

GENERAL CERTIFICATE OF SECONDARY EDUCATION
GATEWAY SCIENCE
BIOLOGY B

B631/01

Unit 1 Modules B1 B2 B3 (Foundation Tier)

Candidates answer on the question paper.
A calculator may be used for this paper.

OCR supplied materials:
None

Other materials required:

- Pencil
- Ruler (cm/mm)

Thursday 19 May 2011
Afternoon

Duration: 1 hour



Candidate forename		Candidate surname	
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Centre number						Candidate number				
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INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Answer **all** the questions.
- Do **not** write in the bar codes.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **60**.
- This document consists of **20** pages. Any blank pages are indicated.

Answer **all** the questions.

Section A – Module B1

- 1 (a) Some people sneeze almost immediately when they smell certain substances.

This is called a sneeze reflex.

- (i) The sneeze reflex involves a **stimulus** and a **sense organ**.

Draw **one** line **only** to link the correct stimulus in the sneeze reflex to the correct sense organ in the sneeze reflex.

stimulus	sense organ
pressure	nose
movement of air	skin
a chemical in the air	tongue
touch	ears

[1]

- (ii) Write down **two** reasons why this response is a reflex action.

1

2 [2]

(b) Some people sneeze when they see bright lights.



This disorder is inherited and is called the photic sneeze reflex.

Scientists are trying to find the gene that causes this disorder.

(i) Where in a cell would scientists find a gene?

..... [1]

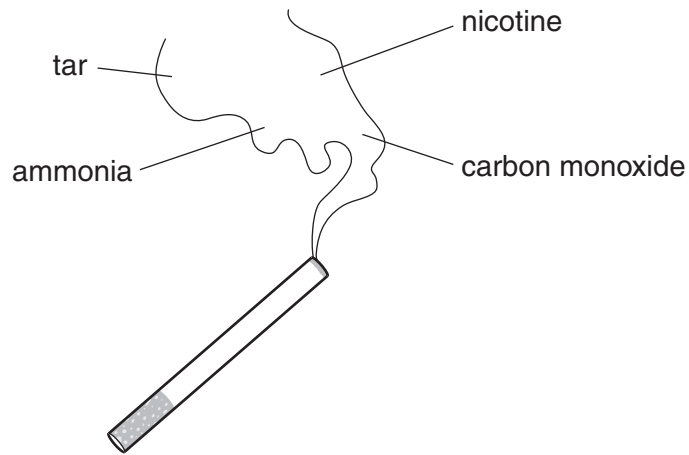
(ii) Photic sneeze reflex is an inherited disorder.

Write down the name of **one other** inherited human disorder.

..... [1]

[Total: 5]

2 (a) The diagram shows some of the substances that are produced by a burning cigarette.



(i) The nicotine produced by a burning cigarette is **addictive**.

What does addictive mean?

.....
..... [1]

