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GCSE

Biology A

Session: 2010 June
Type: Question paper
Code: J633
Units: A221; A222; A223

OCR
RECOGNISING ACHIEVEMENT

F

GENERAL CERTIFICATE OF SECONDARY EDUCATION

TWENTY FIRST CENTURY SCIENCE BIOLOGY A

A221/01

Unit 1: Modules B1 B2 B3 (Foundation Tier)

OCE/16245

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)

Friday 21 May 2010
Morning

Duration: 40 minutes

A221010

Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

INSTRUCTIONS TO CANDIDATES

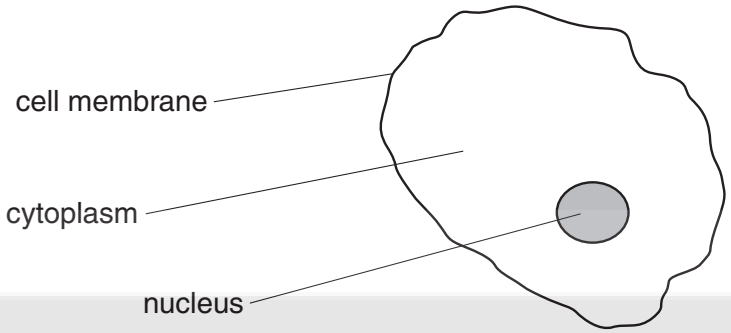
- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the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

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 **42**.
- This document consists of **16** pages. Any blank pages are indicated.

Answer **all** the questions.

1 Look at the diagram of a cell.



(a) Where are genes found in the cell?

Choose your answer from the labels on the diagram.

answer ..... **[1]**

(b) What is the job of genes?

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

to store glucose from digestion	☐
to describe how to make proteins	☐
to release energy by respiration	☐
to transport materials around the cell	☐

[1]

(c) Which statement best describes the structure of genes?

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

Genes are sections of ...

... very long DNA molecules that make up chromosomes.	☐
... very short DNA molecules that make up chromosomes.	☐
... very short chromosomes that make up DNA molecules.	☐
... very long chromosomes that make up DNA molecules.	☐

[1]

[Total: 3]

2 Human **body** cells have 46 chromosomes.

Chromosomes can replicate themselves.

(a) How many chromosomes are found in each human **sex** cell?

Put a (ring) around the correct answer.

1 **2** **23** **46** **92**

[1]

(b) Mary has cystic fibrosis.

Where did Mary get her alleles for cystic fibrosis from?

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

both from her mother ☐

both from her father ☐

neither from her mother nor her father ☐

one from her mother and one from her father ☐

[1]

(c) Neither Mary's mother nor father has cystic fibrosis.

Which statement is the best explanation for this?

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

Cystic fibrosis is caused by ...

... one dominant allele. ☐

... two dominant alleles. ☐

... one recessive allele. ☐

... two recessive alleles. ☐

... one dominant and one recessive allele. ☐

[1]

[Total: 3]

3 Genetic testing can be used to find the chances of a person developing certain conditions in the future.

Read these two people's views about this kind of genetic testing.

Amrit – an employee	**Raj – an employer**
	
I want to have a genetic test to see if I am at risk of getting cancer. Then I can make sure that my family will be prepared if anything happens to me. However, my employer wants to know the results of my tests. I do not want to tell him. If I am at risk of cancer he may sack me and I would lose my job and all my income.	I am pleased that Amrit wants to have the genetic test. But I think I have the right to know the result of the test. After all, if he is ill I will have to pay sickness pay and I may have to employ someone else to do his job. That is going to cost me a lot of money that my business cannot afford.

Summarise why Amrit and Raj have different views about the use of the genetic test results.

.....

.....

.....

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

[Total: 3]

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Question 4 starts on page 6

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4 Our body is sometimes invaded by microorganisms.

(a) White blood cells can destroy invading microorganisms.

Some of the statements about white blood cells are true. Some are not.

Put ticks (✓) in the boxes next to the **three** statements that are true.

White blood cells destroy microorganisms by ...

... using high frequency sound. ☐

... engulfing them. ☐

... drowning them. ☐

... digesting them. ☐

... making antibodies. ☐

... using an electrical impulse. ☐

... making antigens. ☐

... using high speed collisions. ☐

... injecting them with hormones. ☐ **[2]**

(b) Microorganisms can grow in the human body.

Which conditions inside the body help microorganisms to reproduce rapidly?

Put ticks (✓) in the boxes next to the **three** correct answers.

presence of nitrogen gas ☐

acidic ☐

cold ☐

wet ☐

presence of food ☐

dry ☐

warm ☐

presence of carbon dioxide ☐ **[3]**

(c) Our bodies have natural barriers to prevent microorganisms from entering our blood.

One natural barrier is the skin, which is a physical barrier.

Write down **three** other examples of these natural barriers and describe how they work.

.....

.....

.....

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

[Total: 8]

5 Steve is concerned about his heart. He wants to stay healthy.

(a) He makes a list of activities that could affect his health.

Put ticks (✓) in the boxes next to the **two** activities Steve should continue to do.

smoke cigarettes	☐
exercise regularly	☐
drink a lot of alcohol	☐
have a poor diet	☐
reduce his stress level	☐

[2]

(b) Fatty deposits could build up in Steve's blood vessels. This could produce a heart attack.

Read the sentences.

Put a (ring) around the correct choice in each sentence.

Blood is supplied to Steve's heart muscle cells through the coronary **artery** / **vein**.

Fat deposits in the blood vessels **increase** / **decrease** the blood supply to Steve's heart.

This means the muscle cells in Steve's heart get less **oxygen** / **carbon dioxide**.

This can cause cells in Steve's **lungs** / **heart** to die. **[2]**

(c) Steve wants to know if any other factors are a major cause of heart disease.

He makes a list of factors that he thinks might affect his chances of developing heart disease.

A I get lots of colds.

B I enjoy playing football.

C My father and grandfather both had heart attacks in their early forties.

D I only get about six hours sleep most nights.

Which of these are high risk or low risk factors in causing heart disease?

Write the letters **A**, **B**, **C** and **D** in the correct columns.

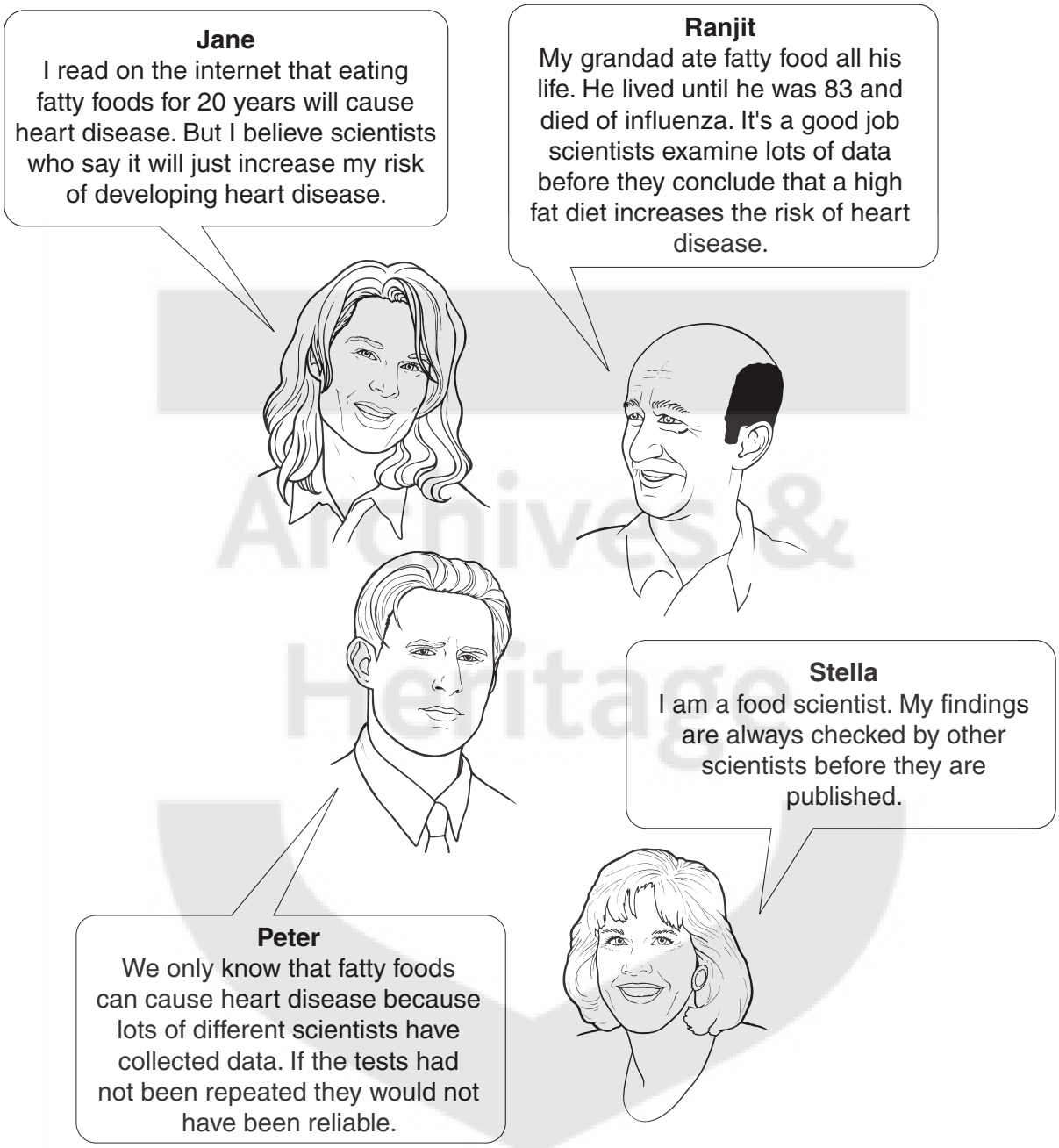
high risk	low risk

[2]

[Total: 6]

6 Eating a diet containing a lot of fatty food can increase the risk of getting heart disease.

Different people have different views about this.



