Paper Reference(s) 5BI1F/01

Edexcel GCSE

Biology/Science
Unit B1: Influences on Life
Foundation Tier

Tuesday 15 May 2012 – Morning
Time: 1 hour plus your additional time allowance

INSTRUCTIONS TO CANDIDATES
Write your centre number, candidate number, surname, initials and your signature in the boxes below. Check that you have the correct question paper.

Centre No.								
Candidate No.								
Surname								
Initial(s)								
Signature								
Paper Reference	5	B	I	1	F	/	0	1

Q40238A

PEARSON

- Use BLACK ink or ball-point pen.
- Answer ALL questions.
- Answer the questions in the spaces provided – there may be more space than you need.

MATERIALS REQUIRED FOR EXAMINATION

Calculator, ruler

ITEMS INCLUDED WITH QUESTION PAPERS

Nil

INFORMATION FOR CANDIDATES

- 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 TO CANDIDATES

- 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.

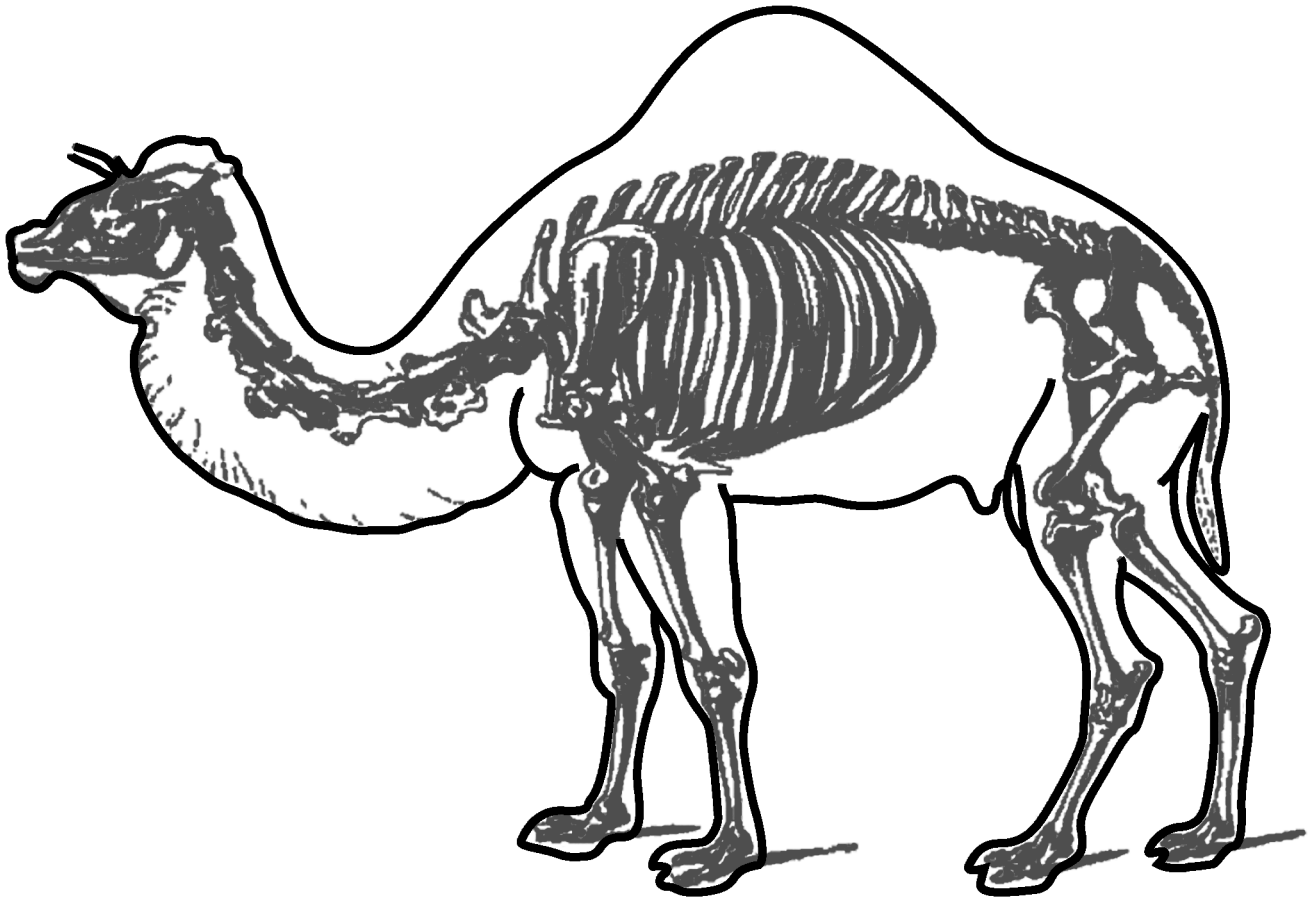
Answer ALL questions.

