Surname

Other Names

Candidate Signature

AQA

General Certificate of Secondary Education
Foundation Tier
January 2013

Science A
Unit Biology B1

Biology
Unit Biology B1

BL1FP

F

Wednesday 9 January 2013   9.00 am to 10.00 am

For this paper you must have:
● a ruler.
You may use a calculator.

Time allowed
● 1 hour

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 60.
● You are expected to use a calculator where appropriate.
● You are reminded of the need for good English and clear presentation in your answers.
● Question 9(a) should be answered in continuous prose.
  In this question you will be marked on your ability to:
  – use good English
  – organise information clearly
  – use specialist vocabulary where appropriate.

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

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

1 The picture shows a basilisk lizard. Some of the adaptations of the lizard are labelled.

Brown skin

Long tail

Webbed toes
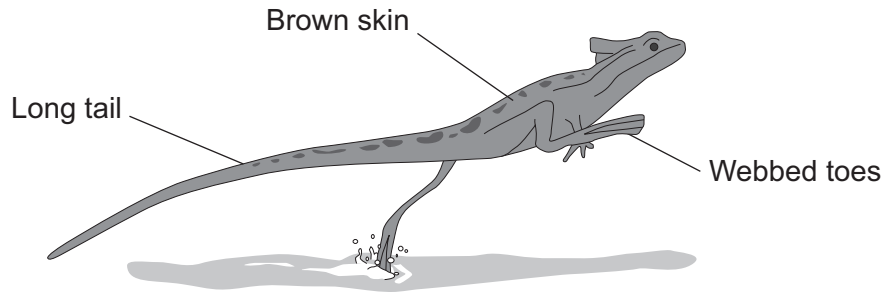
Basilisk lizards are often found resting on branches of trees that grow next to water. Basilisk lizards can run across the surface of the water.

1 (a) Draw **one** line from each adaptation of the lizard to the advantage of the adaptation.

Adaptation   **Advantage**

For camouflage on
branches of trees

Toes on the back
feet are webbed

Helps the lizard to
balance when running

Long tail

Warning colours to
deter predators

Brown skin

Increases surface
area in contact with
the water

(3 marks)

1 (b) Suggest **one** advantage to the basilisk lizard of being able to run across the surface of the water.

....

....

(1 mark)

1 (c) Animals, such as lizards, compete with each other.

Give **two** factors that animals compete for.

Tick (✓) **two** boxes.

Oxygen ☐

Food ☐

Territory ☐

Light ☐

(2 marks)

6

Turn over for the next question

Turn over ▶

2   The body controls internal conditions.

2 (a)   Use words from the box to complete the sentences about water loss from the body.

kidneys	liver	lungs	skin

2 (a) (i) Water is lost in sweat via the ....

(1 mark)

2 (a) (ii) Water is lost in urine via the ....

(1 mark)

2 (a) (iii) Water is lost in the breath via the ....

(1 mark)

2 (b)   Students investigated body temperature in the class.

The bar chart shows the results.
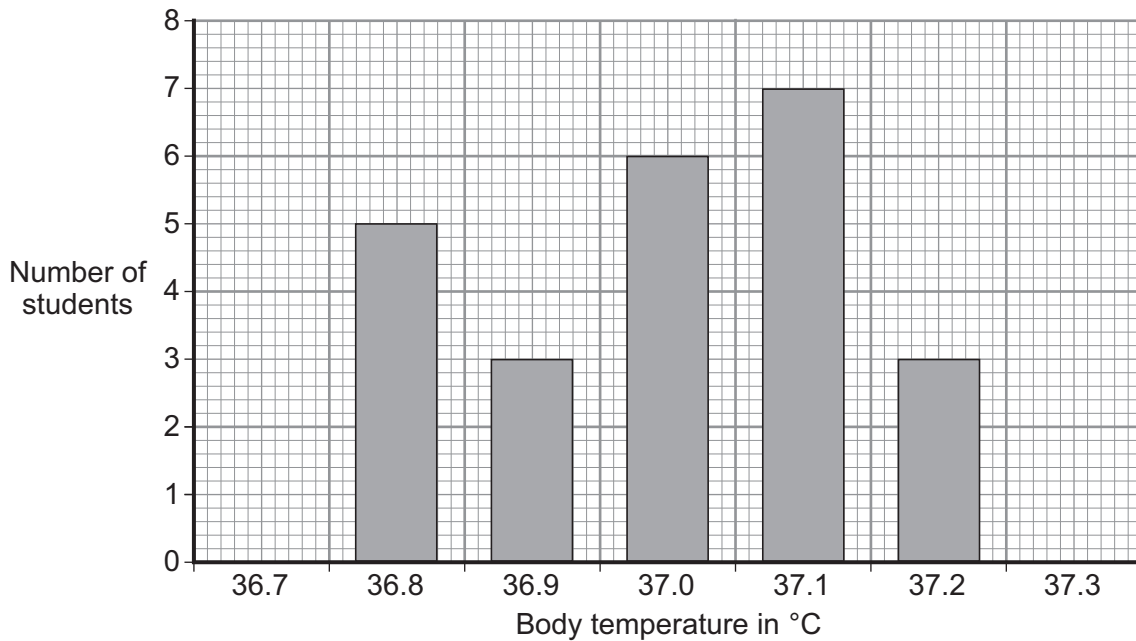
2 (b) (i) One student used the bar chart to calculate the mean body temperature of the class. The student calculated the mean body temperature as 37.0 °C.

