

Centre Number						Candidate Number				
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Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
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8	
9	
TOTAL	



General Certificate of Secondary Education
Foundation Tier
June 2011

Science B
Unit Biology B1

BLY1F

F

Biology
Unit Biology B1

Written Paper

Tuesday 7 June 2011 1.30 pm to 2.15 pm

For this paper you must have:

- a ruler.
- You may use a calculator.

Time allowed

- 45 minutes

Instructions

- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 45.
- You are expected to use a calculator where appropriate.
- You are reminded of the need for good English and clear presentation in your answers.

Advice

- In all calculations, show clearly how you work out your answer.



J U N 1 1 B L Y 1 F 0 1

Answer **all** questions in the spaces provided.

1 The photographs show some ways in which humans affect the environment.

1 (a) Coal-burning power stations give off smoke. The smoke contains many different gases.



Draw a ring around the correct answer to complete each sentence.

1 (a) (i) The gas which causes global warming is

carbon dioxide.

oxygen.

sulfur dioxide.

(1 mark)

1 (a) (ii) The gas which causes acid rain is

methane.

oxygen.

sulfur dioxide.

(1 mark)

1 (b) The photograph shows a quarry.



Draw a ring around the correct answer to complete each sentence.

1 (b) (i) Quarrying

releases methane into the atmosphere.

increases biodiversity.

reduces land available for animals and plants.

(1 mark)

1 (b) (ii) Quarrying can be reduced by recycling

metals.

paper.

plastic

(1 mark)

1 (c) The photograph shows a farmer spraying fruit trees.



Chemicals in the spray kill insects on the trees.

Draw a ring around the correct answer to complete each sentence.

1 (c) (i) The spray contains

fertiliser.

herbicide.

pesticide.

(1 mark)

1 (c) (ii) The chemical in the spray might also

kill other animals.

kill plants.

increase biodiversity.

(1 mark)

6

Turn over ►

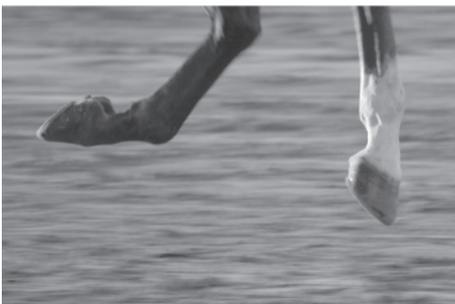


2 An animal's feet are adapted to the animal's way of life.

The photographs show the feet of four different animals.

Draw a line from each photograph of feet to the correct adaptation.

Photograph



Adaptation

Running very fast

Swimming

Flying

Catching and holding prey

Supporting a very heavy body

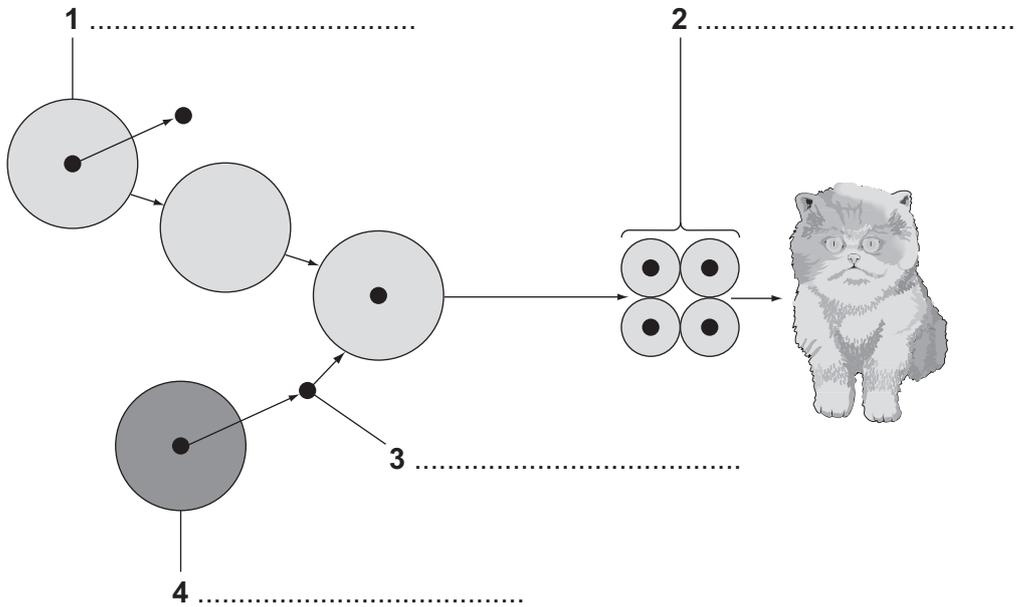
(4 marks)

