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RECOGNISING ACHIEVEMENT

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B631/01

GENERAL CERTIFICATE OF SECONDARY EDUCATION

GATEWAY SCIENCE

BIOLOGY B

Unit 1: Modules B1 B2 B3 (Foundation Tier)

TUESDAY 15 JANUARY 2008

Afternoon
Time: 1 hour

CUP/T48533

Candidates answer on the question paper.
Additional materials (enclosed):
None

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

Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

INSTRUCTIONS TO CANDIDATES

- Write your name in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Do **not** write outside the box bordering each page.
- Write your answer to each question in the space provided.

INFORMATION FOR CANDIDATES

- The number of marks for each question is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this paper is **60**.

FOR EXAMINER'S USE		
Section	**Max**	**Mark**
A	**20**	
B	**20**	
C	**20**	
TOTAL	**60**	

This document consists of **18** printed pages and **2** blank pages.

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Answer **all** the questions.

Section A – Module B1

1 Look at the list of things found inside cells.

amino acid

bases

chromosomes

DNA

genes

protein

Finish the following sentences.

Choose the best words from the list.

Inside cells, there are coded instructions called …….. .

The instructions are made of a chemical called …… .

The instructions are carried inside the nucleus on structures called …….. .

[3]

[Total: 3]

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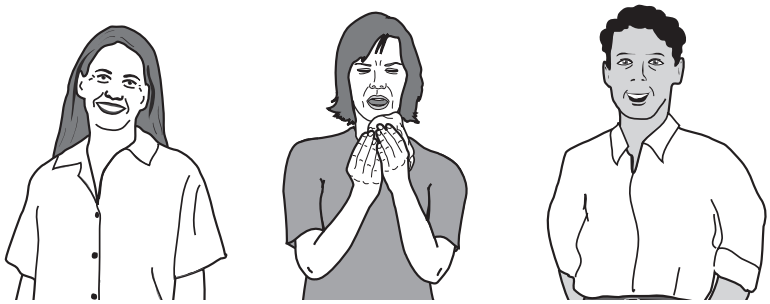
2 Ann, John and Lynne are friends.

Ann has a cold.

When Ann sneezes, John and Lynne both breathe in some of the viruses that cause the cold.



Later, John develops a cold but Lynne does not.

(a) Suggest why Lynne does **not** develop the cold even though she does breathe in the viruses.

.....

..... [1]

(b) Is a cold an infectious disease or a non-infectious disease? ……

Explain your answer.

.....

..... [1]

(c) Look at the list of diseases and disorders.

athlete's foot

cholera

cystic fibrosis

dysentery

flu

(i) Write down **one** disease caused by a virus.

Choose from the list.

answer ..... [1]

(ii) Write down **one** inherited disorder.

Choose from the list.

answer..... [1]

[Total: 4]

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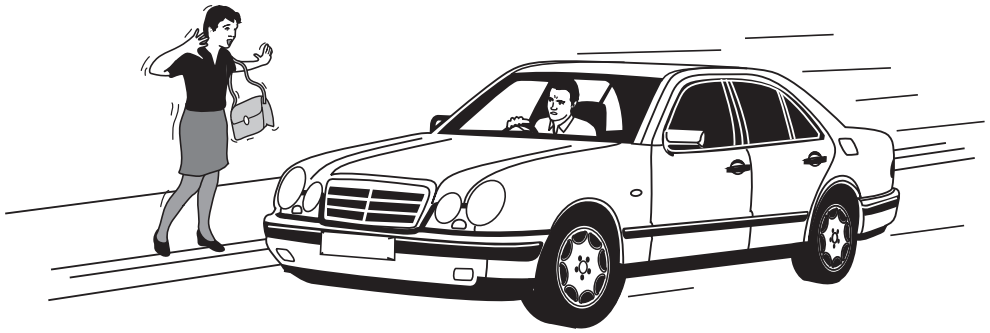
3 Natasha is starting to cross the road.

A car is coming towards her.

When Natasha notices the car, she jumps back quickly without thinking.



(a) Natasha sees the car coming with her eyes.

What other sense organ does she use to notice the car?

Put a (ring) around the correct answer.

ear **nose** **skin** **tongue**

[1]

(b) **(i)** Natasha's friend, Vicki, says that jumping back from the car is an example of a reflex.

Is it a reflex? ……..

Explain your answer.

.....

..... [1]

(ii) If Natasha had been drinking alcohol, how would her response to the car have been different?

..... [1]

(c) Some people can only see with one eye.

Describe how this affects vision.

.....