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.



(Question continues on next page)

(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 mark)

☐ A class

☐ B genus

☐ C order

☐ D species

(ii) State ONE feature that all members of the phylum Chordata have in common. (1 mark)

_____

_____

_____

(Question continues on next page)

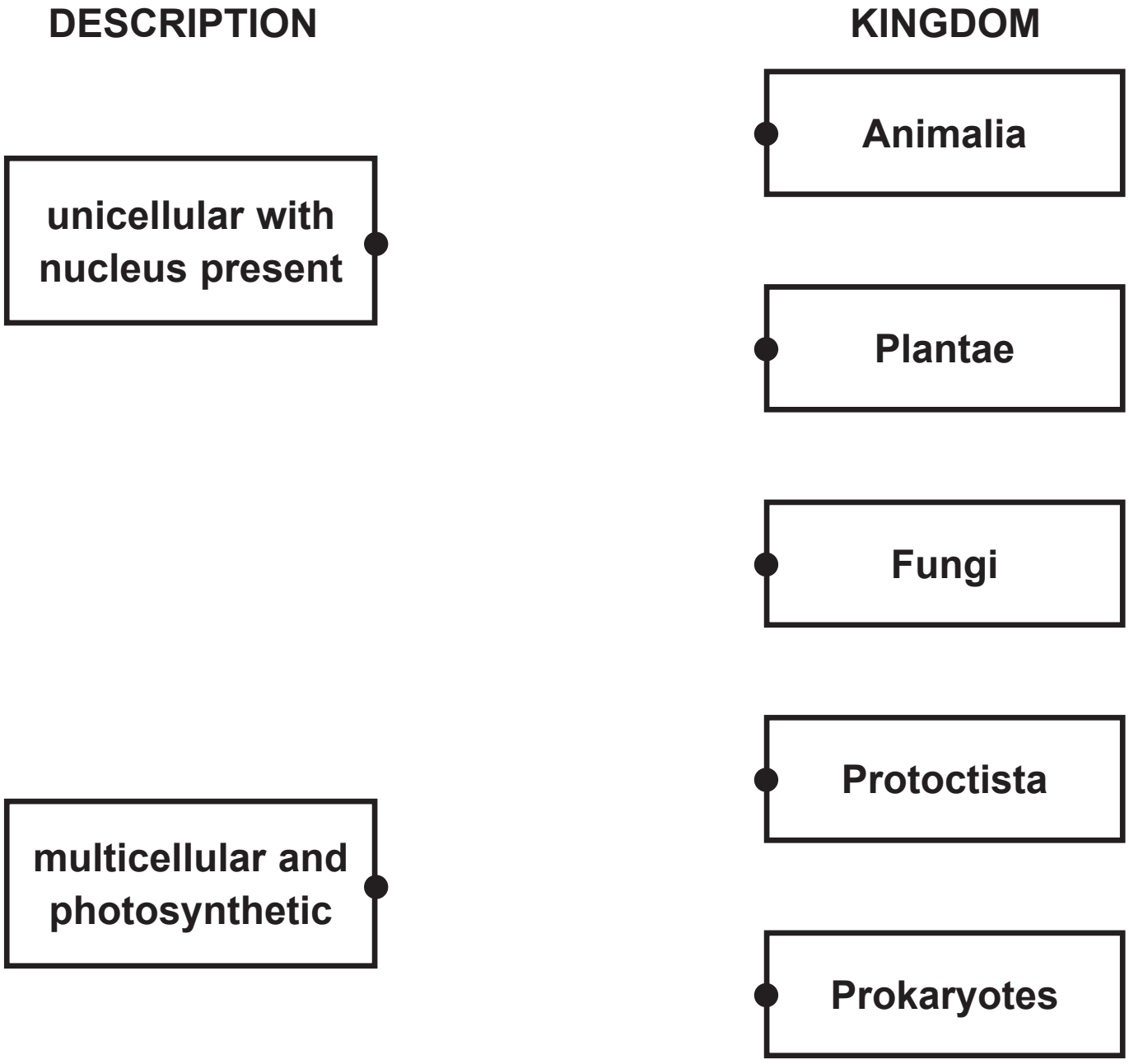
(iii) **Members of the phylum Chordata can be further classified by how they regulate their body temperature.**

Reptiles are poikilothermic and mammals are homeothermic.
Explain how reptiles and mammals regulate their body temperature. (2 marks)

(Question continues on next page)

(b) Scientists classify organisms into five different kingdoms.

