OCR
RECOGNISING ACHIEVEMENT

GENERAL CERTIFICATE OF SECONDARY EDUCATION
GATEWAY SCIENCE
BIOLOGY B
Unit 1 Modules B1 B2 B3
FOUNDATION TIER
THURSDAY 7 JUNE 2007

F B631/01

Morning
Time: 1 hour

Calculators may be used.
Additional materials: Pencil
                       Ruler (cm/mm)

Candidate
Name

Centre
Number

Candidate
Number

INSTRUCTIONS TO CANDIDATES

- Write your name, Centre Number and Candidate Number in the boxes above.
- Answer **all** the questions.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- Do **not** write in the bar code.
- Do **not** write outside the box bordering each page.
- WRITE YOUR ANSWER TO EACH QUESTION IN THE SPACE PROVIDED. ANSWERS WRITTEN ELSEWHERE WILL NOT BE MARKED.

INFORMATION FOR CANDIDATES

- The number of marks for each question is given in brackets [ ] at the end of each question or part question.

FOR EXAMINER'S USE

Section	Max.	Mark
A	**20**	
B	**20**	
C	**20**	
TOTAL	**60**	

This document consists of **20** printed pages.

[Turn over

Answer **all** the questions.

Section A – Module B1

1 Jack is going skiing in the snow.

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He is worried about getting too cold.

(a) Put a ⟨ring⟩ around Jack's normal body temperature.

27 °C   **37 °C**   **47 °C**   **57 °C**   **67 °C**

[1]

(b) Jack puts on special clothes to keep him warm whilst he is skiing.

There are other ways that Jack's body may change to keep warm when he is out in the cold.

Put ticks (✔) in **two** boxes to show how Jack's body might change to keep him warm.

his respiration becomes faster ☐

more blood flows close to his skin ☐

he shivers more ☐

he sweats more ☐

[2]

(c) When Jack starts skiing, he needs more energy.

Finish the following sentences about Jack's skiing.

Use words from this list.

carbon dioxide

glucose

heart

lactic acid

lung

liver

oxygen

When Jack starts skiing, his muscles work harder.

This means that his muscles need to receive .... and

.... more quickly.

To do this, Jack's .... beats faster.

[3]

[Total: 6]

[Turn over

2 Prasana likes gardening.

He has a plant that has very pretty flowers.

He wants to grow many identical copies of the plant so that they all have the same colour flowers.

(a) Finish the following sentences about Prasana's plants.

Use words from the list.

asexual   **clones**   **cytoplasm**   **genes**

gametes   **nucleus**   **sexual**

The characteristics of Prasana's plant are controlled by coded instructions called

....

These instructions are found in the .... of each cell of the plant.

So that all the plants have identical flowers, Prasana uses .... reproduction to make more identical plants.

The individuals produced by this type of reproduction are called ....

[4]

(b) Prasana finds that one new plant has a shoot with different coloured flowers.
He thinks that this has been caused by a mistake in copying the genetic instructions.
Look at the list.

breeding   **fertilisation**   **mutation**   **variation**

Put a (ring) around the name given to this type of mistake.

[1]

[Total: 5]

3 Steve eats a beef burger in a roll and drinks a glass of beer.

A

roll: contains carbohydrate and fibre

B

beer: contains water and alcohol

D

lettuce: contains vitamin C and fibre

C

beef burger: contains protein and iron

© OCR

(a) Which part of the meal helps to prevent the disease scurvy?
Choose from **A**, **B**, **C** or **D**.

.... [1]

(b) (i) Steve is 18 years old.

His body mass is 80 kilograms.
This meal contains 20 g of protein.

How many of these meals would supply Steve with his RDA for protein?
Use this formula:

RDA in grams = 0.75 × body mass in kilograms

number of meals .... [1]

(ii) The beef burger contains protein.

Why is protein important for a teenager?

.... [1]

[Turn over for the remainder of question 3

(iii) Explain why the proteins in the beef burger are called 'first class proteins'.

....

.... [2]

(iv) Drinking too much alcohol over a long period of time can damage some organs in the body.

Write down the name of **one** of these organs.

.... [1]

[Total: 6]

4 Many diseases in the body are caused by microorganisms.

These microorganisms are called pathogens.

(a) Some of these pathogens are bacteria.

Write down the name of **one other** type of pathogen.