To answer these questions you may use each person once, more than once, or not at all.

(a) Which person says that the absence of replication is a reason for questioning a scientific claim?

answer ..... **[1]**

(b) Which person is suggesting that individual cases do not provide convincing evidence for or against a **correlation**?

answer ..... **[1]**

(c) Which person is describing the process of peer review?

answer ..... **[1]**

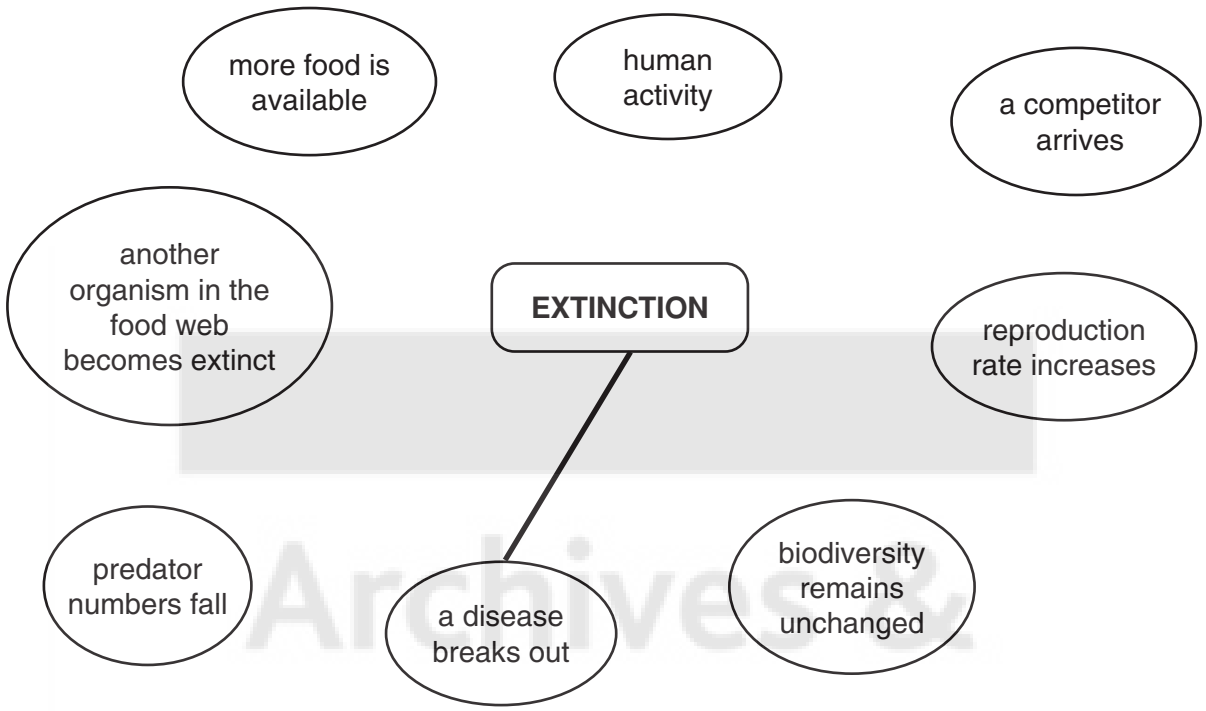
(d) Which **two** people are suggesting that factors might increase the chance of an outcome but not always lead to it?

answer ..... and ..... **[1]**

[Total: 4]

7 Wendy is revising for her exams.

She produces a mind map to help her revise about extinction.



Draw lines to connect the **four circles** containing correct reasons why extinction may happen, to the **EXTINCTION** box.

One of the four lines has been done for you. **[2]**

[Total: 2]

8 Scientists have gathered evidence to show that life on Earth evolved.

(a) Which statements provide evidence for evolution?

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

ancient manuscripts like the Dead Sea Scrolls	☐
stories passed down from one generation to the next	☐
the fossil record	☐
looking at how life evolved on other planets	☐
similarities and differences in DNA	☐
using the internet to research our ancestry	☐

[2]

(b) Read the sentences about evolution.

Put a (ring) around the correct choice in each sentence.

Evolution has happened over millions of years.

The first living things developed from molecules that **could** / **could not** copy themselves.

Most scientists think that evolution happens by **natural** / **unnatural** selection. **[1]**

(c) Many scientists think that the Earth may warm up in the future.

This is called climate change.

Suggest and **explain** how climate change could have an effect on evolution.

.....

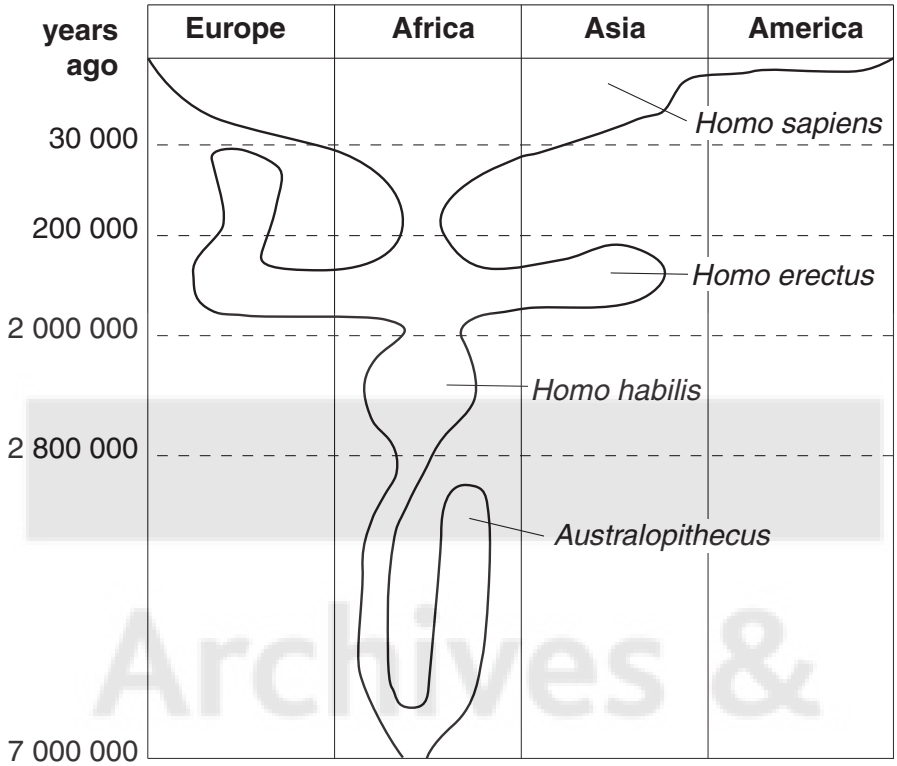
.....

.....

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

[Total: 5]

9 The chart shows the evolution of humans (*Homo sapiens*) over the last 7 million years.



(a) Neanderthals are another extinct relative of humans.

They did not evolve into *Homo sapiens*.

Neanderthals became extinct just over 30 000 years ago.

Shade in the part of the chart that represents the Neanderthals. **[1]**

(b) Use the chart to answer the questions.

(i) Which of these statements is true?

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

All the species named on the chart evolved from a common ancestor. ☐

Only one of the species evolved from a common ancestor. ☐

Australopithecus evolved from *Homo habilis*. ☐

None of the species evolved from a common ancestor. ☐

Homo erectus was mainly found in America. ☐

[1]

(ii) Which process is shown by the chart?

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

The chart shows ...

... central evolution. ☐

... convergent evolution. ☐

... divergent evolution. ☐

... negative evolution. ☐ **[1]**

(iii) Name one species shown on the chart that is not yet extinct.

answer ..... **[1]**

(c) Explain how changes to the brain influenced human evolution.

.....

.....

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

(d) Ideas about evolution have changed with time.

Darwin produced data to back up his theory of evolution by natural selection.

This data conflicted with the old explanations that many scientists believed.

Even so, scientists were still reluctant to give up these old explanations.

Suggest **two** reasons why scientists involved in a scientific issue may disagree.

.....

.....

