

Write your name here

Surname

Other names

Centre Number

Candidate Number

**Edexcel GCSE**

**Biology/Science**

**Unit B1: Influences on Life**

**Foundation Tier**

Tuesday 15 May 2012 – Morning

**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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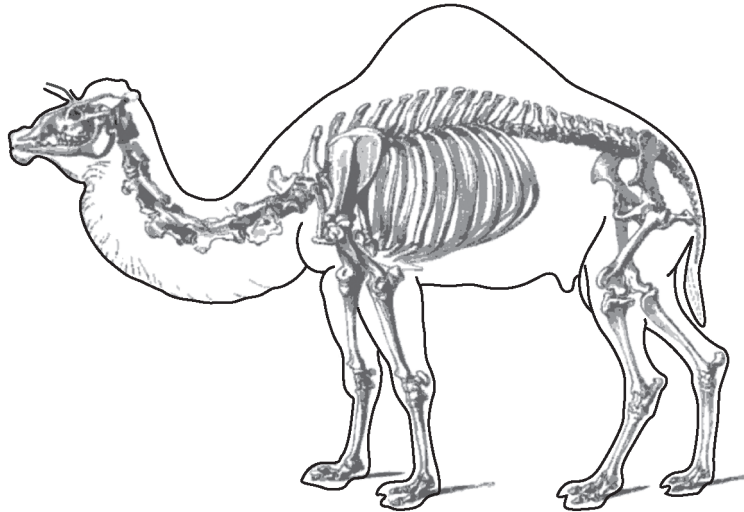
**Answer ALL questions.**

**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) Camels belong to the phylum Chordata.

The drawing shows a dromedary camel that has the binomial name *Camelus dromedaries*.



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

The second part of the binomial name, *dromedaries*, refers to the

(1)

- A** class
- B** genus
- C** order
- D** species

(ii) State **one** feature that all members of the phylum Chordata have in common.

(1)

.....

.....



(iii) Members of the phylum Chordata can be further classified by how they regulate their body temperature.

Reptiles are poikilothermic and mammals are homeothermic.  
Explain how reptiles and mammals regulate their body temperature.

(2)

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(b) Scientists classify organisms into five different kingdoms.

Draw **one** straight line from each description to its correct kingdom.

(2)

**description**

**kingdom**

unicellular with  
nucleus present

Animalia

Plantae

Fungi

Protoctista

multicellular and  
photosynthetic

Prokaryotes



(c) Viruses are not classified into any of the five kingdoms.

Suggest reasons for this.

(2)

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**(Total for Question 1 = 8 marks)**



### Reaction times

- 2 (a) The reaction times of some athletes were measured at the Beijing Olympics in the final of the 100 metres sprint.

athlete	reaction time / s	overall race time / s
Bolt: Usain	0.165	9.69
Burns: Marc	0.145	10.01
Dix: Walter	0.133	9.91
Frater: Michael	0.147	9.97
Martina: Churandy	0.169	9.93
Patton: Darvis	0.142	10.03
Powell: Asafa	0.134	9.95
Thompson: Richard	0.133	9.89

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

The athlete with the slowest reaction time is

(1)

- A** Bolt: Usain
- B** Martina: Churandy
- C** Patton: Darvis
- D** Thompson: Richard

- (ii) Name the athlete who finished the 100 metres sprint in the fastest time.

(1)



(iii) Calculate the difference between the overall race time of the fastest athlete and slowest athlete.

(2)

answer = ..... s

(b) The athlete starts to run when a gun is fired.

(i) State the athlete's sense organ that detects this stimulus.

(1)

(ii) Describe the nerve pathway a nerve impulse will take from where it is received to where it will cause a response to take place.

(3)

**(Total for Question 2 = 8 marks)**



### Mistletoe plants

- 3 The photograph shows a mistletoe plant growing on a tree. The mistletoe plant uses nutrients from the tree. This can cause the tree to die.



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

The relationship between the mistletoe plant and the tree is an example of (1)

- A mutualism
- B parasitism
- C phototropism
- D symbiosis

- (ii) The mistletoe plant also gains energy from sunlight to produce glucose.

State the name of this process. (1)

- (b) The mistletoe plant produces fruit that contains seeds. The Mistle Thrush is a bird that spreads these mistletoe seeds to other trees.

- (i) Suggest how the Mistle Thrush spreads the mistletoe seeds to other trees. (2)

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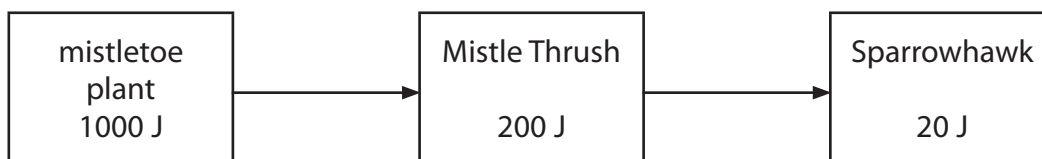
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(ii) Sparrowhawks are birds that are predators of the Mistle Thrush.