.... [1]

(b) When a pathogen enters a human body, the pathogen is attacked by the immune system.

A number of chemicals are important in this response.

Draw a line from each **chemical** to its correct **meaning**.

chemical	meaning

| antibody | a chemical on the surface of pathogens |

| antigen | a chemical released by white blood cells |

| toxin | a poisonous chemical that is produced by pathogens |

[2]

[Total: 3]

[Turn over

Section B – Module B2

5 The picture shows a branch on a pine tree.

© OCR

(a) (i) Trees make their own food.

What name is given to the process trees use to make their own food?

Put a (ring) around the correct answer.

digestion **photosynthesis** **respiration**

[1]

(ii) Trees make the sugar glucose.

Glucose is then used in different ways.

Write down **two** ways that trees use glucose.

1 ....

2 .... [2]

(b) The wood from pine trees is a sustainable resource.

Put a tick (✔) in the box next to **another** sustainable resource.

coal ☐

copper ☐

fish ☐

natural gas ☐

[1]

[Total: 4]

6 The picture shows a polar bear.

© iStockphoto.com / Silense

(a) Look at the list.

amphibians

fish

mammals

reptiles

Finish the sentence by choosing the best word from the list.

The polar bear belongs to the vertebrate group called .... [1]

(b) The polar bear hunts seals for food.

(i) What word describes an animal that **hunts** for food?

.... [1]

(ii) What word describes an animal that is **hunted** for food?

.... [1]

(c) Polar bears are adapted to hunt.

They have eyes in the front of their heads.

Write down **two other** ways that polar bears are adapted to hunt.

1 ....

....

2 ....

.... [2]

[Total: 5]

[Turn over

7 The diagram shows a key used to name four different ducks.

```
                    ┌──────────┐
                    │ Does it  │
                    │ have a   │
                    │ green    │
                    │ head?    │
                    └──────────┘
                  no            yes
         ┌──────────────┐      ┌──────────────┐
         │ Does it have a│     │ Does it have │
         │ long tail?   │      │ a grey body? │
         └──────────────┘      └──────────────┘
          yes        no         yes        no

        pintail   tufted duck   mallard   shoveler
```
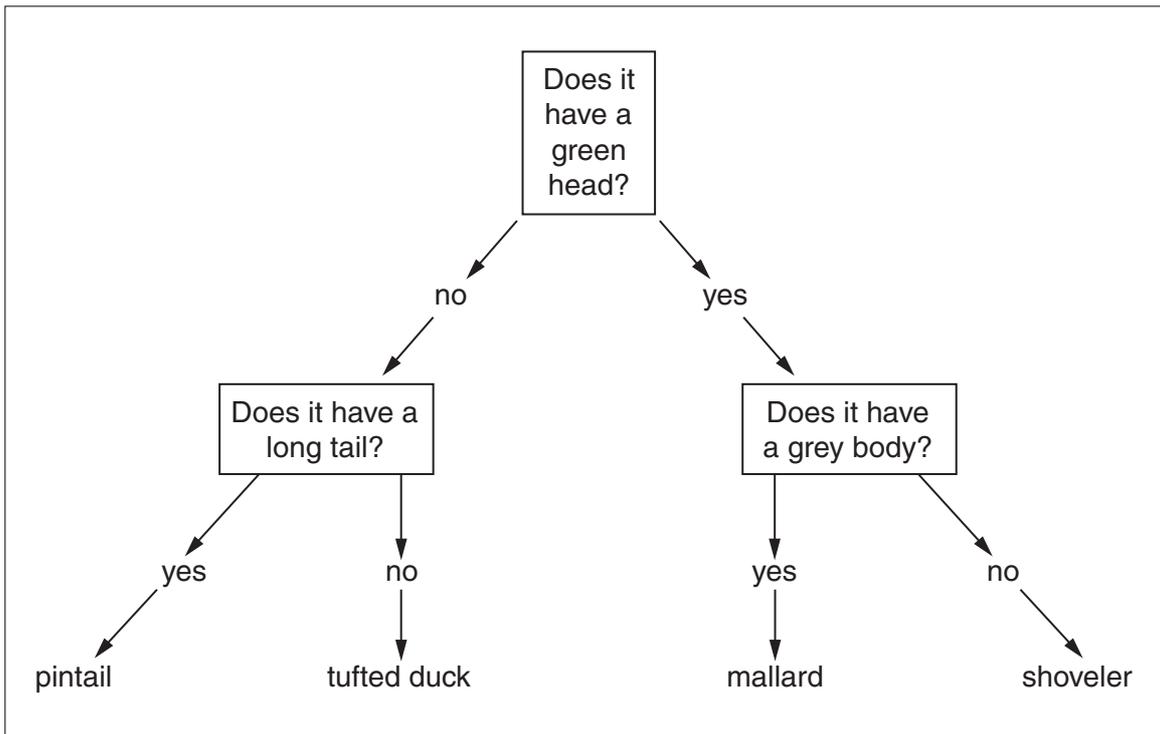
(a) Write down **two** characteristics of a mallard duck.