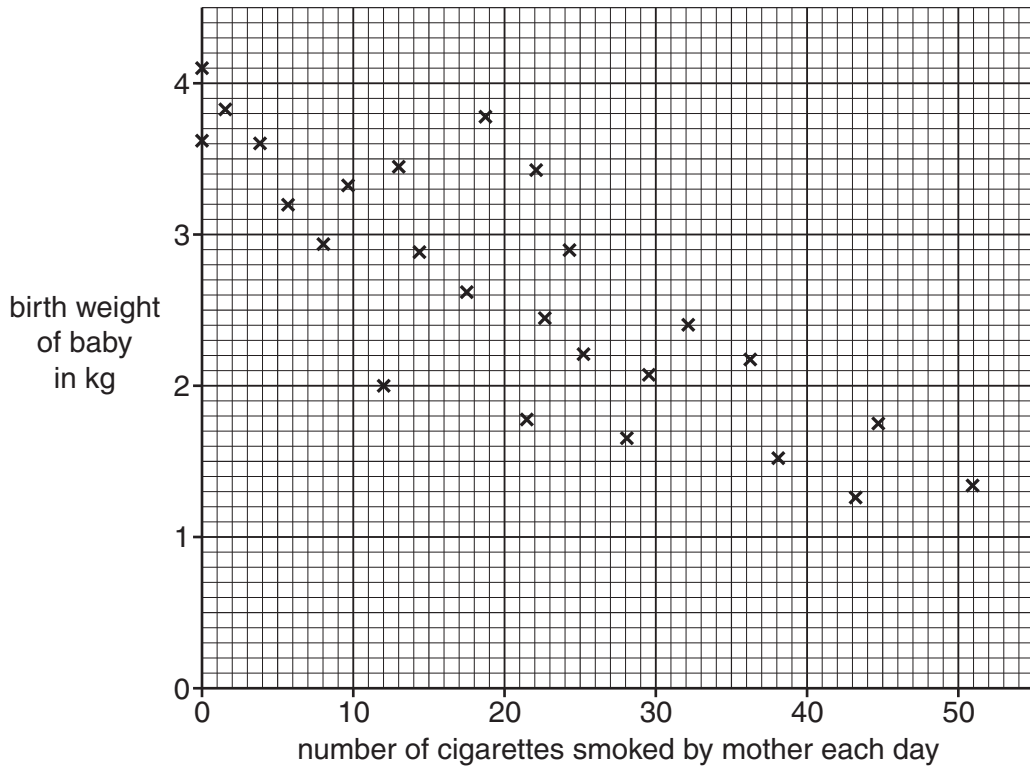
(ii) Write down the name of **one** disease that is caused by smoking cigarettes.

..... [1]

(b) Scientists recorded the birth weights of some babies.

They also recorded how many cigarettes each baby's mother smoked each day.

The results are shown on the graph.



(i) How many babies were involved in the study?

..... [1]

(ii) Write down **two** things which the scientists' results show.

1

.....

2

..... [2]

[Total: 5]

3 Katie decides to make a note of all the food she eats in one day.

She works out some of the contents of her food.

These are shown in the table.

meal	energy content in kJ	protein in g	iron in mg
breakfast	2000	5	5
lunch	2500	10	2
dinner	3000	25	1
supper	1000	5	2

(a) Anaemia is a disorder caused by a lack of haemoglobin.

Which of Katie's four meals would be best for preventing anaemia?

..... [1]

(b) Katie's breakfast contains several different nutrients.

Which of these five nutrients would supply her with the most energy?

fat fibre iron vitamin C water

answer [1]

(c) Katie has a mass of 52 kg.

She reads that the recommended amount of protein that she needs each day is called her **RDA**.

This can be worked out using the formula:

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

Katie decides that she is eating enough protein on this day.

Use the formula and the data in the table to explain why she thinks this.

.....

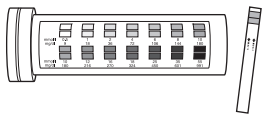
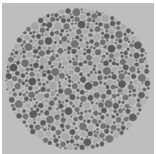

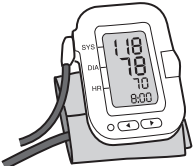
 [2]

[Total: 4]

4 (a) Different parts of the body can fail to work properly.

Tests can be done to try and find out the problem.

Draw straight lines to join each **test** to the **problem** that it can detect.

test	problem
measuring blood sugar level 	lens is the wrong shape
using colour deficiency charts 	cells in the pancreas are not working
testing for short sightedness 	stress
measuring blood pressure 	cells in the retina are not working

[2]

(b) Another test that can be done is to find out your pulse rate recovery time.

Describe how this test is done.

.....

.....

..... [2]

(c) The pulse is caused by waves of pressure in some blood vessels.

(i) Which type of blood vessel contains blood that is under high pressure?

..... [1]

(ii) Which organ forces the blood through these blood vessels?

..... [1]

[Total: 6]
Turn over

Section B – Module B2

5 Look at the picture of a seal.



(a) Finish the sentences about seals.