Draw ONE straight line from each description to its correct kingdom. (2 marks)



(Question continues on next page)

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

Suggest reasons for this. (2 marks)

Q1

(Total 8 marks)

(Questions continue on next page)

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 mark)

☐ A Bolt: Usain

☐ B Martina: Churandy

☐ C Patton: Darvis

☐ D Thompson: Richard

(Question continues on next page) (Turn over)

(ii) Name the athlete who finished the 100 metres sprint in the fastest time. (1 mark)

(iii) Calculate the difference between the overall race time of the fastest athlete and slowest athlete. (2 marks)

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 mark)

(Question continues on next page)

(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 marks)**

Q2

(Total 8 marks)

(Questions continue on next page)

MISTLETOE PLANTS

3 Mistletoe is a plant which grows on the branches of trees and 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 mark)

☐ **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 mark)

(Question continues on next page)

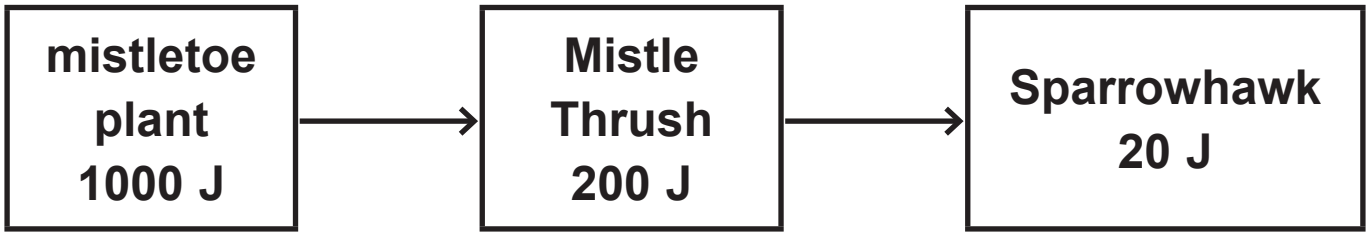
(b) The mistletoe plant produces fruit that contains seeds.
The Mistle Thrush is a bird that spreads these mistletoe seeds to other trees.

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

(Question continues on next page)