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

[Total: 8]

END OF QUESTION PAPER

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OCR
RECOGNISING ACHIEVEMENT

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GENERAL CERTIFICATE OF SECONDARY EDUCATION

TWENTY FIRST CENTURY SCIENCE BIOLOGY A

A221/02

Unit 1: Modules B1 B2 B3 (Higher 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)

Friday 21 May 2010
Morning

Duration: 40 minutes

Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

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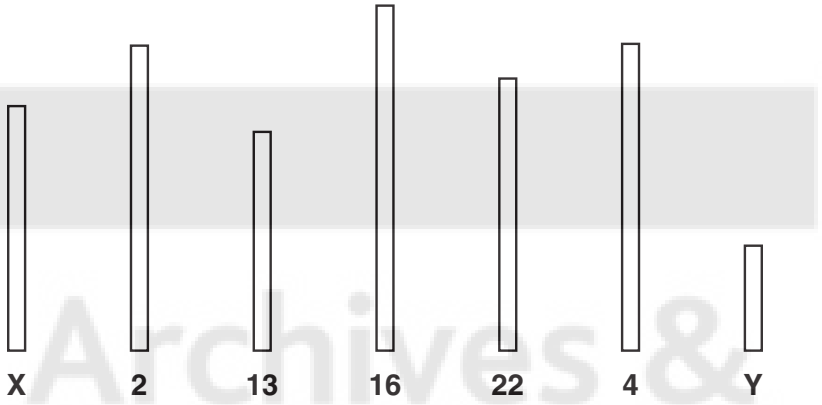
1 Look at the diagrams of some different chromosomes taken from a human cell.

Each chromosome is given a number or a letter.

A gene on one chromosome is responsible for determining the sex of an embryo.

(a) Put a (ring) around this chromosome.



[1]

(b) Explain the role of this gene in determining sex.

.....

.....

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

(c) Which human feature is determined by several genes working together?

Put a (ring) around the correct answer.

broken leg **cystic fibrosis** **height** **Huntington's disorder**

[1]

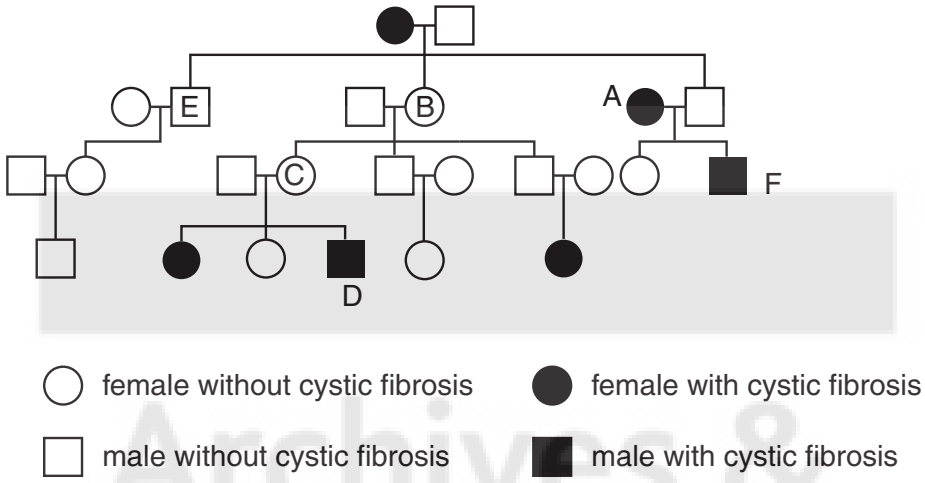
[Total: 3]

2 Mary has cystic fibrosis. She has alleles for cystic fibrosis.

(a) Where did Mary get her alleles from?

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

(b) The family tree shows the inheritance of cystic fibrosis.



(i) Put a ring around the correct answer.

The allele that causes cystic fibrosis is described as ...

co-dominant **dominant** **normal** **recessive**

[1]

(ii) Which person, **A**, **B**, **C**, **D**, **E** or **F**, is a female who has inherited two cystic fibrosis alleles?

answer ..... **[1]**

(iii) Which **three** people from **A**, **B**, **C**, **D**, **E** and **F** are carriers?

answer ..... **[1]**

(iv) Person **E** has a daughter.

We cannot tell from the family tree if the daughter is a carrier.

Explain why.

.....

.....

.....

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

[Total: 7]

3 Amrit and Raj are thinking about genetic testing.

Amrit – an employee	**Raj – an employer**
	
Raj, my boss wants me to have a genetic test. I am not sure that it is a good idea.	I want Amrit to have a genetic test as part of a genetic screening programme for all my employees.

Genetic testing can be used to find the chances of a person developing certain conditions in the future.

(a) Explain why Amrit may not want to have the genetic test.

.....

.....

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

(b) Explain why Raj wants to carry out a genetic screening programme.

.....

.....

.....

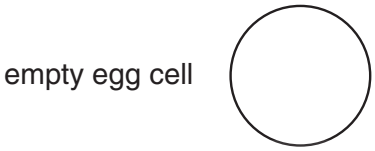
..... **[2]**

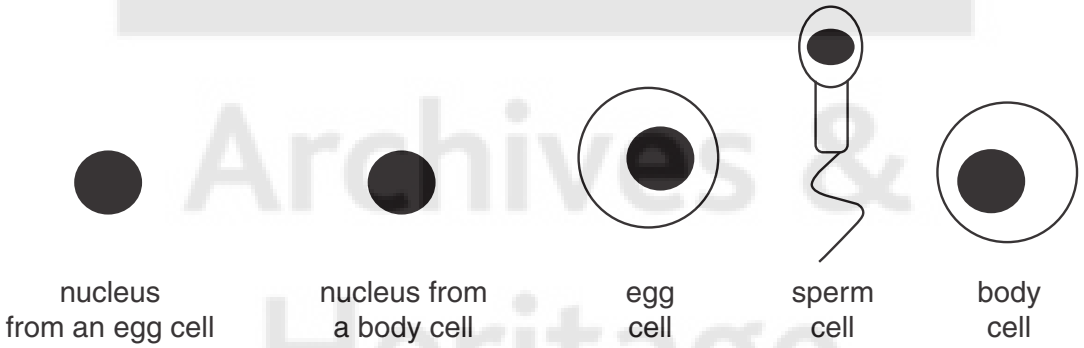
[Total: 4]

4 Clones can be produced artificially.

(a) Look at the diagram of an empty egg cell.

Draw a straight line from the empty egg cell to the structure that you would add to the egg cell to make a clone.





[1]

(b) Which are examples of natural clones?

Put ticks (✓) in the boxes next to the correct answers.

two plants made by asexual reproduction from the same parent	☐
two photocopies of a picture	☐
two bacteria produced from one bacterium	☐
an artist's drawing of two identical flowers	☐
identical twins	☐
two sperm cells from the same man	☐

[2]

(c) Clones can look different.

Which factors can cause clones to look different?

Put a (ring) around the correct answer.

genetic factors only	**environmental factors only**	**both genetic and environmental factors**	**neither genetic nor environmental factors**

[1]

(d) Embryonic stem cells can be obtained from embryos.

Which of the statements about **embryonic stems cells** are true?

Put ticks (✓) in the boxes next to the correct answers.

Embryonic stem cells ...

… are unspecialised cells that can develop into any type of cell. ☐

… are unspecialised cells that cannot develop into any type of cell. ☐

… could potentially be used to treat some diseases. ☐

… can be used to grow different species of animals and plants. ☐

… are specialised cells that can develop into any type of cell. ☐

… are specialised cells that cannot develop into any type of cell. ☐

[2]

[Total: 6]

5 Our bodies are sometimes invaded by microorganisms.

(a) We can protect ourselves by having a vaccination containing dead microorganisms.

Some of the statements describe how vaccination helps to protect us from disease-causing microorganisms.

They are in the wrong order.

Use **only** the correct statements and place them in their correct order.

The first one has been done for you.

A Antibodies destroy the disease-causing microorganism.

B White blood cells produce lots of antigens.

C Our body rapidly makes antibodies to the disease.

D Our body slowly makes antibodies to the disease.

E The disease-causing microorganism enters the body.

F The disease releases antibodies into our blood.

G We receive a vaccination against the disease.

G				

[3]

(b) Which statement best explains why it is difficult to develop a vaccine against HIV?

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

HIV damages the ...

