

**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 13 January 2011
Morning**

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

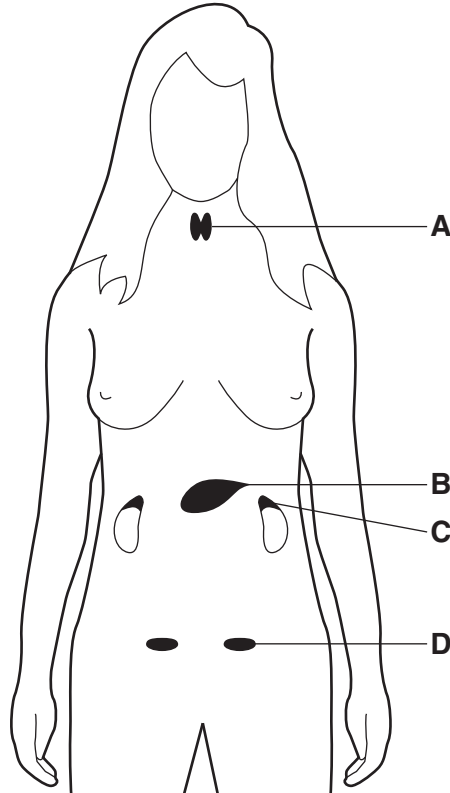
- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **60**.
- This document consists of **20** pages. Any blank pages are indicated.

Answer **all** the questions.

Section A – Module B1

1 (a) Look at the diagram.

It shows some of the organs in a female body that make hormones.



(i) Which organ is **only** found in the female body?

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

[1]

(ii) Organ **B** produces the hormone insulin.

Write down the name of organ **B**.

..... [1]

(b) Sex hormones cause secondary sexual characteristics in females.

One example is that periods start.

Write down **one other** example of a female secondary sexual characteristic.

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

(c) Hormones travel around the body.


How do hormones get from one organ to another?

..... [1]

(d) Nervous responses help control the body.

Some nervous responses are called reflex actions.

Read the information in the box.

<p>Cynthia steps on some broken glass.</p> <p>She lifts her foot very quickly.</p> <p>Her foot is cut but she only feels the pain after she lifts her foot.</p>	
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Lifting her foot is a reflex action.

Write down **two** things which show this is a reflex action.

1

.....