Use the key.

1 ....

2 .... [2]

(b) All of the ducks live in the same habitat.

The ducks compete for space.

Suggest **one other** thing the ducks may compete for.

.... [1]

(c) Look at the picture.
It is an American duck called the ruddy duck.

© Mike Yip, www.vancouverislandbirds.com

The ruddy duck belongs to the class of vertebrates called birds.

Write down **one** characteristic that **only** birds have.

.... [1]

[Turn over for the remainder of question 7

(d) Some ruddy ducks escaped from captivity and settled in Spain in the 1940s.

They competed with the Spanish white-headed duck.

The graph shows the number of white-headed ducks in Spain between 1967 and 1997.

© Torres *unpubl. Data*
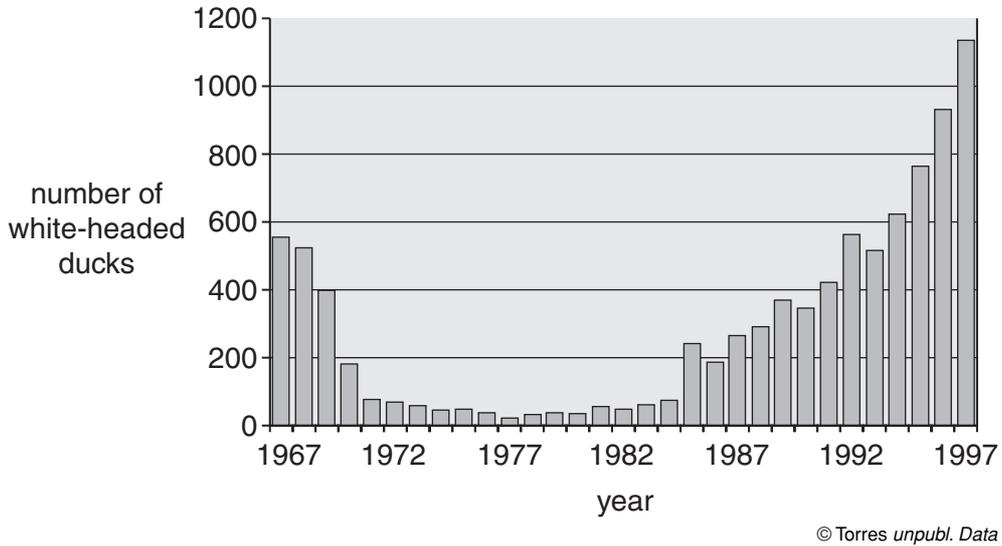
(i) Look at the graph.

Describe the change in population of the white-headed duck between 1967 and 1997.

....

.... [2]

(ii) In 1977, there were only 22 white-headed ducks left in Spain.

To prevent the extinction of the white-headed duck, ruddy ducks were killed.

Describe **one other** way the white-headed duck might have been helped.

....

.... [1]

[Total: 7]

8 The picture shows a fossil of a pterodactyl.

© Heather Angel / Natural Visions

(a) Pterodactyls no longer exist on Earth.

What name is used to describe a species that no longer exists?

.... [1]

(b) There are many other species that no longer exist.

Look at the list of species.

dodo   **gorilla**   **osprey**   **panda**

Put a (ring) around the species that no longer exists. [1]

**(c)** Describe how the pterodactyl became fossilised.

....

....

.... [2]

[Total: 4]

[Turn over

9 **(a)** The diagram shows a sperm cell and an egg cell.

sperm cell
(not to scale)

egg cell
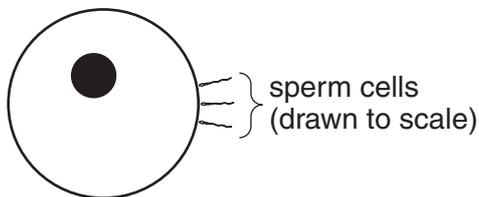
sperm cells
(drawn to scale)

   (i) Look at the diagrams.

