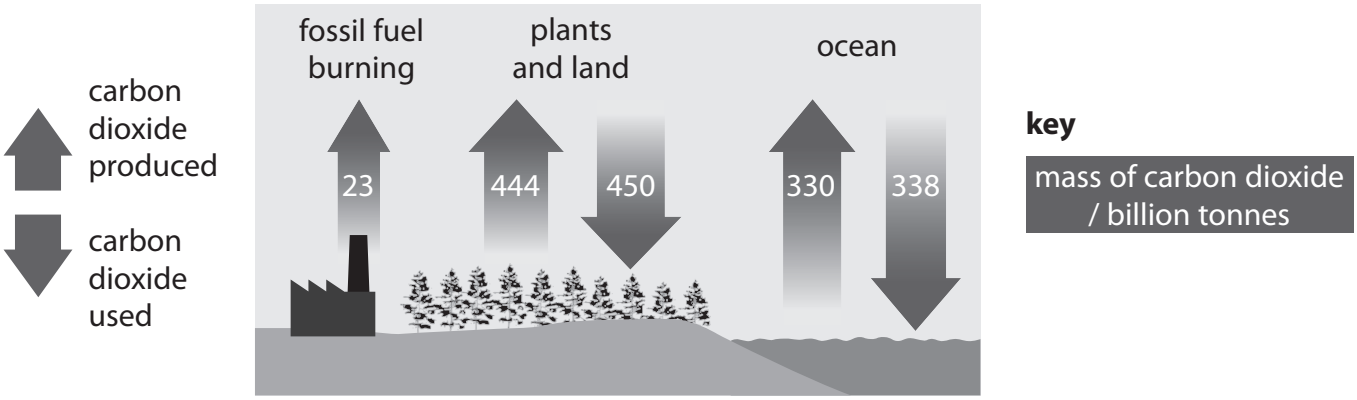
(Total for Question 2 = 8 marks)

The carbon cycle

3 The diagram shows the mass of carbon dioxide used and produced during one year.



(a) (i) Calculate the difference in mass of carbon dioxide used and produced by the plants and land.

(2)

..... billion tonnes of carbon dioxide

(ii) The total mass of carbon dioxide used was 788 billion tonnes.

Calculate the total mass of carbon dioxide produced.

(2)

..... billion tonnes of carbon dioxide

(b) (i) Suggest **one** effect of an increase in the mass of carbon dioxide produced in the atmosphere.

(1)

.....

.....

.....

(ii) Explain why plants remove carbon dioxide from the atmosphere.

(2)

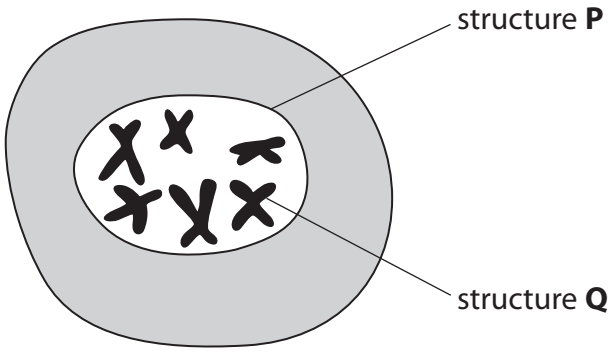
(iii) Suggest **two** ways of reducing the mass of carbon dioxide in the atmosphere.

(2)

(Total for Question 3 = 9 marks)

Genetic inheritance

4 The diagram shows a cell.



(a) (i) Complete the sentence by putting a cross (☒) in the box next to your answer.

Structure **P** is the

(1)

- ☒ **A** chloroplast
- ☒ **B** gene
- ☒ **C** cytoplasm
- ☒ **D** nucleus

(ii) Complete the sentence by putting a cross (☒) in the box next to your answer.

Structure **Q** is a

(1)

- ☒ **A** chromosome
- ☒ **B** cell wall
- ☒ **C** cell membrane
- ☒ **D** phenotype

(iii) A gene can exist in alternative forms.

State the genetic term used for an alternative form of the same gene.

(1)

.....

(b) Cystic fibrosis is a recessive genetic disorder.

Two parents, Paul and Sue, each have the same genotype **Ff** for cystic fibrosis.

(i) Complete the Punnett square to show the possible genotypes of the offspring of Paul and Sue.

(1)

		Paul	
		F	f
Sue	F		
	f		

(ii) State the probability that Paul and Sue will have a child with cystic fibrosis.

(1)

.....

(c) Explain why a person can be underweight due to cystic fibrosis.

(2)

.....

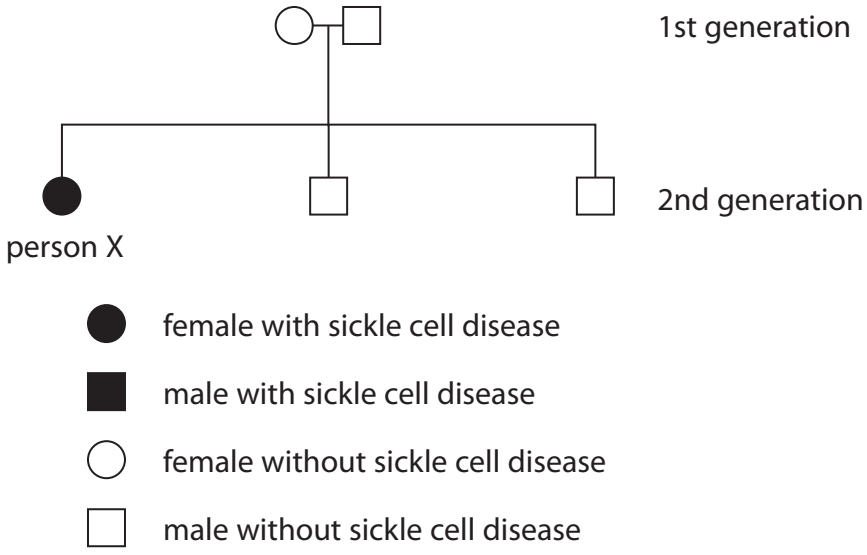
.....