4



3 It is possible to clone pets.

The diagram shows one way of cloning a pet cat, using the nucleus from a cat skin cell.



embryo	egg	nucleus	skin cell	sperm
--------	-----	---------	-----------	-------

3 (a) Use words from the box to label structures 1, 2, 3 and 4 on the diagram.

(4 marks)

3 (b) The cloning of humans is not allowed.

Tick (✓) **one** box to complete the sentence.

One **ethical** reason for banning the cloning of humans is that . . .

the method used in animal cloning has not been evaluated.

the method is very expensive.

the child created by cloning would not have been able to give permission.

(1 mark)

5

Turn over ▶



- 4 The photograph shows a new-born baby.



- 4 (a) New-born babies have reflex actions. The reflex actions help new-born babies to survive.

Draw a line from each reflex action to the way in which it helps the baby to survive.

Reflex action

How the reflex action helps the baby

If milk goes down the baby's windpipe the baby coughs.

Helps the baby to hold on to the mother

If the mother touches the palm of the baby's hand, the baby clenches its fist.

Prevents the baby from choking

If the mother strokes the baby's mouth, the baby begins to suck.

Helps to protect some of the baby's receptors

If a bright light shines on the baby, the baby's eyes shut.

Helps the baby to crawl

Helps the baby to feed

(4 marks)



4 (b) Which **two** of the following may be effectors in reflex actions?

Tick (✓) **two** boxes.

Brain

Glands

Motor neurones

Muscles

Sensory neurones

(2 marks)

6

Turn over for the next question

Turn over ►



5 Caffeine is a *recreational* drug found in drinks such as coffee and cola.

5 (a) What is meant by a *recreational drug*?

.....
.....

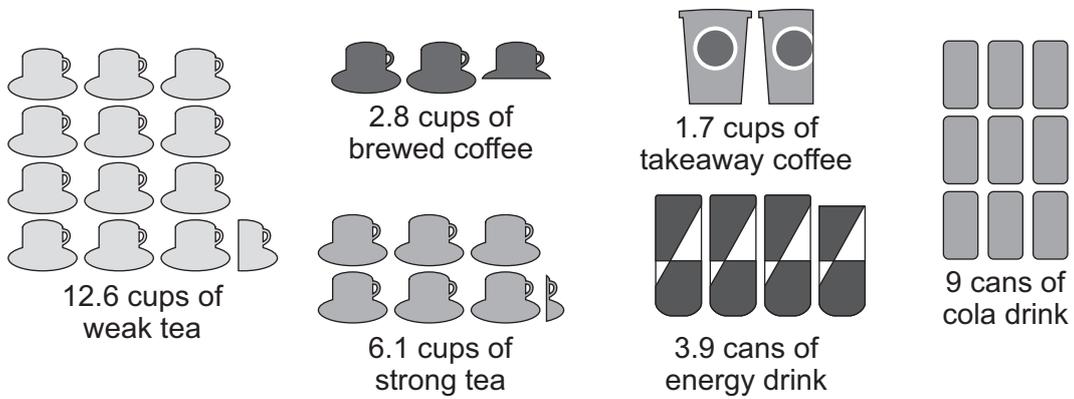
(1 mark)

5 (b) Scientists investigated the effect on the brain of drinking large amounts of caffeine.

They chose students whose drinks contained caffeine equal to at least seven cups of instant coffee each day.

The diagram compares the amount of caffeine in different drinks.

Seven cups of instant coffee a day equals:



5 (b) (i) Seven cups of instant coffee contain 315 mg of caffeine.

How much caffeine is there in **one** cup of instant coffee?

.....

Amount of caffeine mg
(1 mark)



5 (b) (ii) Which drink in the diagram contains the highest amount of caffeine?