… hormonal system and has a high mutation rate. ☐

… hormonal system and has a low mutation rate. ☐

… immune system and has a high mutation rate. ☐

… immune system and has a low mutation rate. ☐

… nervous system and has a high mutation rate. ☐

… nervous system and has a low mutation rate. ☐

… reproductive system and has a high mutation rate. ☐

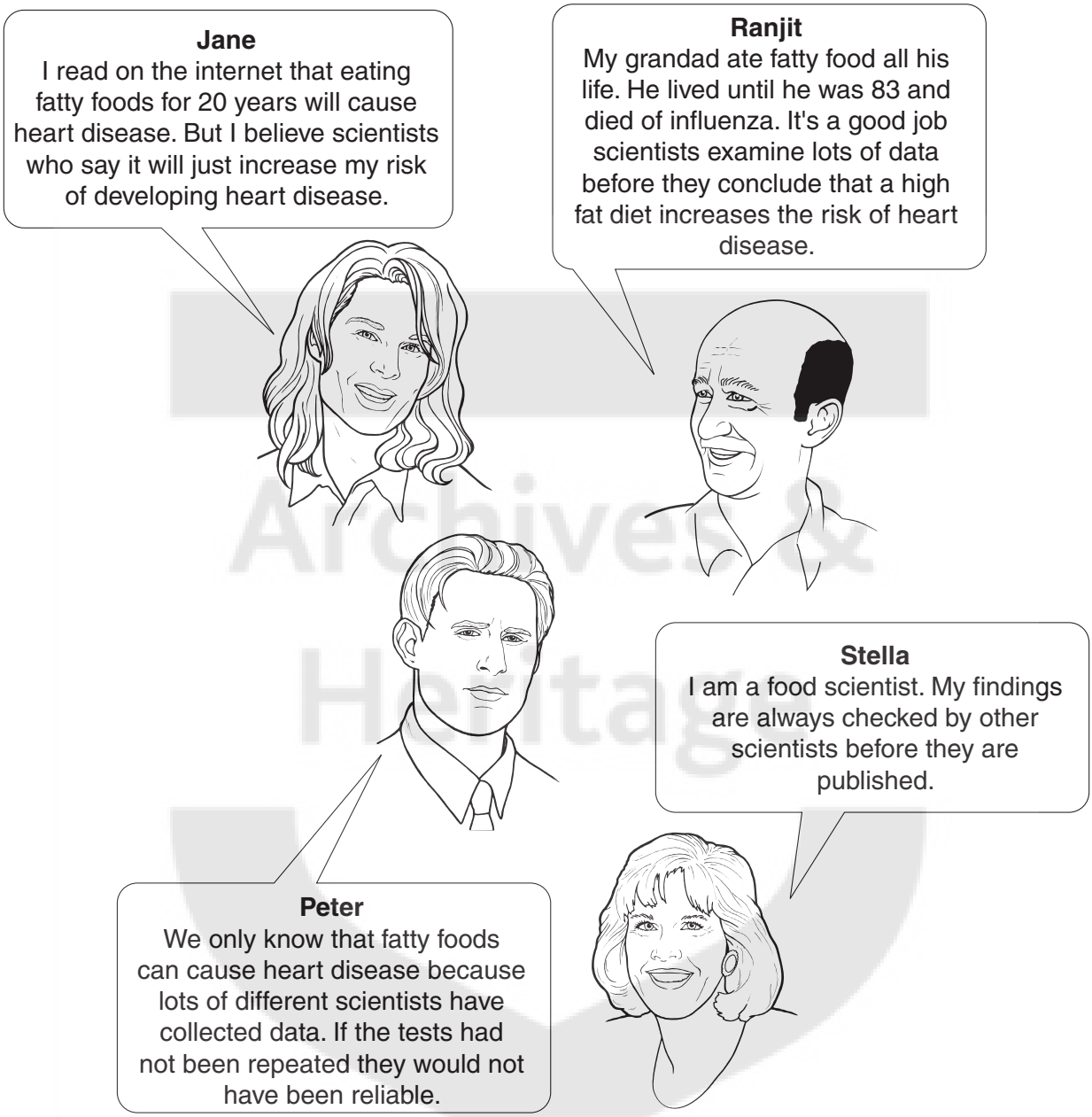
… reproductive system and has a low mutation rate. ☐

[1]

[Total: 4]

6 Eating a diet containing a lot of fatty food can increase the risk of getting heart disease.

Different people have different views about this.



To answer these questions you may use each person once, more than once, or not at all.

(a) Which person says that the absence of replication is a reason for questioning a scientific claim?

answer ..... **[1]**

(b) Which person is suggesting that individual cases do not provide convincing evidence for or against a **correlation**?

answer ..... **[1]**

(c) Which person is describing the process of peer review?

answer ..... **[1]**

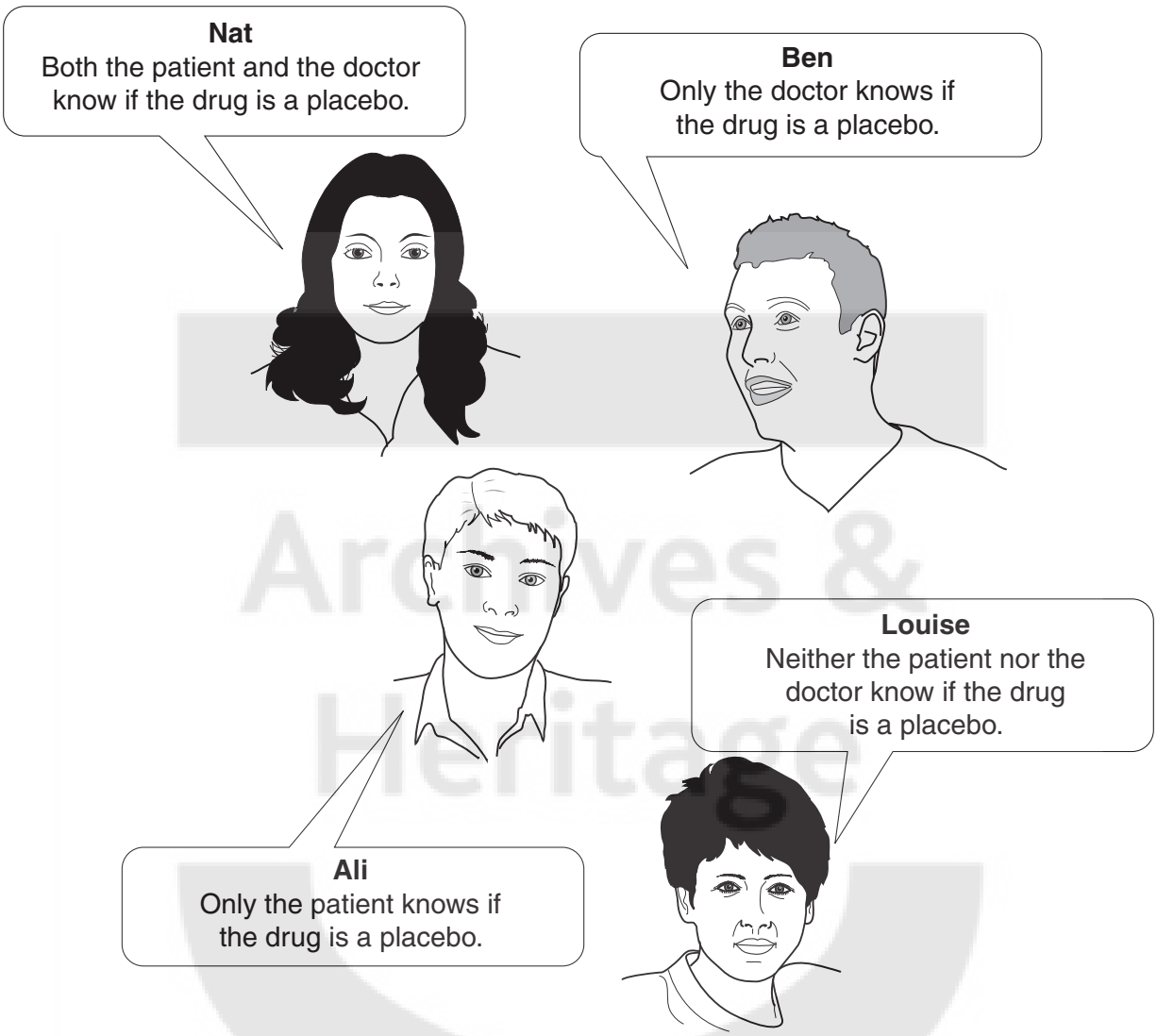
(d) Which **two** people are suggesting that factors might increase the chance of an outcome but not always lead to it?

answer ..... and ..... **[1]**

[Total: 4]

7 New drugs are tested using **blind** or **double-blind** trials.

(a) These people are talking about blind and double-blind trials.



Which person is correctly describing ...

... a **blind** drugs trial?

answer .....

... a **double-blind** drugs trial?

answer .....

[1]

(b) Write about placebos.

Your answer should include

- what they are
- why they are used
- when they should not be used.

.....

.....

.....

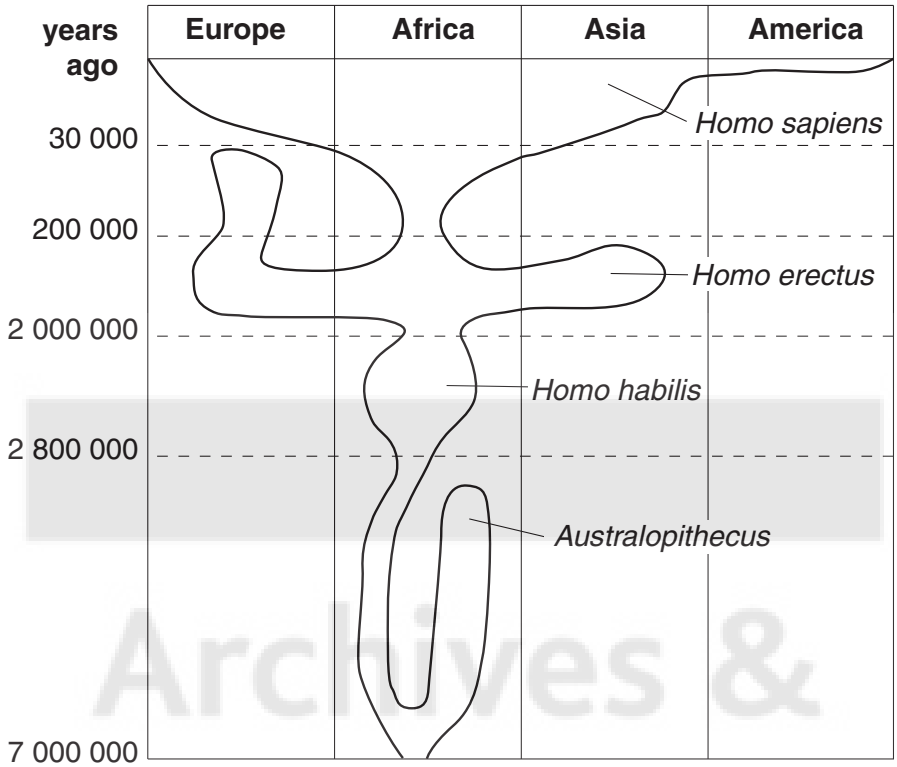
.....