..... [1]

[Total: 4]

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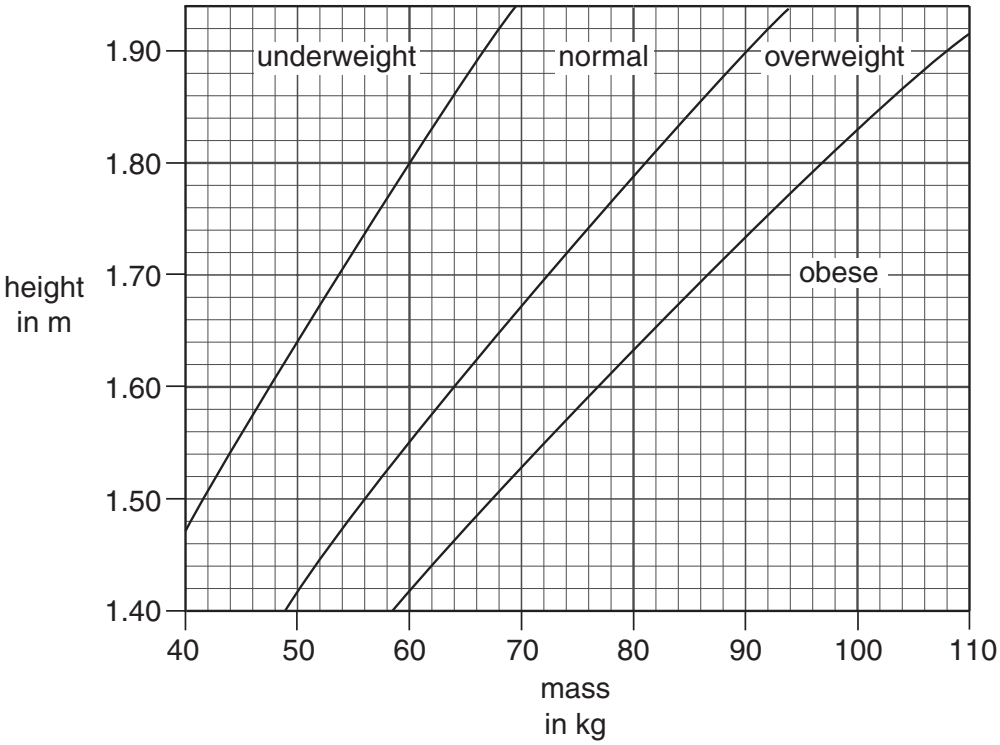
4 Chris and Sam want to see if they have suitable balanced diets.

They measure their mass and height.

	mass in kg	**height in m**
Chris	90	1.85
Sam	50	1.75

(a) (i) Use the information in the table and the BMI chart to work out whether **Chris** is underweight, normal, overweight or obese.



Put a (ring) around the correct answer.

underweight **normal** **overweight** **obese**

[1]

(ii) Sam works out that he is slightly underweight.

How much should he increase his mass by to reach a normal mass?

Use the information in the table and the BMI chart to work out your answer.

answer ..... kg [1]

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(b) Sam's doctor tells him to eat the recommended daily average intake of protein.

Work out Sam's recommended daily average intake (RDA).

Use information in the table and the formula:

$$\text{RDA in g} = 0.75 \times \text{body mass in kg}$$

answer ..... [1]

(c) A balanced diet also includes carbohydrates.

Why do we need carbohydrates?

..... [1]

[Total: 4]

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5 Ayshea is running in a long-distance race.

(a) During the race, Ayshea's breathing rate and heart rate increase.

Write about why her breathing rate and heart rate increase during the race.

.....

.....

.....

..... [3]

(b) During the race, Ayshea's muscles produce a lot of heat.

One way she loses this extra heat is by sweating more.

(i) Explain how sweating causes Ayshea to lose heat.

..... [1]

(ii) Losing extra heat keeps Ayshea's body temperature the same.

What word describes keeping body temperature the same?

Put a (ring) around the best answer.

dehydration **homeostasis** **hypothermia** **insulation** **respiration**

[1]

[Total: 5]

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SECTION B STARTS ON PAGE 10.

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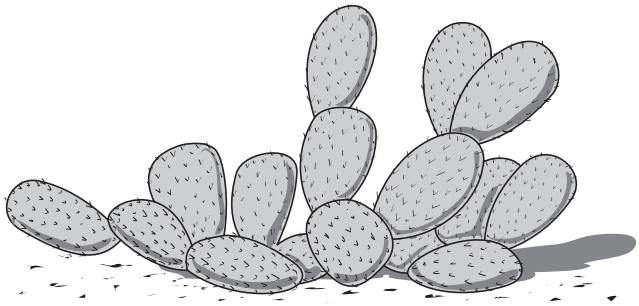
Section B – Module B2

6 Read the following article that appeared in a recent newspaper.

Money to grow Cacti!