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

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

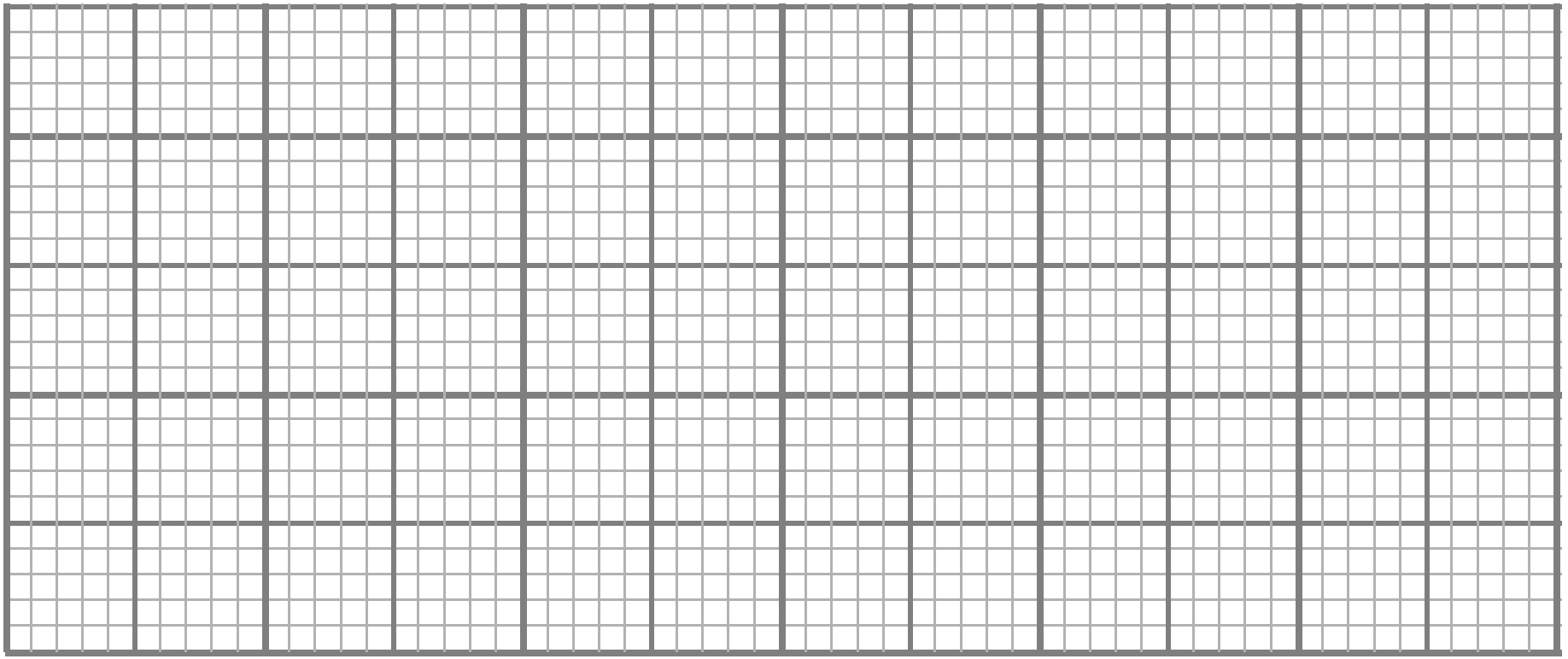


Calculate the percentage of energy that was passed from the mistletoe plant to the Mistle Thrush. (2 marks)

answer = _____ %

(Question continues on next page)

(iii) Draw a pyramid of energy for this food chain. (2 marks)



(Question continues on next page)

(Turn over)

(iv) Suggest TWO ways in that energy is lost from this food chain. (2 marks)

1 _____

_____

_____

2 _____

_____

_____

Q3

(Total 10 marks)

(Questions continue on next page)

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^3	
	HOT DAY	COLD DAY
1	430	890
2	350	1060
3	270	930
4	560	1280
5	400	680
6	390	1160
mean		1000

(Question continues on next page)

(i) Calculate the mean volume of urine produced on the hot day. (1 mark)

answer = _____ cm^3

(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 mark)

_____

_____

_____

(Question continues on next page)

(iii) Explain why, on a hot day, less water is lost from the body as urine. (2 marks)

(Question continues on next page)

(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 mark)

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

(Question continues on next page)

(ii) Explain how the glucose content of the blood can be decreased by this hormone. (2 marks)

(Question continues on next page)

(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 marks)

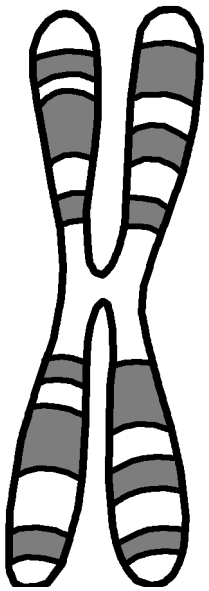
Q4

(Total 10 marks)

(Questions continue on next page)

SICKLE CELL DISEASE

5 (a) The diagram shows a chromosome.



(i) Use words from the box to complete the sentences. (2 marks)

alleles		DNA
	gene	
phenotype		genotypes

Chromosomes have sections which code for specific characteristics. Each characteristic is coded for by

_____ .

These exist in alternative forms called

_____ .

(Question continues on next page)

(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 mark)