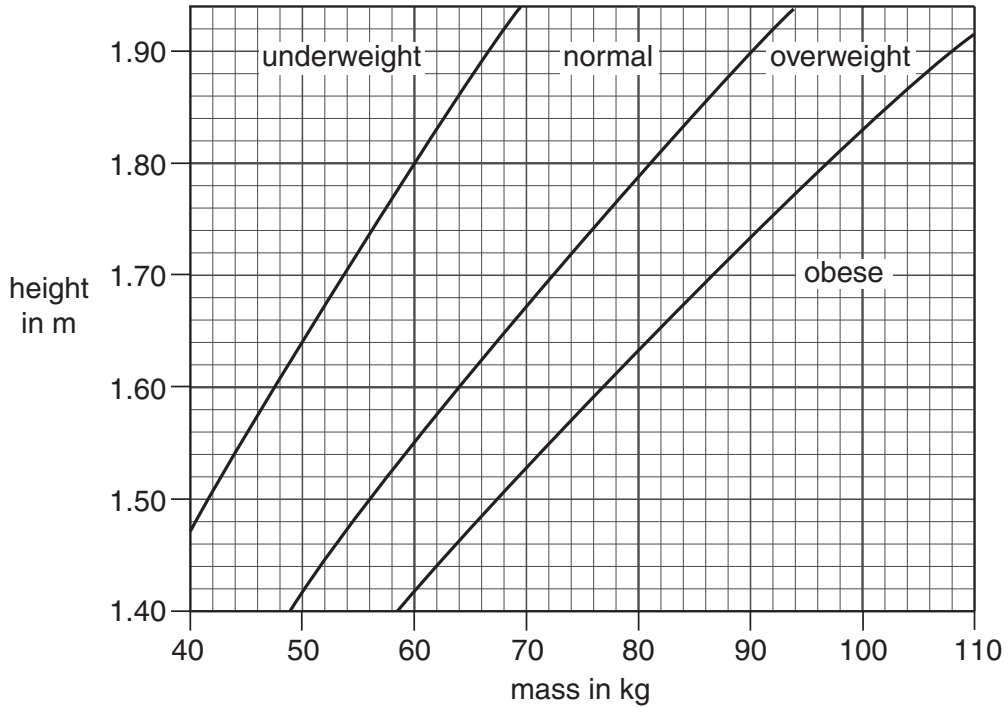
2

..... [2]

[Total: 6]

2 Jack thinks he is overweight.

He uses a BMI (Body Mass Index) chart to find out if he is overweight.



(a) Jack is 180 cm tall.

(i) Use the chart to suggest a normal mass for someone of Jack's height.

..... kg

[1]

(ii) Jack has a mass of 110 kg.

Calculate Jack's BMI.

Use the formula

$$\text{BMI} = \frac{\text{mass in kg}}{(\text{height in m})^2}$$

.....

BMI =

[2]

(b) Jack realises he needs to go on a low fat diet.

He finds out how much fat is in some foods.

The table shows the amount of fat in some foods.

food	fat in g per 100 g
bacon	12.0
bread	2.8
chips	11.5
ham	3.0
jacket potato	0.2

Which food contains the most fat per 100g?

..... [1]

(c) As part of his new healthy lifestyle Jack decides to drink less alcohol and stop smoking.

(i) Put a tick (✓) in the box next to **one long term** effect of alcohol.

athlete's foot

blurred vision

heat loss

liver damage

[1]

(ii) The epithelial cells in Jack's trachea are damaged by cigarette smoke.

Write down **one** way the cells are damaged.

.....

..... [1]

[Total: 6]

3 (a) The list shows examples of human characteristics and their causes.

Draw a **straight** line from each **characteristic** to its **cause**.

characteristic	cause
sickle cell anaemia	environment only
speaking English	genes only
intelligence	genes and the environment

[2]

(b) Genes control many characteristics in animals.

(i) Genes are part of chromosomes.

Which part of an animal cell contains chromosomes?

..... [1]

(ii) Elephant body cells each contain 28 **pairs** of chromosomes.

How many chromosomes are in an elephant's egg cell?

..... [1]

[Total: 4]

4 (a) Ravi has got mumps.

Mumps is an infectious disease.

Write about infectious diseases.

Your answer should include

- what causes infectious diseases
- which cells deal with the infection
- how these cells deal with the infection.

.....

.....

.....

..... [3]

(b) New treatments for infectious diseases are tested on animals.

The treatments are tested to see if they work.

Write down **one other** reason why they are tested.

..... [1]

[Total: 4]

Section B – Module B2

5 Look at the picture of a kestrel.



(a) Kestrels are **predators**.

Kestrels are adapted to feed on small mammals such as mice and voles.

What adaptations show that kestrels are predators?

Put ticks (✓) in the boxes next to the **two** correct adaptations.

eyes on the front of the head

lay eggs

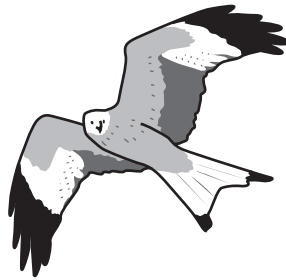
sharp claws

warm blooded

feathers

[2]

(b) Look at the picture of a red kite.



Red kites are **endangered**.

(i) Write down what endangered means.

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

(ii) One hundred years ago, only 10 breeding pairs were living in the UK.

The red kites were found only in Wales.

Suggest **two** ways in which humans caused red kites to be endangered in the UK.

1
2 [2]

(c) Scientists have successfully re-introduced red kites into England and Scotland.

There are now about 1000 breeding pairs in the UK.

Describe **how** red kites can be protected and encouraged to breed successfully.