Las Vegas is a city in the middle of the desert in America.

Water is in very short supply.

The local council have decided to take action.

They are paying local people one dollar per square metre to replace their grass lawns with a plant called the cow's tongue cactus.

They think that this will help to solve the water shortage.

(a) Cacti are plants.

Write down **one** characteristic of cacti that places them in the plant kingdom.

..... [1]

(b) The scientific name for the cow's tongue cactus is *Opuntia engelmannii.*

Put a tick (✓) in the box next to the system used to produce this name.

bimodal	☐
binomial	☐
classification	☐
conservation	☐

[1]

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(c) The council think that the cacti will need less water than grass plants.

Finish the following sentences by writing words in the gaps.

Choose your words from this list.

adapted	**insulated**	**photosynthesis**
reproduction	**respiration**	**resistant**

Plants such as cacti and grass use water for …… .

Cacti need less water than grass because they are ……

to living in hot, dry areas. [2]

[Total: 4]

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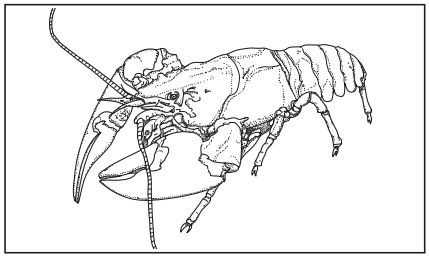
7 Read the passage about the British crayfish.

British Crayfish in Danger



Crayfish are small animals that live on the bottom of rivers.

Scientists have discovered that British crayfish are becoming endangered due to a larger, faster breeding American crayfish.

These crayfish were brought over from America for food but escaped into rivers.

This is disturbing the **community** living in the rivers.

There is a plan to move a **population** of British crayfish to a **habitat** where there are no American crayfish.

(a) (i) The two species of crayfish are competing with each other.

Write down **one** resource that they might be competing for.

..... [1]

(ii) The following sentences are meanings for some of the words in **bold** in the passage.

Write the correct word next to the meaning.

An area where the crayfish live. .....

All the living organisms found in one area of a river. .....[2]

(b) Crayfish may feed on snails.

(i) Write down **one** feature that you can see on the crayfish that makes them adapted to eating snails.

..... [1]

(ii) What name is given to an animal that hunts other animals for food?

Put a (ring) around your answer in this list.

competitor **parasite** **predator** **prey**

[1]

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(c) The passage says that British crayfish are becoming endangered.

(i) What does the word **endangered** mean?

.....

..... [1]

(ii) Put a (ring) around **one other** British animal in this list that is also endangered.

fox

osprey

pigeon

rat

[1]

[Total: 7]

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8 **(a)** Burning fossil fuels such as oil produces a number of substances that can cause pollution.

One of these substances is carbon dioxide.

(i) Put a (ring) around **one other** pollutant that is produced by burning fossil fuels.

CFCs

nitrogen

sewage

sulfur dioxide

[1]

(ii) The amount of fossil fuels that is being burned is increasing.

Write down **one** reason why.

..... [1]

(b) Many scientists think that increasing levels of carbon dioxide may alter the temperature of the Earth.

Finish the following sentences to show how they think this might happen.

Radiation from the sun passes through the …… surrounding the Earth.

The Earth's surface is warmed and some of the radiation is re-radiated.

The carbon dioxide in the air …… some of this radiation.

The Earth therefore warms up.

This process is called …… …… . [3]

[Total: 5]

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9 Byron wants to investigate two ecosystems near his house.

One is a natural pond.

The other is a pond that had been dug in a field that contained cows.

(a) Why is the pond in the cows' field called an **artificial** ecosystem?

..... [1]

(b) Byron samples the small animals living in the natural pond.

Put a tick (✓) next to the apparatus that he would use to sample the pond.

a net	☐
a pit-fall trap	☐
a pooter	☐

[1]

(c) These are the animals that he catches in this pond.

He sampled about 0.5 m^3 of the water in the pond.

The pond contains 200 m^3 of water in total.

Estimate the number of flatworms () living in the pond.

total number of flatworms = ... [2]

[Total: 4]

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Section C – Module B3

10 Scott is learning about cells.

He uses a microscope to look at some of his cheek cells.

The picture shows what he can see.

(a) Label the diagram.