Tick (✓) **one** box.

A cup of weak tea

A cup of takeaway coffee

A can of cola

(1 mark)

5 (c) Caffeine may cause hallucinations.

One example of a hallucination is hearing voices that are not there.

The scientists found that students who drank more than seven cups of instant coffee per day were three times more likely to have hallucinations than students who drank one cup or less.

Which is the best conclusion?

Tick (✓) **one** box.

Drinking caffeine causes hallucinations.

It is dangerous to drink caffeine.

There is a link between drinking caffeine and hallucinations.

(1 mark)

4

Turn over for the next question

Turn over ►



6 Hormones control the menstrual cycle.

6 (a) Name **two** of the hormones involved in the menstrual cycle.

1

2

(2 marks)

6 (b) Hormones are used in some types of contraception.

Complete the sentence.

When used as contraceptives, hormones stop becoming mature.
(1 mark)

6 (c) There are several ways of using hormones as contraceptives.

These include:

- taking a contraceptive pill each day for 21 days of the menstrual cycle
- using a contraceptive implant.

The contraceptive implant is put under the skin of a woman's arm.

The implant releases contraceptive hormones for three years before the implant needs to be replaced.

6 (c) (i) Suggest **one** advantage of using this implant rather than taking contraceptive pills.

.....
.....

(1 mark)

6 (c) (ii) Suggest **one** disadvantage of using this implant rather than taking contraceptive pills.

.....
.....

(1 mark)

5



7 Soay sheep live wild on an island off the north coast of Scotland. No people live on the island.



Over the last 25 years, the average height and mass of the wild Soay sheep have decreased.

The scientists think that climate change might have affected the size of the sheep.

7 (a) More Soay sheep are now able to survive winter than 25 years ago.

What change in the climate may have helped more Soay sheep to survive winters?

.....
.....

(1 mark)

7 (b) Complete the sentences.

7 (b) (i) Soay sheep show variation in size because of differences in their

.....

(1 mark)

7 (b) (ii) The change in the size of the Soay sheep over 25 years can be explained by Darwin's theory of

(1 mark)

3

Turn over ►



- 8** Scientists have trialled a new statin called rosuvastatin.
- 17 802 people took part in the trial.
 - All of these people had high levels of a protein called CRP in their blood.
 - The higher the level of CRP in the blood, the higher the risk of a heart attack.
 - None of these people had heart conditions at the beginning of the investigation.
 - None of these people had high LDL (low density lipoprotein) levels.
 - All of these people were aged 50 or above.
 - Half the people were given a rosuvastatin tablet each day; the other half were given a placebo.
 - The trial was stopped 7 months early when it was found that the people given rosuvastatin were 54% less likely to have a heart attack than people given the placebo.

8 (a) Give **two** control variables in this investigation.

1

2 *(2 marks)*

8 (b) What would the placebo be in this investigation?

.....

..... *(1 mark)*

8 (c) The trial gave reliable results.

Give **one** reason why.

.....

..... *(1 mark)*

8 (d) The trial was stopped 7 months early.

Give **one** reason why.

.....

..... *(1 mark)*



- 8 (e)** The manufacturers of rosuvastatin paid for the trial.
However, the manufacturers took no part in the trial.
Suggest **one** reason why the manufacturers did not take part in the trial.

.....
.....

(1 mark)

- 8 (f)** The table shows some of the results of the trial.

Substance	Concentration in blood in mg per 100 cm ³ after 3 years of trial	
	People given rosuvastatin	People given placebo
LDL cholesterol	53	106
HDL cholesterol	50	49
Saturated fats	106	123

Rosuvastatin reduces the risk of heart attacks.

Use the data in the table to explain why.

.....
.....
.....
.....

(2 marks)

8

Turn over for the next question

Turn over ►



9 The body's immune system protects us from diseases.

Describe the different ways in which white blood cells protect us from infectious diseases.

.....

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.....

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(4 marks)

4

END OF QUESTIONS



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Question 5(b) Data source: *Personality and Individual Differences* Volume 46 pages 562–564, *Caffeine, stress, and proneness to psychosis-like experiences: A preliminary investigation*, Simon R. Jones, and Charles Fernyhough, Durham University, 2009
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