.....

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

[Total: 4]

8 The chart shows the evolution of humans (*Homo sapiens*) over the last 7 million years.



(a) Neanderthals are another extinct relative of humans.

They did not evolve into *Homo sapiens*.

Neanderthals became extinct just over 30 000 years ago.

Shade in the part of the chart that represents the Neanderthals. **[1]**

(b) Use the chart to answer the questions.

(i) Which of these statements is true?

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

All the species named on the chart evolved from a common ancestor. ☐

Only one of the species evolved from a common ancestor. ☐

Australopithecus evolved from *Homo habilis*. ☐

None of the species evolved from a common ancestor. ☐

Homo erectus was mainly found in America. ☐

[1]

(ii) Which process is shown by the chart?

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

The chart shows ...

... central evolution. ☐

... convergent evolution. ☐

... divergent evolution. ☐

... negative evolution. ☐ **[1]**

(iii) Name **one** species shown on the chart that is not yet extinct.

answer ..... **[1]**

(c) Explain how changes to the brain influenced human evolution.

.....

.....

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

(d) Ideas about evolution have changed with time.

Darwin produced data to back up his theory of evolution by natural selection.

This data conflicted with the old explanations that many scientists believed.

Even so, scientists were still reluctant to give up these old explanations.

Suggest **two** reasons why scientists involved in a scientific issue may disagree.

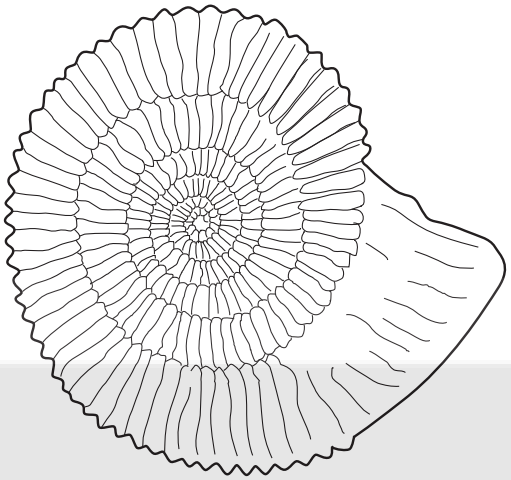
.....

.....

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

[Total: 8]

9 The fossil record has been put forward as evidence for the theory of evolution by natural selection.



What conclusions can be made from this evidence?

Put ticks (✓) in the boxes next to the correct conclusions.

It proves the theory of evolution is correct.	☐
It increases our confidence in the theory but does not prove that it is correct.	☐
It makes no difference to our belief in the theory of evolution.	☐
It decreases our confidence in the theory but does not prove that it is wrong.	☐
It agrees with other data to support the theory of evolution.	☐
It disagrees with other data that support the theory of evolution.	☐

[2]

[Total: 2]

END OF QUESTION PAPER

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GENERAL CERTIFICATE OF SECONDARY EDUCATION

TWENTY FIRST CENTURY SCIENCE BIOLOGY A

A222/01

Unit 2: Modules B4 B5 B6 (Foundation Tier)

OCE/16229

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)

Tuesday 22 June 2010
Morning

Duration: 40 minutes

A222201

Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

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Answer **all** the questions.

1 This question is about enzymes.

(a) What are enzymes?

In your answer you should include

- what type of chemical they are
- what they do.

.....

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

(b) Enzymes and some molecules fit together.

Which model is used to explain this?

Put a (ring) around the correct answer.

enzyme and molecule model **lock and key model** **puzzle shape model**

[1]

(c) The frequency of collisions between an enzyme and other molecules can increase.

(i) Which factor can cause this increase?

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

light ☐

pH ☐

temperature ☐

[1]

(ii) Complete this sentence.

When the frequency of collisions increases, the rate of reaction will ..... .

[1]

[Total: 5]

2 Blood flows through the kidneys.

(a) As the blood flows through the kidneys, chemicals are filtered out of the blood.

Some of these chemicals are **completely reabsorbed** back into the blood.

Some are **partly reabsorbed** by the body.

Others are **not reabsorbed**.

Put one tick (✓) in the **correct box** for each chemical.

chemical	completely reabsorbed	partly reabsorbed	not reabsorbed
water			
sugar			
urea			

[3]

(b) How does drinking alcohol affect water balance in the body?

In your answer write about the effects on:

- the volume of urine produced
- the concentration of urine produced
- the water level in the body.

.....

.....

.....

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

[Total: 6]

3 Andy goes out in cold weather.

(a) Andy's internal body temperature stays at 37 °C.

This is an example of homeostasis.

(i) What is **homeostasis**?

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

(ii) What should happen to energy **gain** and energy **loss** to keep Andy's body temperature at 37 °C?

.....

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

(b) Complete the sentences about body temperature.

Choose words from this list.

brain

effectors

neurons

receptors

skin

spinal cord

The external temperature is detected by the .....

in the ..... .

The temperature of the blood is detected in the ..... . **[3]**

(c) Andy's muscles produce heat.

Which process in Andy's muscles produces heat?

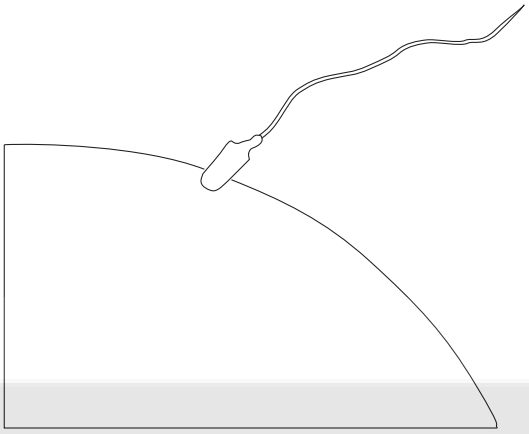
Put a (ring) around the correct answer.

breathing **diffusion** **digestion** **respiration**

[1]

[Total: 6]

4 This question is about dividing cells.



(a) A sperm and an egg fuse together to form a zygote.

The zygote then divides to form an embryo.

The cells in the embryo go through a number of stages called the **cell cycle**.

Complete the sentences about the cell cycle.

Choose words from this list.

decreases

DNA

hormone

increases

protein

stays the same

As each cell grows, the number of organelles ..... .

The chromosomes are copied by separating the strands of ..... . **[2]**

(b) Most human cells have 46 chromosomes.

How many chromosomes does a sperm cell contain?

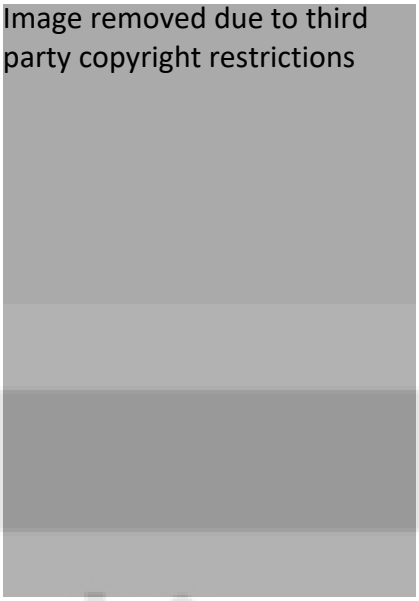
Put a (ring) around the correct answer.

2 **23** **46** **69** **92**

[1]

[Total: 3]

5 The General Sherman tree in Sequoia National Park in the USA is the largest tree in the world.



During growth, the cells in this tree have specialised to form different types.

All the cells in the tree contain the same genes.

(a) How does cell specialisation take place?

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

All the genes in every cell remain active. ☐

All the genes in every cell become inactive. ☐

Only some of the genes in each cell remain active. ☐

The number of genes in each cell changes. ☐

[1]

(b) It is possible to grow new trees from **cuttings** taken from this large tree.

Cut stems are dipped into a powder to grow new roots.

What should this powder contain?

Put a (ring) around the correct answer.

enzymes **fertiliser** **genes** **hormones**

[1]

(c) Which two features are found in both plants and animals?

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

Both plants and animals ...