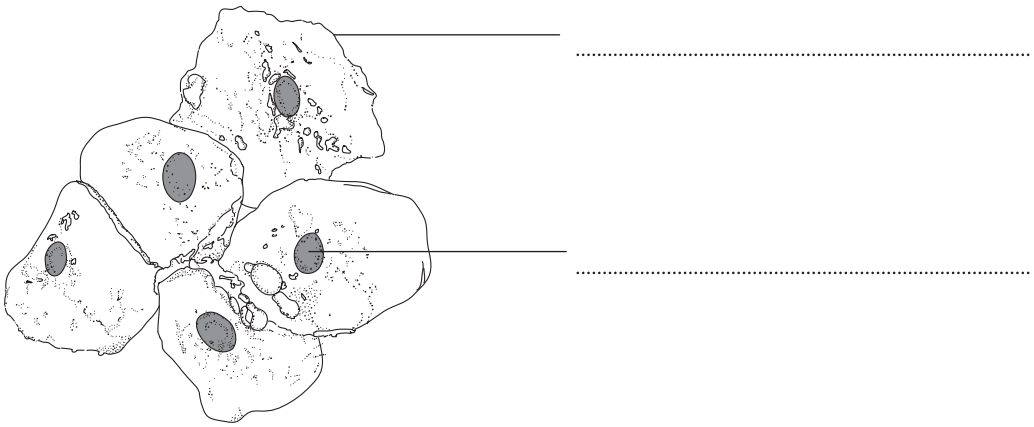
Choose the best words from this list.

cell membrane

cell wall

cytoplasm

nucleus



[2]

(b) Scott finds out about different cells in the body and the jobs they do.

Finish the table by writing the job of each cell.

The first one has been done for you.

cell	job it does
egg cell	develops into an embryo when fertilised
sperm cell	
white blood cell	
red blood cell	

[3]

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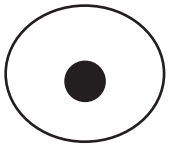
(c) Look at the picture of a fertilised egg cell.



If this egg implants into the uterus it will grow into a foetus.

Describe the **two** processes involved in growth.

1 .....

.....

2 .....

..... [2]

[Total: 7]

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11 Look at the picture.

It shows a strawberry plant reproducing.

(a) Finish the sentences about the strawberry plant.

Choose the **best** words from this list.

asexual **different** **identical** **sexual** **similar**

The strawberry plant sends out runners.

This is a type of reproduction called …… reproduction.

The runners have plantlets on them.

The plantlets are genetically …… to the parent plant. [2]

(b) Gardeners can make more plants by taking cuttings.

Here are four sentences (**A-D**) about taking cuttings.

A Put the cutting into a pot of sandy compost.

B Cut a short stem off the parent plant.

C Put a clear plastic bag over the plant.

D Dip the stem into plant hormone.

They are in the wrong order.

Fill in the boxes to show the correct order.

The first one has been done for you.

B			

[2]

(c) The plant stem needs to be dipped into plant hormone.

Explain why.

.....

..... [1]

[Total: 5]

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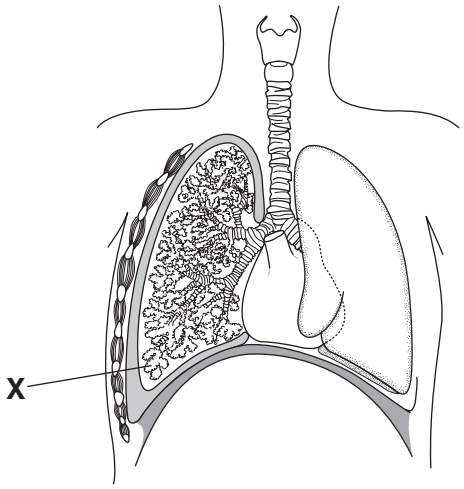
12 Look at the diagram. It shows the lungs and heart.



(a) Write down the name of part **X**.

..... [1]

(b) A gas leaves the lungs and enters the blood.

(i) Write down the name of this gas.

..... [1]

(ii) Describe how this gas enters the blood.

Include ideas about concentration in your answer.

.....

.....

.....

..... [2]

[Total: 4]

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13 Read the article about bacterial mutations.

Bacterial mutations

There are many types of bacteria.

New strains occur because bacteria keep mutating.

Some of these new strains have an advantage when it comes to fighting off antibiotics.

MRSA is a bacterium which is resistant to antibiotics.

(a) Write down what is meant by the term **mutation.**

..... [1]

(b) Mutations can occur spontaneously or are caused by some factors.

Write down **two** factors that can cause mutations to occur.

1 .....

2 ..... [2]

(c) Bacteria reproduce in the body and make us ill.

They reproduce by dividing into two.

This can take about 30 minutes.

If you start with 10 bacteria there would be 40 bacteria after 1 hour.

How many would there be after 3 hours?

number of bacteria ..... [1]

[Total: 4]

END OF QUESTION PAPER

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