.....

.....

(d) Sickle cell disease is another recessive genetic disorder.

The pedigree chart shows the inheritance of sickle cell disease in two generations of a family.



(i) Explain why person X inherited sickle cell disease.

(2)

(ii) Explain why a person with sickle cell disease may have difficulty exercising.

(2)

(Total for Question 4 = 11 marks)

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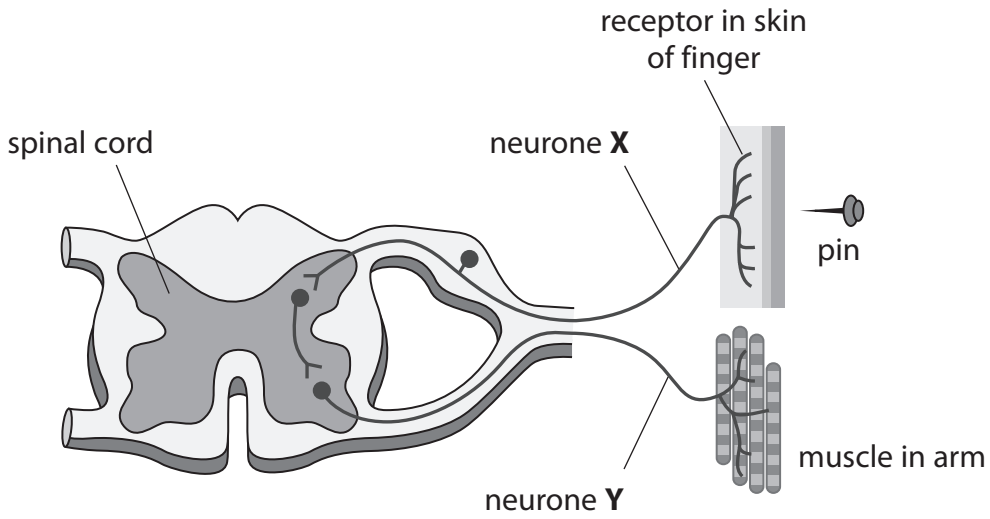
The nervous system

5 The diagram shows a reflex arc in the human body.



(a) (i) Complete the sentence by putting a cross (☒) in the box next to your answer.

Neurone **X** carries an impulse from the skin to the spinal cord.

Neurone **X** is a

(1)

☒ **A** motor neurone

☒ **B** reflex neurone

☒ **C** sensory neurone

☒ **D** relay neurone

(ii) Complete the sentence by putting a cross (☒) in the box next to your answer.

Neurone **Y** carries a message from the spinal cord to the muscle.

Neurone **Y** is a

(1)

☒ **A** motor neurone

☒ **B** reflex neurone

☒ **C** sensory neurone

☒ **D** relay neurone

(iii) Explain the advantage of the reflex action that will occur when the pin pierces the skin of the finger.

(2)

.....

.....

.....

.....

(b) Describe how the brain is linked to the skin of the finger in this reflex arc.

(2)

.....

.....

.....

.....

*(c) Alcohol and caffeine affect the time the body takes to react to a stimulus.

Describe how alcohol and caffeine have different effects on reaction times.

(6)

(Total for Question 5 = 12 marks)

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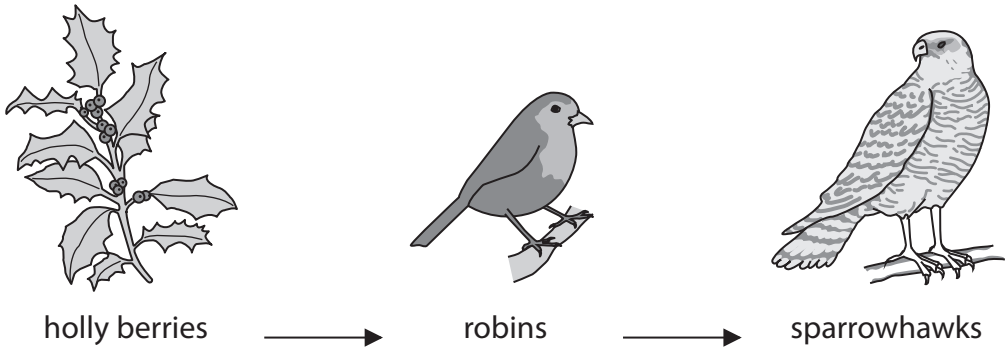
Energy

6 The diagram shows a woodland food chain.



The table shows the number and biomass of each part of the food chain.

part of food chain	number	biomass / g
holly berries	10000	5000
robins	25	1500
sparrowhawks	2	800

(a) (i) Draw a pyramid of biomass for this food chain in the box.

(1)

(ii) Calculate the difference in biomass between the robins and the sparrowhawks.

(2)

..... g

(iii) Biomass decreases at each trophic level in this food chain.

Use words from the box to complete the following sentences.

(3)

respiration	photosynthesis	longer
phototropism	excretion	limited

During ....., the holly tree leaves use light energy to make glucose.

The robins release energy from the glucose during the process of .....

The length of the food chain is ..... because energy is lost at each trophic level.

*(b) Fleas are parasites.

A parasite is an organism that depends on a host species to survive.

Describe, using **two** other examples, how parasites depend on host species to survive.

(6)

(Total for Question 6 = 12 marks)

TOTAL FOR PAPER = 60 MARKS

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