How did the student use the bar chart to calculate the mean?

....

....

....

....

(2 marks)

2 (b) (ii) How many students had a body temperature higher than the mean of 37.0 °C?

....

(1 mark)

2 (b) (iii) Body temperature must be kept within a narrow range.

Why?

....

....

(1 mark)

7

Turn over for the next question

Turn over ▶

3   Viruses and bacteria cause diseases in humans.

3 (a)   Draw a ring around the correct word to complete the sentence.

Organisms that cause disease are called

algae.
pathogens.
vaccines.

(1 mark)

3 (b)   In August 2011 the United Nations gave a warning that there was a new strain of the bird flu virus in China.

Bird flu may kill humans. The new strain of the bird flu virus could cause a *pandemic* very quickly.

3 (b) (i)   What is a *pandemic*?

Tick (✓) **one** box.

A disease affecting the people all over one country.   ☐

A disease affecting hundreds of people.   ☐

A disease affecting people in many countries.   ☐

(1 mark)

3 (b) (ii)   The swine flu virus is carried by pigs.

The bird flu virus is likely to spread much more quickly than the swine flu virus.

Suggest **one** reason why.

....

....

(1 mark)

3 (c)   This notice is from a doctor's surgery.

> **Unfortunately, antibiotics will NOT get rid of your flu.**

3 (c) (i)   Why will antibiotics **not** get rid of flu?

....

....

(1 mark)

3 (c) (ii)   The symptoms of flu include a sore throat and aching muscles.

What would a doctor give to a patient to relieve the symptoms of flu?

....

(1 mark)

3 (c) (iii)   It is important that antibiotics are **not** overused.

Explain why.

Use words from the box to complete the sentence.

antibody	bacteria	immune	resistant	viruses

Overuse of antibiotics might speed up the development

of .... strains of ....

(2 marks)

7

Turn over ▶

4 Students tested eight different foods, **A** – **H**, for carbohydrate, fat and protein.

The table shows the students' results.

Food	Carbohydrate	Fat	Protein
A	✗	✓	✓
B	✗	✓	✓
C	✓	✓	✓
D	✓	✗	✓
E	✗	✗	✗
F	✓	✗	✗
G	✓	✗	✗
H	✓	✗	✓

Key
✓ = present
✗ = not present

4 (a) (i) How many of the foods contained **only** carbohydrate?

....

(1 mark)

4 (a) (ii) Which of the foods contained carbohydrate **and** fat **and** protein?

Tick (✓) **one** box.

B, **C** and **D** only ☐

B and **D** only ☐

C only ☐

(1 mark)

4 (b) A person's diet should contain carbohydrate **and** fat **and** protein.

Give **two** reasons why.

1 ....

....

2 ....

....

(2 marks)

4 (c) As well as carbohydrate, fat and protein, the body also needs vitamins and mineral ions.

4 (c) (i) Why does the body need vitamins and mineral ions?

....

(1 mark)

4 (c) (ii) Draw a ring around the correct answer to complete the sentence.

Compared to the mass of carbohydrates, the body needs

| a greater |
| a smaller | mass
| the same |

of vitamins and mineral ions.

(1 mark)

6

Turn over for the next question

Turn over ▶

5   Cannabis is an illegal drug.

5 (a)   What type of illness might be caused by smoking cannabis regularly?