... have specialised cells. ☐

... have tissues including xylem and phloem. ☐

... grow in height and width all through their lives. ☐

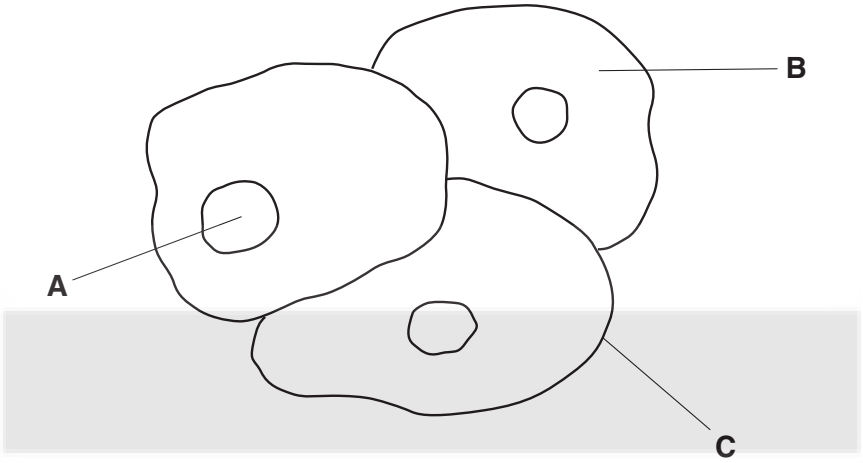
... have cells that make specific proteins that they need. ☐

[1]

[Total: 3]

6 Alan uses a microscope to study cells.

He looks at some human cheek cells.



(a) Complete the table to match each **description** with the correct **label**.

Write the correct letter, **A**, **B** or **C**, in each row.

description	label
where the genetic code is found	
where proteins are made	

[1]

(b) The growth and development of each cell is controlled by its DNA.

What are the features of DNA?

Put a (ring) around the correct answer in each row.

DNA feature				
number of strands	**1**	**2**	**3**	**4**
number of different types of bases	**2**	**3**	**4**	**5**
arrangement of bases between the strands	**single**	**pairs**	**triplets**	**fours**
shape of molecule	**circular**	**cubic**	**helix**	**zig-zag**

[3]

[Total: 4]

7 Ellie is learning French at school.

She is trying to remember the French word for 'please'.

(a) Which part of Ellie's body is responsible for memory?

Put a (ring) around the correct answer.

brain

effectors

spinal cord

[1]

(b) What is memory?

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

Memory is the …

… ability to link together previous experiences. ☐

… response to a stimulus. ☐

… storage and retrieval of information. ☐

… transmission of impulses across a synapse. ☐

[1]

(c) What does Ellie's verbal memory consist of?

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

long-term memory only ☐

short-term and long-term memory ☐

short-term memory only ☐

neither long-term nor short-term memory ☐

[1]

(d) Ellie will remember her French words by the process of **learning**.

Complete the sentences about learning and neuron pathways.

Choose words from this list.

bones

brain

kidneys

new

old

similar

During human development neuron pathways form in the ..... .

Learning causes some pathways to be used more often.

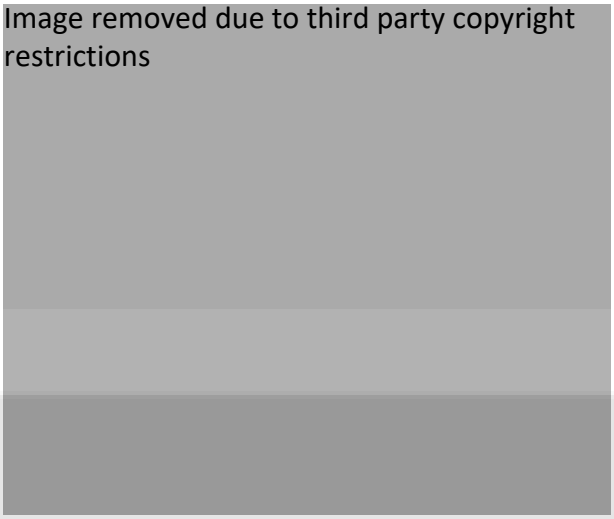
The number of potential pathways formed allows the human to adapt to

..... situations.

[1]

[Total: 4]

8 The sea anemone is an animal which lives in rock pools.



It is attached to the rocks.

It survives by using simple reflexes.

(a) The sea anemone pulls its tentacles into its body when a shadow appears over the rock pool.

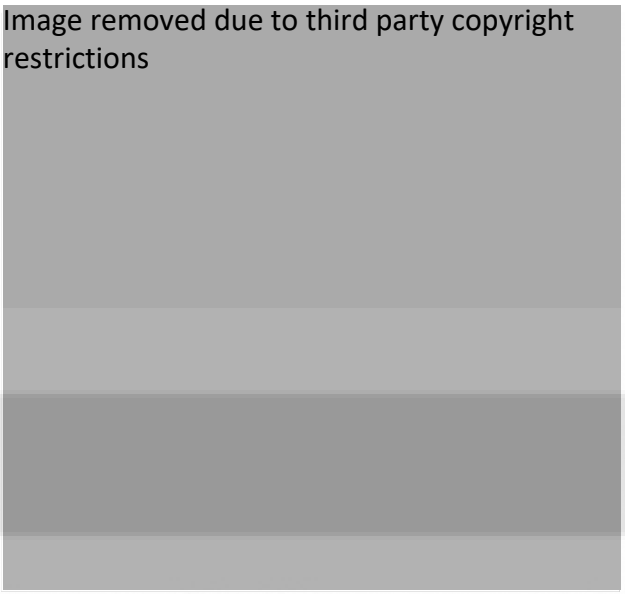
How does this help it to survive?

.....

.....

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

(b) Simple reflexes are also found in human babies.



Describe **two** examples of simple reflexes in newborn babies.

.....

.....

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

(c) Human babies have a central nervous system.

The sea anemone does not have a central nervous system.

Which two structures are found in the central nervous system?

Put a (ring) around the **two** correct answers.

brain

effectors

muscles

receptors

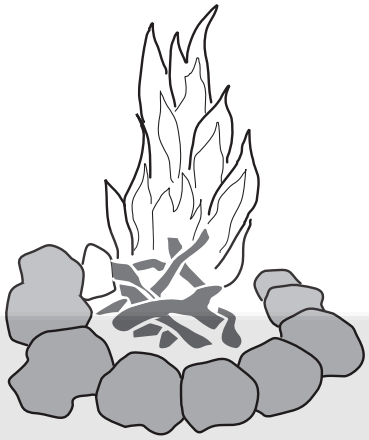
spinal cord

[2]

[Total: 5]

9 Tom is enjoying his camping holiday.

He sits by a camp fire.



(a) Complete the sentences.

Choose words from this list.

effectors

heat

light

motor

receptors

sensory

sound

Tom can see the flames of the fire.

The receptor cells in the retina of the eye are stimulated by ..... .

Impulses are carried from the eye to the brain by ..... neurons. **[1]**

(b) A spark from the fire lands on his hand.

Tom jumps.

He then decides to move farther away from the fire.

Use this example to explain the difference between voluntary and involuntary responses.

.....

.....

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

(c) Some neurons have long fibres called axons.

(i) What surrounds the axon?

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

chloroplast ☐

membrane ☐

vacuole ☐

cell wall ☐

[1]

(ii) The axon of some neurons is also surrounded by a fatty sheath.

Describe **two** functions of the fatty sheath.

.....

.....

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

[Total: 6]

END OF QUESTION PAPER

PLEASE DO NOT WRITE ON THIS PAGE

OCR
RECOGNISING ACHIEVEMENT

H

GENERAL CERTIFICATE OF SECONDARY EDUCATION

TWENTY FIRST CENTURY SCIENCE BIOLOGY A

A222/02

Unit 2: Modules B4 B5 B6 (Higher 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)

Tuesday 22 June 2010
Morning

Duration: 40 minutes

Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use 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.
- 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).

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 **42**.
- This document consists of **16** pages. Any blank pages are indicated.

Answer **all** the questions.

1 Andy goes out in cold weather.

(a) Andy's internal body temperature stays at 37 °C.

This is an example of homeostasis.

(i) What is **homeostasis**?

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

(ii) What should happen to energy **gain** and energy **loss** to keep Andy's body temperature at 37 °C?

.....

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

(b) Complete the sentences about body temperature.

Choose words from this list.

brain

effectors

neurons

receptors

skin

spinal cord

The external temperature is detected by the .....

in the ..... .

The temperature of the blood is detected in the ..... . **[3]**

(c) Andy's muscles produce heat.

Which process in Andy's muscles produces heat?

Put a (ring) around the correct answer.

breathing **diffusion** **digestion** **respiration**

[1]

[Total: 6]

2 This question is about control systems.

(a) Doctors may use artificial control systems to help patients.

One example is using an artificial control system to maintain a patient's blood oxygen levels.

The artificial control system is designed to act like different parts of the body.

Draw a straight line from each **function** of the artificial control system to the **part of the body** that it acts like.

function	part of the body
detects any change in blood oxygen levels	processing centre in the brain
receives information about blood oxygen levels	receptors
adds more or less oxygen to the blood	effectors

[1]

(b) Negative feedback takes place in both artificial and body systems.

What are the characteristics of a **negative feedback** system?

.....

.....

.....

.....

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

[Total: 4]

3 Sharveena drinks a glass of water.

(a) In what other ways can Sharveena gain water?