Choose words from the list.

aquarium community habitat population predators prey

Seals hunt fish for food. This means they are

The seals spend most of their time in the sea so the sea is their

All the animals and plants living in the sea make up the [3]

(b) Seals belong to a group of vertebrates called mammals.

Write down the name of **one other** vertebrate group.

..... [1]

(c) Seals compete with humans for fish.

Fish can be described as a sustainable resource.

This means it is possible to catch fish such as cod but still maintain their population.

Describe **one** way of maintaining fish populations as a sustainable resource.

.....

..... [1]

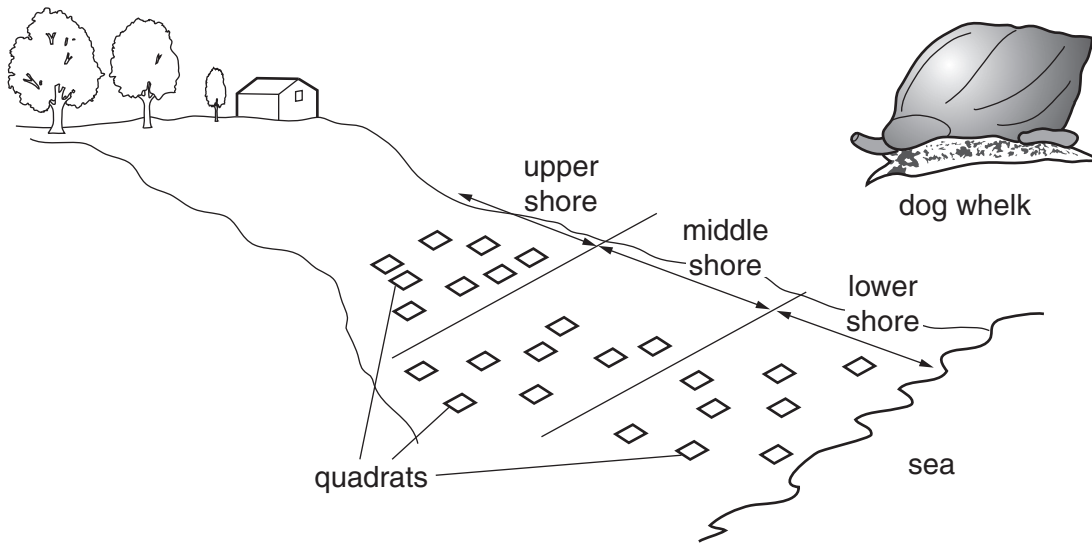
[Total: 5]

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Question 6 begins on page 10.

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6 Hannah and Alice investigate a group of shellfish called dog whelks on a rocky shore.



They divide the shore into three areas: upper, middle and lower.

They count the number of dog whelks in 8 quadrats in each area.

The table shows their results.

part of shore	number of dog whelks in each quadrat								average
upper	0	0	1	0	1	2	0	0	0.5
middle	2	3	4	3	2	3	3	4	
lower	1	1	2	0	2	0	1	1	1.0

(a) Calculate the average number of dog whelks in each quadrat in the middle shore.

You are advised to show your working.

.....

.....

.....

answer

[2]

(b) Hannah uses their results to conclude that more dog whelks live on the lower shore than the upper shore.

Suggest **two** reasons why more dog whelks might live on the lower shore than the upper shore.

1.....
.....
2.....
..... [2]

(c) The dog whelks compete with each other for food.

Write down **one other** thing they might compete for.

..... [1]

[Total: 5]

7 Read the information about the Petrified National Park in America.

The Petrified National Park

This is a park with a difference.
It contains the world's most colourful petrified wood.
Petrified wood is another name for fossilised wood.

200 million years ago large trees grew on the site.
The trees fell into rivers and were buried in mud.
Over time the wood changed into a hard mineral called quartz.
The trees had become fossils.



(a) When the trees were growing 200 million years ago they made their own food.

(i) Write down the name of the process which plants use to make food.