☐ A cell membrane

☐ B cytoplasm

☐ C DNA

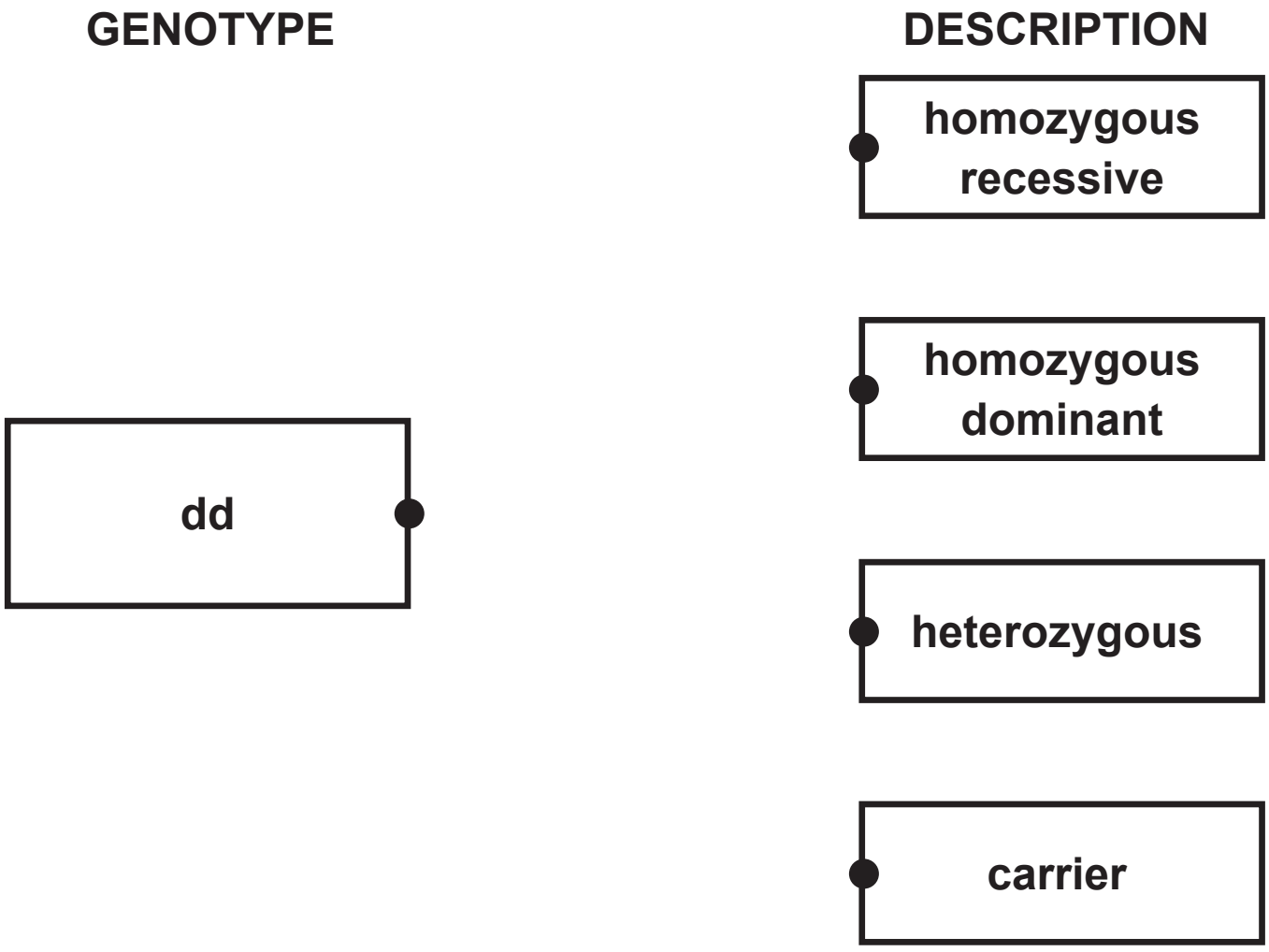
☐ D nucleus

(Question continues on next page)

(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 mark)



(Question continues on next page)

(ii) Describe the symptoms of sickle cell disease. (2 marks)

(Question continues on next page)

*(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 marks)

(Continue your answer on next page) (Turn over)

Q5

(Total 12 marks)

(Questions continue on next page)

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 mark)

☐ **A carbon monoxide**

☐ **B methane**

☐ **C oxygen**

☐ **D sulfur dioxide**

(Question continues on next page)

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

(iii) Suggest ONE effect acid rain has on the environment. (1 mark)

(Question continues on next page)

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

(Question continues on next page)

*(c) Eutrophication can cause problems in an aquatic environment such as a lake.

Explain how eutrophication occurs and the problems it can cause in an aquatic environment. (6 marks)

(Continue your answer on next page)

Q6

(Total 12 marks)

TOTAL FOR PAPER = 60 MARKS

END