....
(1 mark)

5 (b)   The graph shows the use of cannabis by 16−24 year olds in the UK between 1996 and 2008.
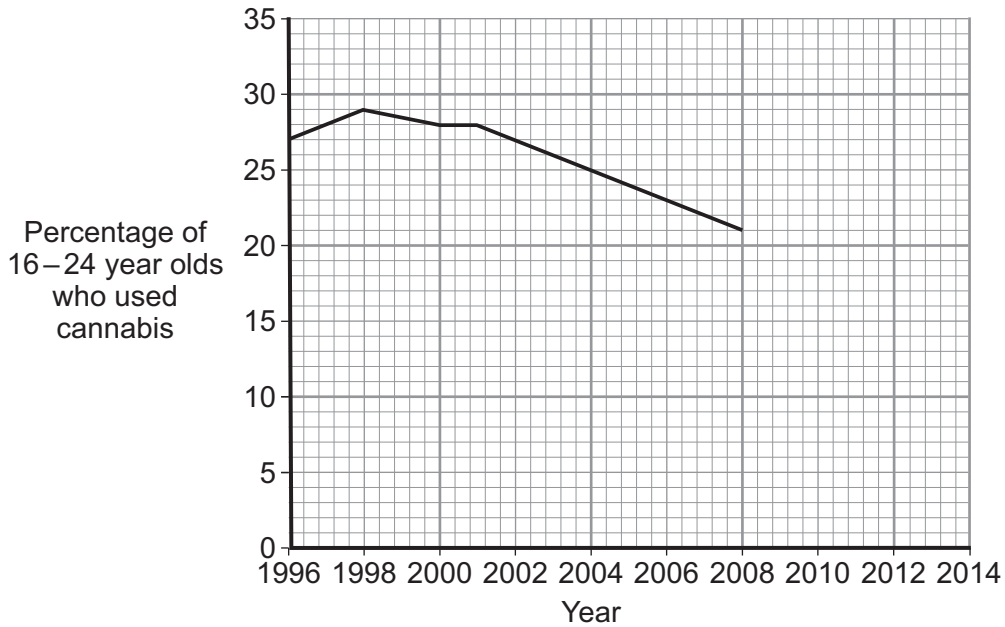
5 (b) (i)   Use the graph to predict the percentage of 16−24 year olds who will use cannabis in 2014.

Show your working **on the graph**.

Percentage = ...
(2 marks)

5 (b) (ii) Illegal drugs are classified as Class A, Class B or Class C.
Class C drugs are the least dangerous.

In 2004, the government changed the classification of cannabis from Class B to Class C.

In 2009, the government changed the classification of cannabis back from Class C to Class B.

Do you think that changing the classification of cannabis back to a Class B drug will reduce the percentage of 16–24 year olds who use cannabis?

Use evidence from the graph to explain your answer.

....

....

....

....

....

....

(2 marks)

5

Turn over for the next question

Turn over ▶

6 The photographs show a food chain from a seashore. The photographs are **not** to the same scale.

Seaweed	Limpet	Crab	Gull
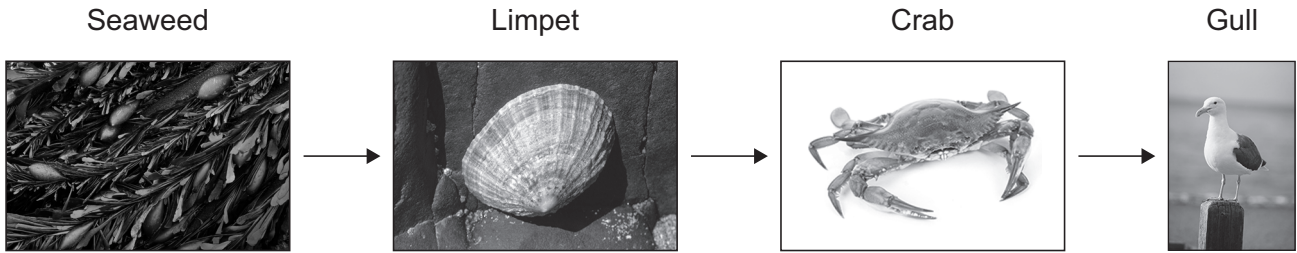
Students estimated the population and biomass of each of the organisms on part of a seashore.

The table shows the students' results.

Organism	Population	Mean mass of one organism in grams	Biomass of population in grams
Seaweed	50	4000	200 000
Limpet	1200	30	36 000
Crab	100	90	9 000
Gull	2	900	

6 (a) (i) Use the data in the table to calculate the biomass of the gull population.