..... [1]

(ii) Plants need light to make their own food.

Plants also need **other** things to make their food.

Write down **one** thing that plants need to make food.

Choose from the list.

- cellulose**
- chlorophyll**
- starch**
- sugar**

answer [1]

(iii) When plants make food they also make a gas.

Write down the name of this gas.

..... [1]

(b) The trees were buried in mud.

They became fossilised as minerals replaced the wood.

Organisms can be preserved without being replaced by minerals.

Write down **one other** way organisms can be preserved for thousands of years.

.....
..... [1]

[Total: 4]

8 Look at the picture of a narwhal.



(a) Narwhals are hunted by polar bears for food.

They are adapted to avoid being caught by polar bears.

Animals that are adapted to avoid being caught often have eyes on the sides of their heads.

This gives them a wide field of view.

Write about **other** ways animals are adapted to avoid being caught as prey.

.....
.....
.....
.....
..... [3]

(b) Narwhals are one species of whale that are not **endangered**.

(i) What does the term endangered mean?

.....
..... [1]

(ii) Britain has many endangered animals.

Finish the sentences about endangered animals.

They include the osprey and the **red**

To help the animals, conservation groups protect their [2]

[Total: 6]

14
BLANK PAGE

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Section C – Module B3

9 This question is about growth in humans.

(a) Look at the five stages of human growth.

adolescence

childhood

infancy

maturity

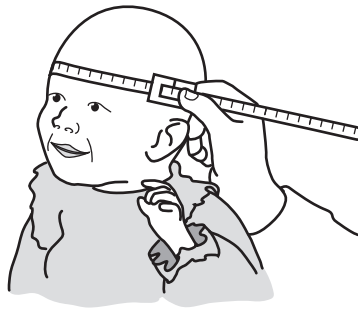
old age

Write down the words in the correct order, 1 to 5, in which they occur.

1	<input type="text"/>
2	<input type="text"/>
3	<input type="text"/>
4	<input type="text"/>
5	<input type="text"/>

[2]

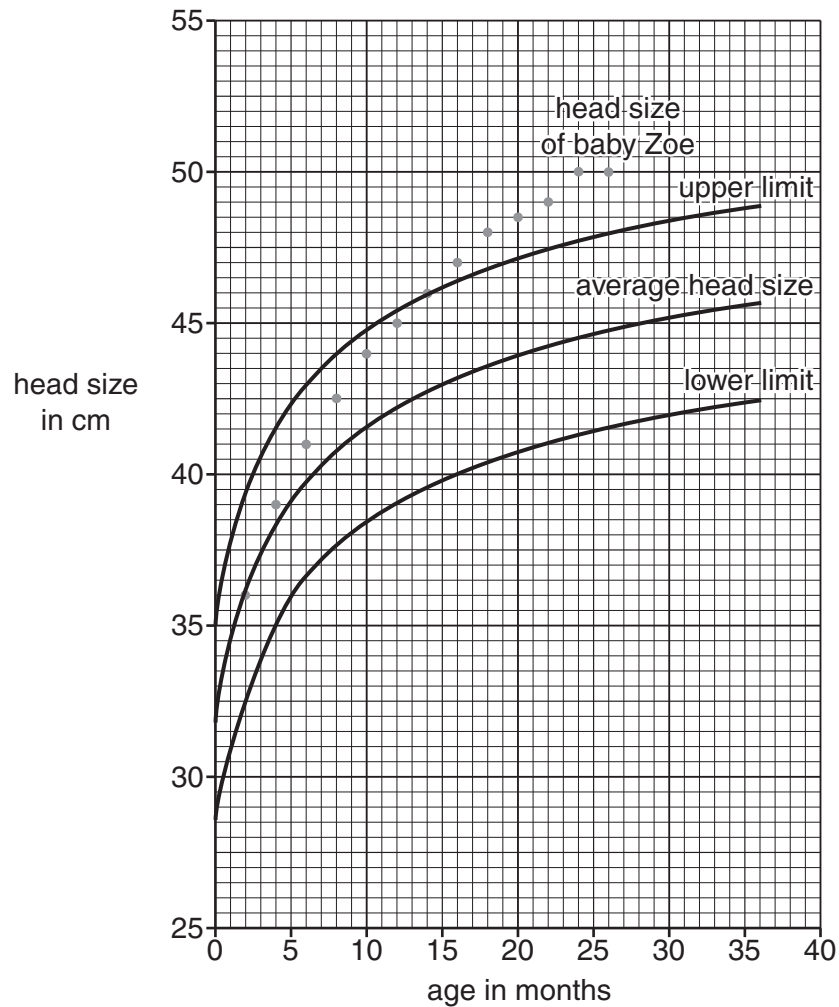
(b) Zoe is a baby girl.