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

[Total: 7]

6 (a) (i) Look at the pictures of animals.



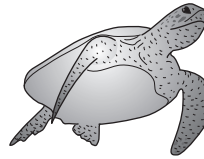
A



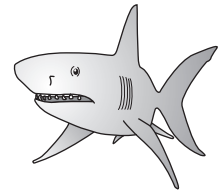
B



C



D



E

All these animals are **vertebrates** and have a backbone.

There are five groups of vertebrates.

Match each picture to the correct group.

Write **A**, **B**, **C**, **D** or **E** in each box.

amphibian

bird

fish

mammal

reptile

[2]

(ii) Many animals do **not** have backbones.

What scientific word describes animals that do **not** have backbones?

..... [1]

(b) Anna visits a rocky shore and notices there are many limpets on the rocks.



Limpets are animals that move very slowly when the tide is out.

Anna wants to estimate the number of limpets on the rocky shore.

She samples the limpets in ten different places using a quadrat.

Using a quadrat is a good choice.

Which **two** statements explain why?

- A** limpets live in the sea
- B** limpets move very slowly
- C** quadrats are square
- D** quadrats have an area of known size

Choose **two** from **A**, **B**, **C** and **D**.

..... and

[1]

(c) Anna collects some results to help with her estimate.

The table shows her results.

area of rocky shore	160m ²
size of quadrat used	0.25m ²
total number of limpets in 10 quadrats	40
average number of limpets in 1m ²	

(i) Calculate the average number of limpets in **1m²**.

.....

.....

.....

answer [2]

(ii) Use the results to estimate the number of limpets on the rocky shore.

.....

.....

answer [1]

[Total: 7]

7 Look at the picture.

It shows the remains of a plant leaf in a piece of rock.



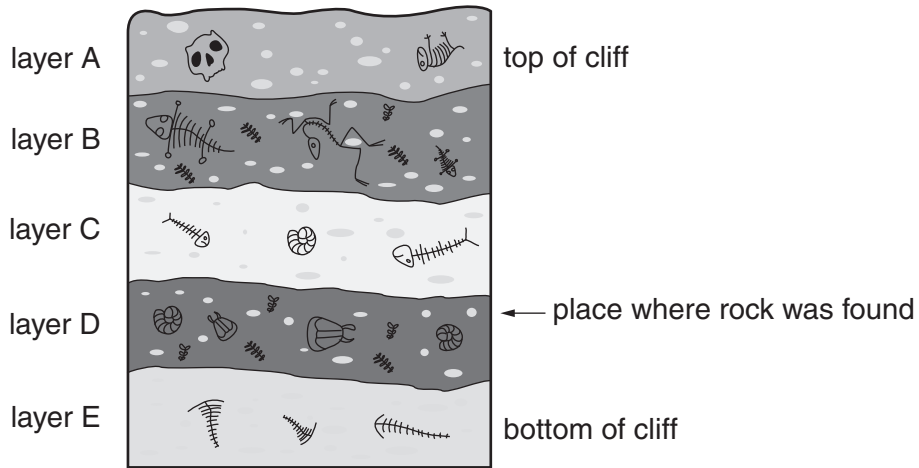
(a) (i) What name is given to remains of plants and animals from millions of years ago?
 [1]

(ii) The remains of this plant leaf have been preserved in rock.

Write down **one other** way that the remains of animals and plants from many years ago can be preserved.

..... [1]

(iii) The rock was found in a cliff face. Look at the diagram of the cliff face.



The rock was found in layer D.

Is this rock likely to be **older** or **younger** than rocks in layer B?

Put a tick (✓) in the box next to the correct answer and write down the reason why.

older younger

reason

..... [1]

(b) Plant leaves like the one found in the rock are adapted to photosynthesis.

Why do plants need to photosynthesise?

..... [1]

(c) The rock layers have different amounts of minerals.

Plants compete for minerals.

Write down **one other** thing that plants compete for.

..... [1]

(d) Scientists think that plant remains found in layer B and plant remains found in layer D belong to different species.