....

....

Biomass = ... g

(1 mark)

6 (a) (ii) Draw a pyramid of biomass for this food chain.

Label the pyramid.

(2 marks)

6 (b) The biomass of the crab population is much less than the biomass of the limpet population.

Suggest **two** reasons why.

1 ....

....

2 ....

....

(2 marks)

5

Turn over for the next question

Turn over ▶

7 (a) Complete the sentences about evolution.

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

7 (a) (i) Darwin suggested the theory of evolution by

| artificial |
| natural |
| asexual |

selection.

(1 mark)

7 (a) (ii) Darwin's theory of evolution says that all species of living things have

evolved from

| artificial |
| complex |
| simple |

life forms.

(1 mark)

7 (a) (iii) Most scientists believe that life first developed about

| three billion |
| three million |
| three thousand |

years ago.

(1 mark)

7 (b) Darwin's theory of evolution was only slowly accepted by other people.

Give **two** reasons why.

1 ....

....

2 ....

....

(2 marks)

7 (c) **Diagram 1** shows one model of the relationship between some animals.

Diagram 1

Whale   Cow   Hippopotamus   Pig   Camel
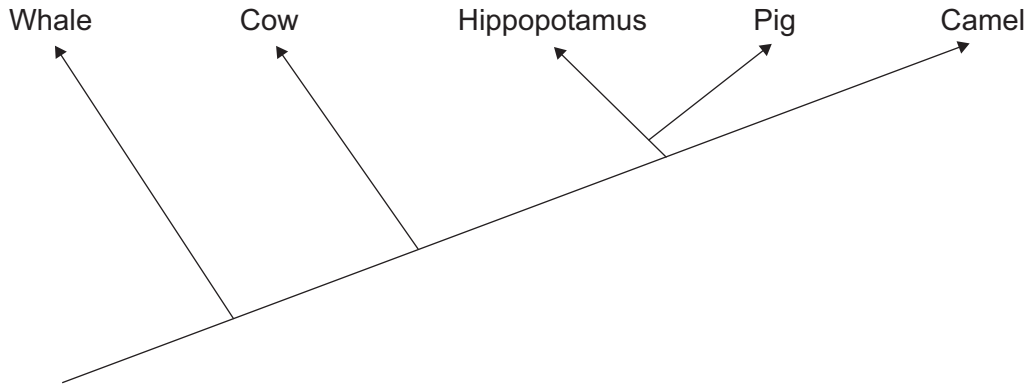
7 (c) (i) Complete the sentence.

The model shown in **Diagram 1** is an evolutionary ....

(1 mark)

7 (c) (ii) Which **two** of the animals in **Diagram 1** are most closely related?

.... and ....

(1 mark)

7 (c) (iii) **Diagram 2** shows a more recent model of the relationship between the animals.

Diagram 2

Whale   Cow   Hippopotamus   Camel   Pig
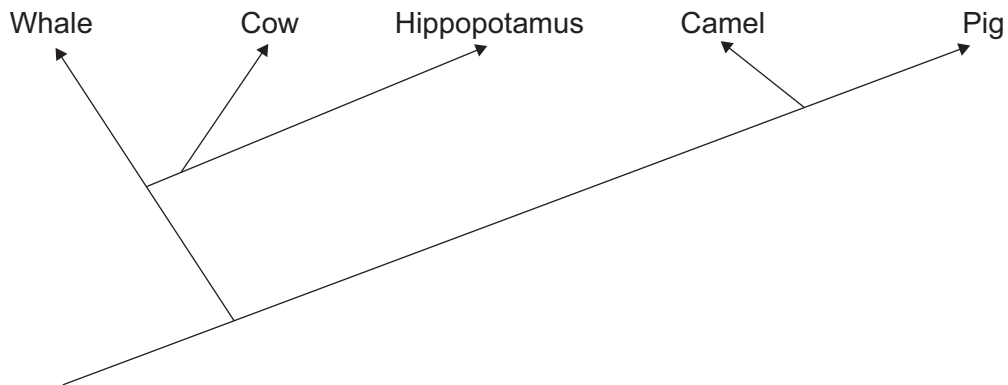
Suggest **one** reason why scientists have changed the model of the relationships between the animals shown in the diagram.