A doctor measures her head size every two months from birth.

The doctor plots the measurements on a growth chart.

Look at the growth chart.



The chart shows the average head size for girls between birth and 36 months.

The upper and lower limits are shown for healthy girls between these ages.

(i) How old is Zoe when she reaches the upper limit for head size?

answer months [1]

(ii) Between 12 and 26 months Zoe's head size increases by 5 cm.

Calculate what percentage this is of Zoe's head size at 12 months old.

.....
.....
answer % [2]

(c) The doctor says that Zoe's increased head size is due to a mutation.

(i) What is a mutation?

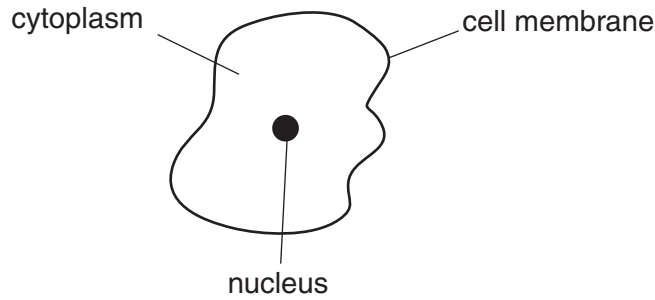
.....
..... [1]

(ii) What can cause a mutation to occur?

.....
..... [1]

[Total: 7]

10 The diagram shows a human cheek cell.



(a) (i) Write down **one** job of the cell membrane.

..... [1]

(ii) Look at the diagram.

Write down the name of the part of the cell where most chemical reactions occur.

..... [1]

(iii) The cheek cell needs glucose.

Blood carries glucose molecules to the cheek cell.

By what process do glucose molecules move from the blood into the cheek cell?

..... [1]

(b) The diagram shows a human sperm cell.



Explain how sperm cells are adapted for fertilisation.

In your answer include ideas about

- how the size of a sperm cell helps it to do its job
- how the parts of a sperm cell help it to do its job
- how the amount of sperm cells produced helps them to do their job.

..... [3]

11 This question is about plant growth.

Anita is a keen gardener.

She takes a cutting from her favourite plant.



(a) There are three stages in taking a cutting.

Write the numbers **1**, **2** and **3** in the boxes to show the correct order.

action	order
cut the stem at an angle	<input type="text"/>
put the cutting in a warm place	<input type="text"/>
choose a stem with a bud	<input type="text"/>

[2]

(b) Taking plant cuttings is a form of **cloning**.

Anita could produce more plants by growing them from seeds.

Write down **one** advantage of using cloning instead of using seeds.

.....
 [1]

(c) To help her plant cutting to grow roots, Anita puts rooting powder on the cutting.

What does rooting powder contain that helps cuttings grow roots?

..... [1]

(d) Anita's cutting grows into a new plant.

As the plant grows she needs to water it.

This is because plants lose water.

(i) Which part of the plant will lose most water?

..... [1]

(ii) Write down the word used to describe how water is lost from the plant.

..... [1]

(e) As the plant grows it makes new cells.

How are new cells made?

..... [1]

[Total: 7]

END OF QUESTION PAPER



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