   Describe **one** way that you can **see** that the sperm cell is different from the egg cell.

   Explain how this difference helps the sperm cell do its job.

   how the sperm cell is different ....

   ....

   how this helps the sperm cell ....

   ....[2]

   (ii) Lots of sperm cells are produced at the same time.

   Explain why.

   ....[1]

(b) Kangaroos have 12 chromosomes in each **skin** cell.

   How many chromosomes are in a **sperm** cell from a kangaroo?

   ....[1]

   [Total: 4]

10 (a) Mary is investigating how cress seedlings grow.

cress seedlings

She wants to do an experiment to find out if cress seedlings grow towards light.

Describe how she should do her experiment.

In your answer, include
  • how to set up the equipment
  • what to look for
  • how to make it a fair test.

....

....

....

....

....

....

....[3]

(b) Mary finds out that cress seedlings do grow towards light.

Look at the list.

positive geotropism

negative geotropism

positive phototropism

negative phototropism

Which term describes the response of cress seedlings growing towards light?

Choose your answer from the list.

....[1]

[Total: 4]

[Turn over

11 (a) The table shows where different substances enter and leave the blood in humans.

Complete the table.

substance	where substance enters the blood	where substance leaves the blood
oxygen	....	body tissues
....	body tissues	lungs
digested food	....	body tissues

[3]

(b) Substances such as oxygen can enter and leave cells by diffusion.

Look at the diagrams of five cells.

The dots show the concentration of oxygen.
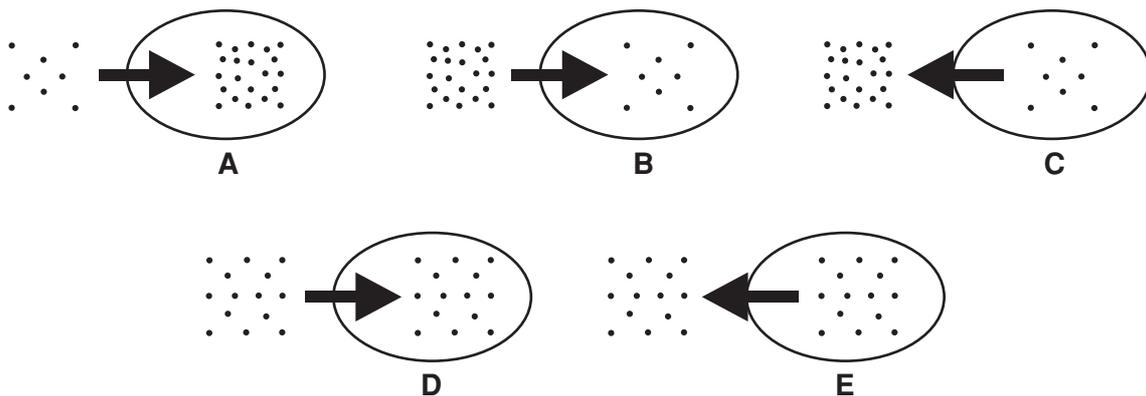
Which diagram shows the diffusion of oxygen?

Choose **A**, **B**, **C**, **D** or **E**.

....[1]

[Total: 4]

12 **(a)** The boxes show some parts of cells and their functions.

Draw a straight line to join each **part of the cell** with the correct **function**.

Draw only **three** lines.

part of the cell   **function**

| cytoplasm |

| carries genes |

| membrane |

| controls movement of substances in and out of cell |

| nucleus |

| where many chemical reactions happen |

[2]

[Turn over for the remainder of question 12

(b) Many chemical reactions in cells are controlled by enzymes.

Amylase is an enzyme that breaks down starch.

Clare is investigating how pH affects the time it takes for amylase to break down starch.