Draw a ring around the correct answer.

| more powerful computers | new evidence from fossils | new species discovered |

(1 mark)

8

Turn over ▶

8 Peas grow in pods on pea plants.

Pod
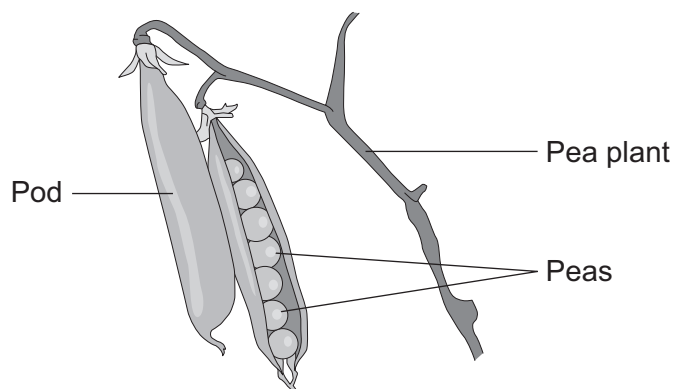
Pea plant

Peas

A gardener grew four varieties of pea plants, **A**, **B**, **C** and **D**, in his garden.
The gardener counted the number of peas in each pod growing on each plant.

The table shows his results.

Variety	Range of number of peas in each pod	Mean number of peas in each pod
A	2−6	4
B	3−7	5
C	3−8	6
D	6−8	7

8 (a) Give **one** environmental factor and **one other** factor that might affect the number of peas in a pod.

Environmental factor ....

Other factor ....

(2 marks)

8 (b) The gardener thinks that he will get the largest mass of peas from his garden if he grows variety **D**.

Why is the gardener **not** correct?

Suggest **one** reason.

....

....

(1 mark)

8 (c) It is important that carbon is cycled through living things.

After he has picked the peas, the gardener puts the dead pea plants onto a compost heap.

Over the next few months, the carbon in the carbon compounds from the pea plants is returned to the air.

Describe how.

....

....

....

....

....

....

....

....

....

....

(4 marks)

7

Turn over for the next question

9 A student is given a tube containing a liquid nutrient medium. The medium contains one type of bacterium.

9 (a) *In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.*

The student is told to grow some of the bacteria on agar jelly in a Petri dish.

Describe how the student should prepare an uncontaminated culture of the bacterium in the Petri dish.

You should explain the reasons for each of the steps you describe.

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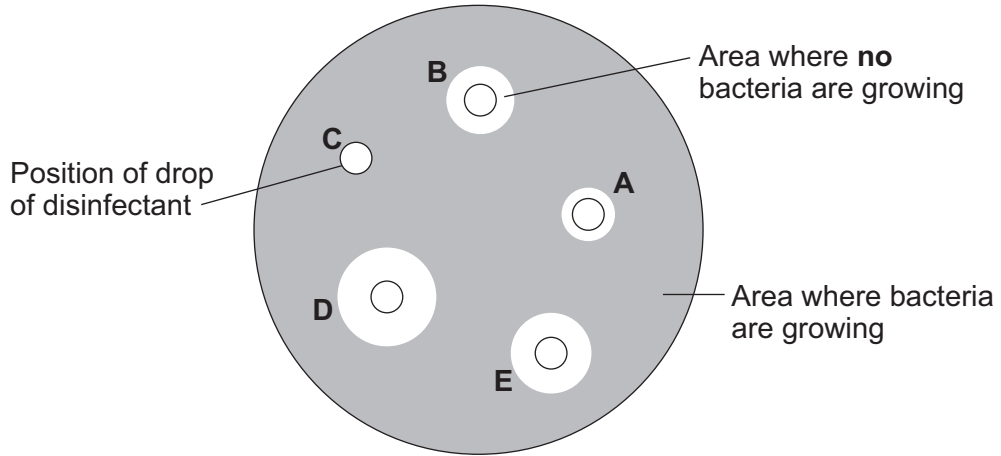
(6 marks)

9 (b) After the culture had been prepared, the student added one drop of each of five disinfectants, **A**, **B**, **C**, **D** and **E**, onto the culture.

The diagram shows the appearance of the Petri dish 3 days later.

9 (b) (i) There are areas on the agar jelly where **no** bacteria are growing.

Why?

....

....

(1 mark)

9 (b) (ii) The student concluded that disinfectant **D** would be the best for using around the home.

Give **one** reason why the student might be correct.

....

....

....

Give **one** reason why the student might **not** be correct.

....

....

....

(2 marks)

END OF QUESTIONS

There are no questions printed on this page

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ANSWER IN THE SPACES PROVIDED