Suggest why.

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

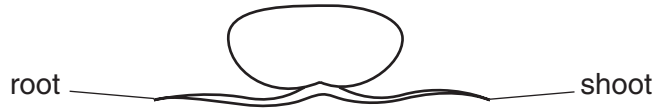
[Total: 6]

Section C – Module B3

8 (a) Peter is investigating how bean seeds grow.

He grows some seeds in damp cotton wool.

Look at one of his bean seeds.



How will the root and shoot change as they continue to grow?

In your answer include

- the **direction** that each grows in
- the **reason** each grows in that direction.

.....

.....

.....

..... [3]

(b) The growth of roots and shoots is controlled by chemicals called hormones.

Which of the following is also controlled by hormones?

Put a tick (✓) in the box next to the correct answer.

- | | |
|---------------------------------|--------------------------|
| flowers attracting insects | <input type="checkbox"/> |
| fruit ripening | <input type="checkbox"/> |
| leaves absorbing carbon dioxide | <input type="checkbox"/> |
| roots absorbing water | <input type="checkbox"/> |
| stems supporting plants | <input type="checkbox"/> |

[1]

(c) A farmer wants to improve his bean plants using selective breeding.

Look at the list of features.

Which **two** features should he select for?

Put ticks (✓) in the boxes next to the **two** best answers.

beans of uneven sizes

large number of beans per plant

leaves easily damaged by frost

plants resistant to disease

short roots

[2]

[Total: 6]

9 (a) Gill has two children, Jenny and Richard.

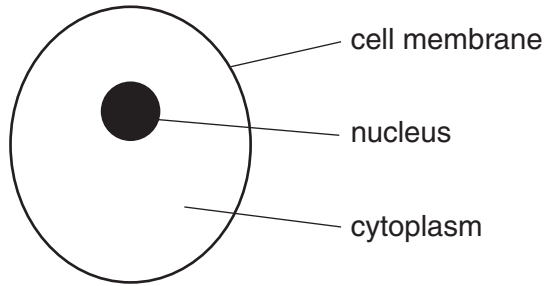
Gill has passed on genes to her children.

She passed on these genes in her egg cells.

(i) What chemical are genes made from?

..... [1]

(ii) Look at the diagram of an egg cell.



Write down **two** ways in which an egg cell is different from a sperm cell.

1

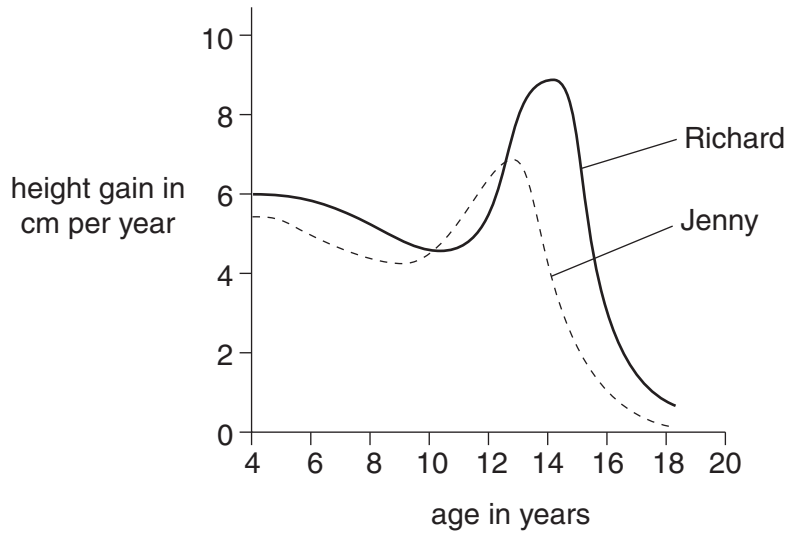
.....

2

..... [2]

(b) Look at the graph.

It shows how Jenny and Richard gain height as they grow.



Use the graph to answer the questions.

(i) At what **age** is Jenny growing at her fastest rate?