Put a (ring) around the **two** correct answers.

breathing

eating food

excreting urine

producing faeces

respiring

sweating

[2]

(b) The concentration of Sharveena's urine is controlled by the hormone ADH.

(i) Which part of her brain **releases** ADH into the bloodstream?

Put a (ring) around the correct answer.

cerebral cortex

hypothalamus

pituitary gland

synapse

[1]

(ii) Sharveena drinks another glass of water.

How does ADH help to control the balance of water in Sharveena's body?

.....

.....

.....

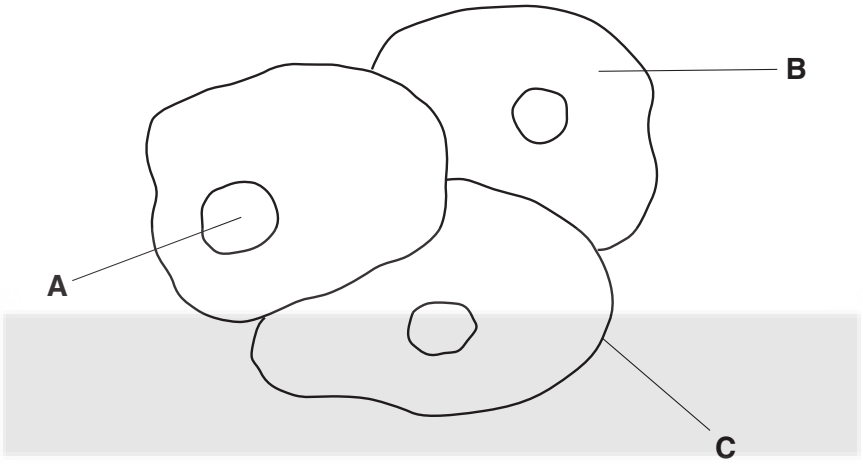
.....

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

[Total: 6]

4 Alan uses a microscope to study cells.

He looks at some human cheek cells.



(a) Complete the table to match each **description** with the correct **label**.

Write the correct letter, **A**, **B** or **C**, in each row.

description	label
where the genetic code is found	
where proteins are made	

[1]

(b) The growth and development of each cell is controlled by its DNA.

What are the features of DNA?

Put a (ring) around the correct answer in each row.

DNA feature				
number of strands	**1**	**2**	**3**	**4**
number of different types of bases	**2**	**3**	**4**	**5**
arrangement of bases between the strands	**single**	**pairs**	**triplets**	**fours**
shape of molecule	**circular**	**cubic**	**helix**	**zig-zag**

[3]

[Total : 4]

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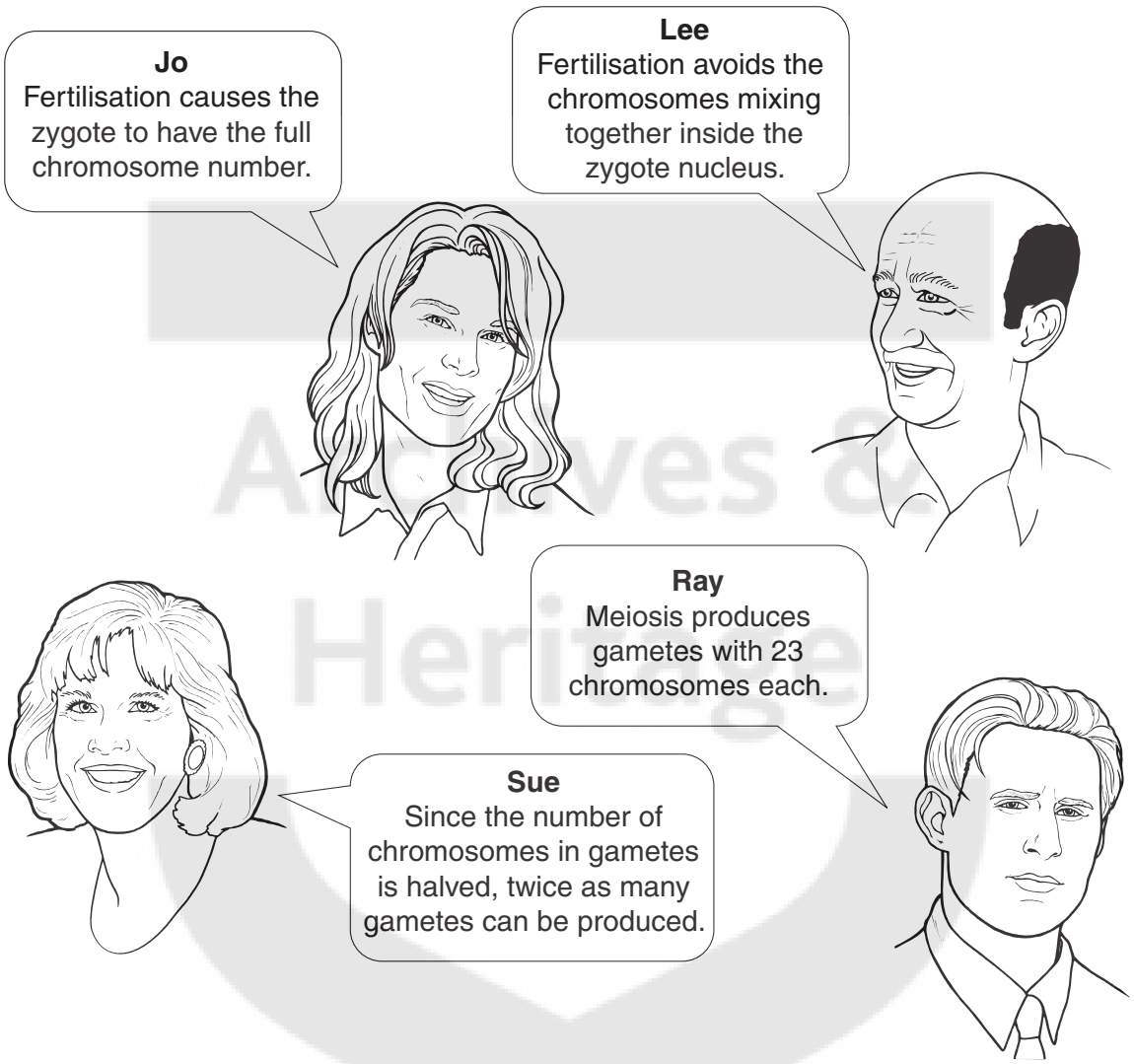
PLEASE DO NOT WRITE ON THIS PAGE

Question 5 starts on page 8

5 Fertilisation in humans involves the fusion of gametes or sex cells to form a zygote with 46 chromosomes.

(a) Meiosis occurs during the formation of gametes.

Four people try to explain the link between meiosis and fertilisation.



Which **two** people's ideas, when put together, give the best explanation of the link between meiosis and fertilisation?

answer ..... and ..... **[1]**

(b) The parent cells used to form the gametes are different from the zygote that is produced after fertilisation.

Why is this?

.....

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

(c) The human zygote develops into an embryo.

Each cell in the embryo completes the **cell cycle**.

(i) Complete the sentences about the cell cycle.

Choose words from this list.

chromosomes

eight

nuclei

organelles

sixteen

thirty two

As each cell grows before mitosis it contains an increased

number of ..... .

Every cell in the embryo has the potential to produce any sort of cell, up to the

..... cell stage.

[2]

(ii) Cells in the embryo become specialised.

What are the results of this change?

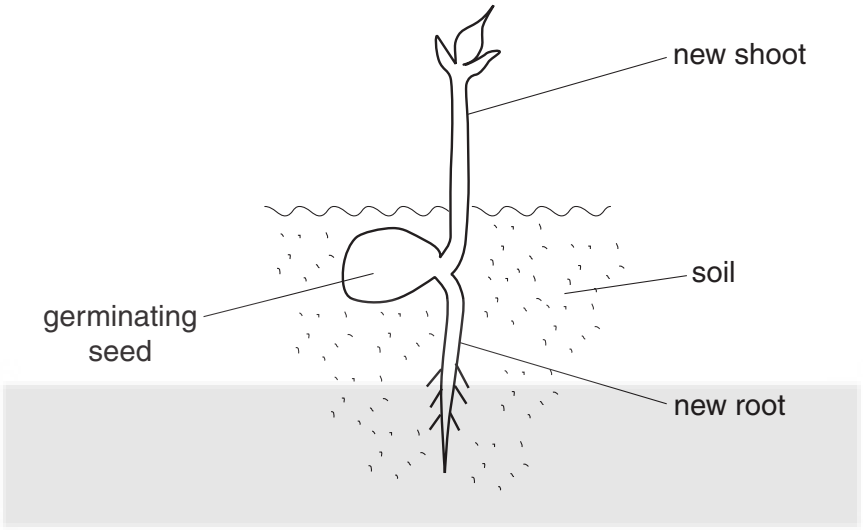
Put a tick (✓) in each row to show whether each statement is true or false.

	true	**false**
The cells no longer contain the same genes.		
Some of the genes are no longer active.		
Each cell produces only the specific proteins it needs.		
The cells form different types of tissues.		

[2]

[Total: 6]

6 David grows a seedling for an experiment.



(a) The shoot and root both increase in length.

Which part of the seedling causes this increase?