The diagram shows the energy values in the food chain for these organisms.



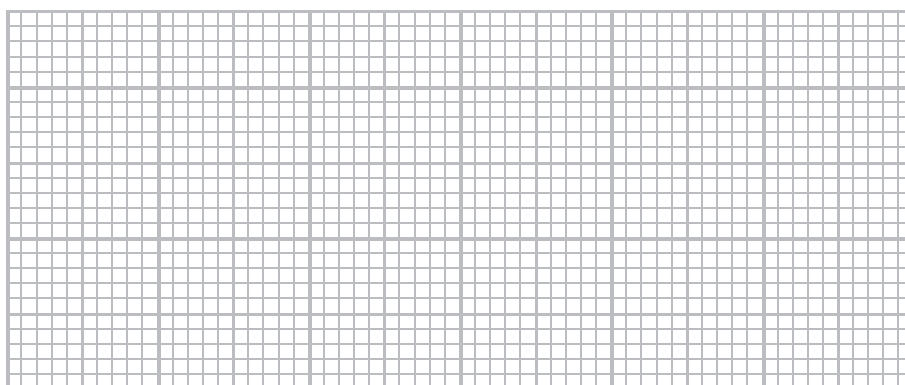
Calculate the percentage of energy that was passed from the mistletoe plant to the Mistle Thrush.

(2)

answer = ..... %

(iii) Draw a pyramid of energy for this food chain.

(2)



(iv) Suggest **two** ways in that energy is lost from this food chain.

(2)

1 .....

.....

2 .....

.....

**(Total for Question 3 = 10 marks)**



## Homeostasis

- 4 If a person is to survive, the internal environment of their body must be controlled.
- (a) The volume of water in the blood can be controlled.

This is called osmoregulation.

The table shows the volume of urine produced by six different people on a hot day and on a cold day.

person	volume of urine produced / cm <sup>3</sup>	
	hot day	cold day
1	430	890
2	350	1060
3	270	930
4	560	1280
5	400	680
6	390	1160
mean		1000

- (i) Calculate the mean volume of urine produced on the hot day.

(1)

answer = ..... cm<sup>3</sup>

- (ii) State the difference between the mean volume of urine produced on the hot day and the mean volume of urine produced on the cold day.

(1)

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(iii) Explain why, on a hot day, less water is lost from the body as urine.

(2)

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(b) The glucose content of human blood also needs to be controlled.

After a meal, high in carbohydrates, the glucose content of the blood will rise.

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

The hormone that lowers the glucose content of the blood is

(1)

- A** auxin
- B** glycogen
- C** insulin
- D** pancreas

(ii) Explain how the glucose content of the blood can be decreased by this hormone.

(2)

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(iii) People with Type 1 diabetes cannot produce the hormone needed to control the glucose content of the blood.

Explain how a Type 1 diabetic can control the glucose content of the blood.

(3)

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**(Total for Question 4 = 10 marks)**



## Sickle cell disease

5 (a) The diagram shows a chromosome.



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

(2)

alleles

DNA

gene

phenotype

genotypes

Chromosomes have sections which code for specific characteristics.

Each characteristic is coded for by a ..... . These exist in alternative forms called .....

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

In a human body cell, chromosomes are found in the

(1)

- A cell membrane
- B cytoplasm
- C DNA
- D nucleus



(b) Sickle cell disease is a genetic disorder that affects human red blood cells. Individuals with sickle cell disease have the genotype **dd**.

(i) Draw **one** straight line from the genotype to the correct description.

(1)

**genotype**

**description**

**dd**

homozygous  
recessive

homozygous  
dominant

heterozygous

carrier

(ii) Describe the symptoms of sickle cell disease.

(2)

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\*(iii) A father with the genotype **DD** and a mother with the genotype **dd** for sickle cell disease had a number of children.

Explain why none of their children will have sickle cell disease.  
Use a Punnett square or genetic diagram to help your explanation.

(6)

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**(Total for Question 5 = 12 marks)**

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## Pollution

6 (a) As the human population increases, more fossil fuels are burned.  
The burning of coal is one of the main contributors to acid rain.

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

The gas produced when coal burns that can lead to acid rain formation is (1)

- A carbon monoxide
- B methane
- C oxygen
- D sulfur dioxide

(ii) Describe how acid rain is formed. (2)

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(iii) Suggest **one** effect acid rain has on the environment. (1)

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(b) Explain how the quality of a river can be monitored by studying the organisms present in the water. (2)

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