..... [1]

(ii) At what **age** does Richard **start** puberty?

..... [1]

(iii) Jenny reaches adulthood at 18 years.

What will then happen to Jenny's height?

..... [1]

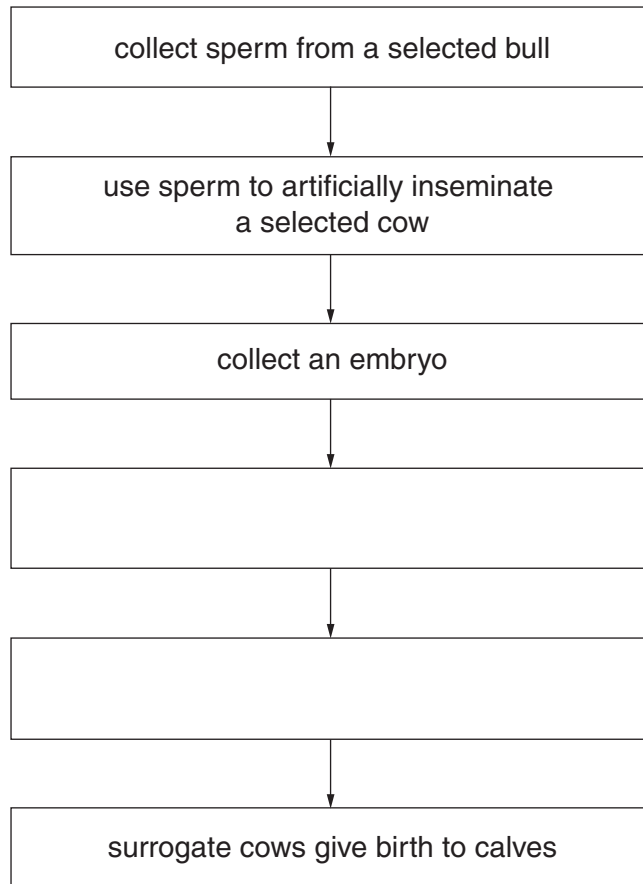
[Total: 6]

10 (a) A farmer wants to produce genetically identical calves.

He uses a technique called **embryo transplant**.

(i) Embryo transplant involves several stages.

Complete the flow diagram to show all the stages.



[2]

(ii) Embryo transplant has advantages compared with selective breeding.

One advantage of embryo transplant is that the new calves are genetically identical.

Suggest **one other** advantage of this technique.

.....

.....

..... [1]

(iii) What scientific word describes producing genetically identical animals?

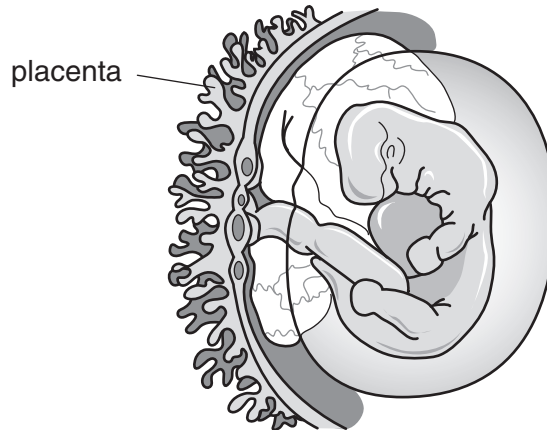
Choose your answer from the list.

Put a **ring** around the correct answer.

- cloning** **cutting** **fertilisation** **sexual reproduction** [1]

(b) Look at the diagram.

It shows a calf embryo inside a surrogate cow.



Different substances pass to and from the embryo through the placenta.

(i) Write down the name of **one** substance that passes **to** the embryo calf.

..... [1]

(ii) Write down the name of **one** substance that passes **from** the embryo calf.

..... [1]

(iii) How do these substances travel around the body of the embryo calf?

..... [1]

(c) All the new calves are genetically identical except for one which is a different colour from the others.

Suggest why this calf is different from the others.

..... [1]

[Total: 8]

END OF QUESTION PAPER

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