The table shows her results.

pH	time taken to break down starch in minutes
2	8.0
4	6.0
6	4.2
8	3.5
10	4.0

(i) Plot the results on the grid below. Finish the graph by drawing the best line.
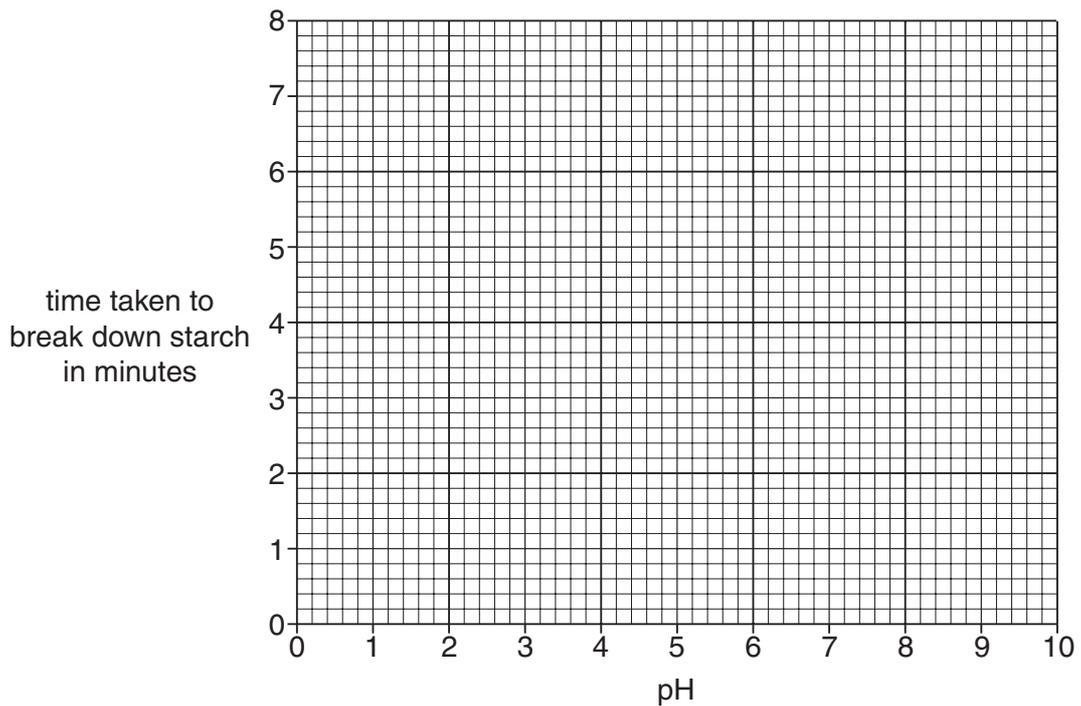
[2]

(ii) Look at the graph. What is the **optimum** pH of amylase?

....[1]

[Total: 5]

13 (a) Owen is a farmer. He has a herd of dairy cows.

The list shows features of some of his cows.

> **A aggressive behaviour**
> **B brown coat colour**
> **C high milk production**
> **D large horns**
> **E resistance to disease**

Owen wants to improve his herd by selective breeding.

Which two features should he select for?

Choose **two** letters from the list.

.... and ....[2]

(b) Owen also grows apples to sell.

His apples are large and taste sweet.

However, there are **not** many apples on each tree.

There are some wild apples growing near his farm.

The wild apples are small and taste sour.

Each wild apple tree produces lots of apples.
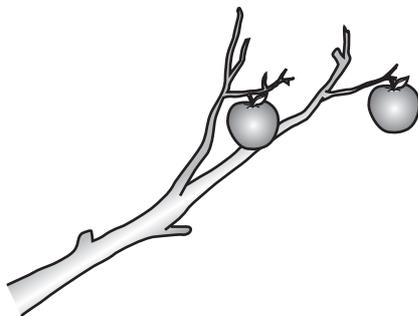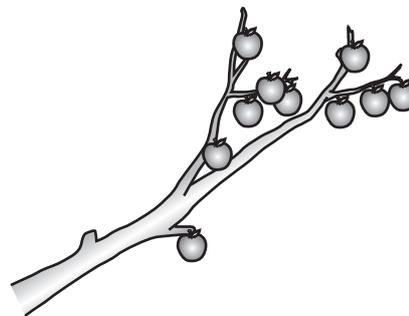
Owen's apples   **wild apples**

Owen thinks that if he breeds his apple trees with the wild apple trees he will **only** get apple trees that produce lots of large, sweet apples.

Will he **only** get apple trees that produce lots of large, sweet apples? ....

Explain your answer.

....

....[1]

[Total: 3]

END OF QUESTION PAPER

PLEASE DO NOT WRITE ON THIS PAGE