Put a (ring) around the correct answer.

meristem

phloem

root hair

xylem

[1]

(b) David allows the seedling to grow into a large plant.

He cuts a shoot from the large plant.

He dips the cut end of the shoot into a rooting powder.

What must the powder contain?

Put a (ring) around the correct answer.

antibodies **antigens** **antiserum** **auxin**

[1]

(c) The cutting is a clone.

What happens as clones grow?

Complete the sentences.

Choose words from this list.

cell walls

chromosomes

doubles

genes

halves

phloem

specialised

stays the same

unspecialised

xylem

The chromosome number in each cell ..... .

In plants, new xylem cells develop from ..... cells.

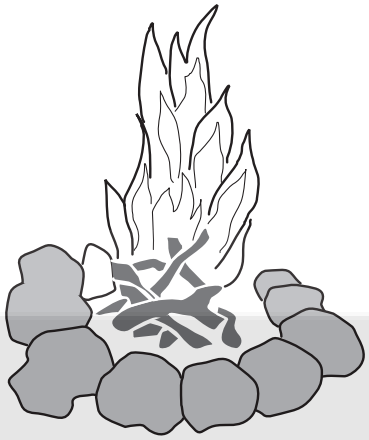
During mammalian cloning, some ..... are reactivated.

[2]

[Total: 4]

7 Tom is enjoying his camping holiday.

He sits by a camp fire.



(a) Complete the sentences.

Choose words from this list.

effectors

heat

light

motor

receptors

sensory

sound

Tom can see the flames of the fire.

The receptor cells in the retina of the eye are stimulated by ..... .

Impulses are carried from the eye to the brain by ..... neurons. **[1]**

(b) Some neurons have long fibres called axons.

(i) What surrounds the axon?

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

chloroplast	☐
membrane	☐
vacuole	☐
cell wall	☐

[1]

(ii) The axon of some neurons is also surrounded by a fatty sheath.

Describe **two** functions of the fatty sheath.

.....

.....

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

[Total: 4]

8 The gaps between sensory and motor neurons are called **synapses**.

(a) When an impulse is transmitted, a series of events take place at the synapse.

These statements are in the wrong order.

One statement is incorrect.

A Chemicals are released into the synapse.

B The receptor molecules produce chemicals.

C Chemicals bind with receptor molecules on the motor neuron membrane.

D Chemicals diffuse across the synapse.

E The impulse travels along the motor neuron.

F An impulse reaches the end of a sensory neuron.

Select the five correct statements and put them into the correct order.

Write the letters **A**, **B**, **C**, **D**, **E** or **F** in the boxes.

The last one has been done for you.

				E

[2]

(b) The synapse chemicals are **not** able to stimulate the sensory neuron.

Suggest why.

.....

.....

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

(c) A chemical found in many brain synapses is **serotonin**.

The drug Ecstasy causes an increase in serotonin concentration.

How does this happen?

.....

.....

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

[Total: 4]

9 Pavlov used salivation in dogs to study conditioned reflexes.

Pavlov's investigation consisted of a series of steps over a period of time to produce a **conditioned reflex**.

(a) At each step a different stimulus was provided.

A dog hears bell ringing

B dog shown food

C dog shown food and hears bell ringing

Write the letters **A**, **B** or **C** in the unshaded boxes to show the correct stimulus provided at each step.

step 1: initial reflex

	dog salivates	dog given food

step 2: repeated many times

	dog salivates	dog given food

step 3: conditioned reflex

	dog salivates	dog given food

[2]

Turn over for the remainder of question 9

(b) A number of conclusions could be made following the completion of this investigation.

Some conclusions are **true** and some are **false**.

Put a tick (✓) in each row to show whether each conclusion is true or false.

	true	**false**
The bell was used as a primary stimulus.		
The conditioned reflex response had a direct connection to the primary stimulus.		
The dog learned to associate the secondary stimulus with the primary stimulus.		

[2]

[Total: 4]

END OF QUESTION PAPER

OCR
RECOGNISING ACHIEVEMENT

F

GENERAL CERTIFICATE OF SECONDARY EDUCATION

TWENTY FIRST CENTURY SCIENCE BIOLOGY A

A223/01

Unit 3: Ideas in Context plus B7 (Foundation Tier)

OCE/13459

Candidates answer on the Question Paper
A calculator may be used for this paper

OCR Supplied Materials:
- Insert (inserted)

Other Materials Required:
- Pencil
- Ruler (cm/mm)

Wednesday 16 June 2010
Morning

Duration: 1 hour

A223010

Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use 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.
- 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).

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 **55**.
- Where you see this icon you will be awarded a mark for the quality of written communication in your answer.
- This document consists of **12** pages. Any blank pages are indicated.

Answer **all** the questions.

1 This question is based on the article 'World's common birds are declining'.

(a) The loss or destruction of a bird's habitat could result in a lowering of numbers of birds.

Write down two reasons why.

1 .....

2 .....
[2]

(b) In Europe, how many common bird species declined in numbers during the 26-year period?

answer ..... **[1]**

(c) An organisation involved in the conservation of birds decided that 'action was needed sooner rather than later'.

Using the example of the albatross, suggest

- what action is needed
- why action is needed soon.

.....

.....

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

(d) The white-rumped vulture population has been reduced by 99.9%.

Suggest two reasons why this measurement may not be accurate.

1 .....

.....

2 .....

.....
[2]

(e) The white-rumped vulture is in danger of extinction.

Write down two things that could be done to ensure that the vulture is not poisoned.

1 .....

2 .....

[2]

(f) Red kites were once said to be extinct in England.

They have now been reintroduced and are thriving.

Explain why this use of the word 'extinct' was misleading.

.....

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

(g) The article is about reducing biodiversity.

(i) Explain what is meant by **reducing biodiversity**.

One mark is for a clear, ordered answer.

.....

.....

..... **[2+1]**

(ii) Explain the importance of maintaining biodiversity.

.....

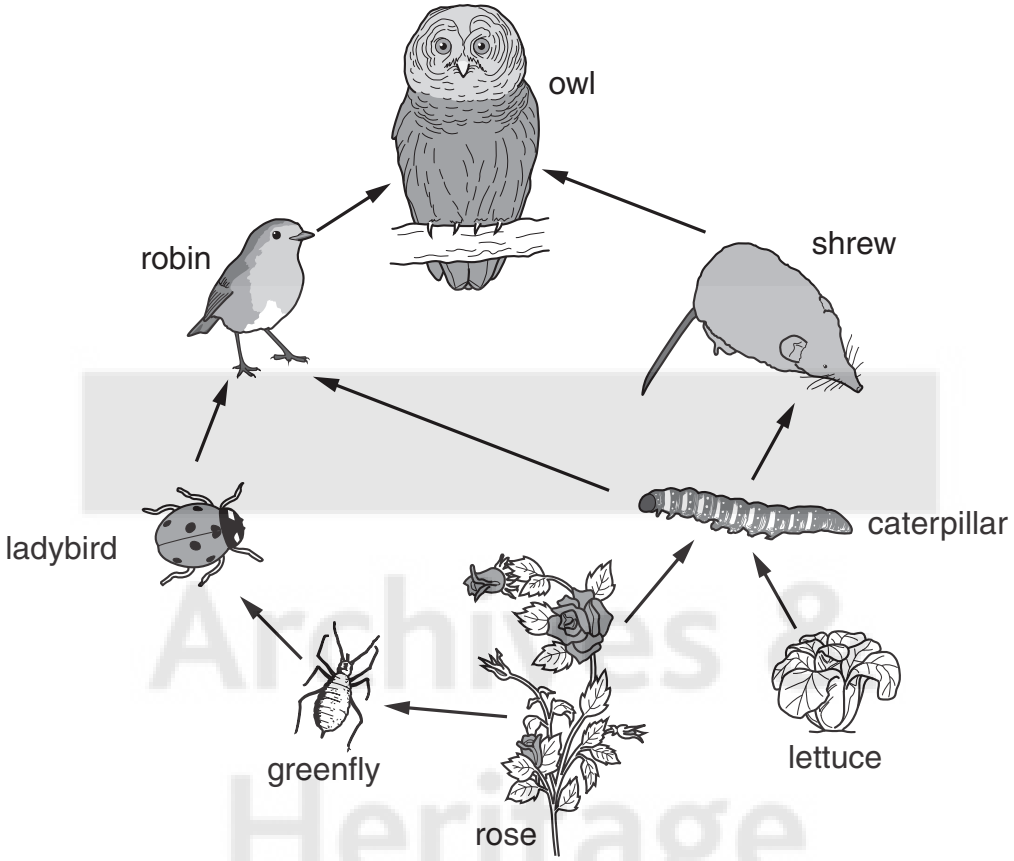
..... **[1]**

(h) How much would it cost to save 90 % of Africa's biodiversity for ten years?

£ ..... million **[1]**

[Total: 15]

2 Look at the food web.



(a) Write down the name of **one** autotroph and **one** heterotroph from the food web.

autotroph .....

heterotroph .....

[1]

(b) Autotrophs are different from heterotrophs.

Explain how.

.....

.....

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

(c) Energy passes through the food web.

(i) What is the source of this energy?

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

(ii) How is energy transferred **between** the organisms in the food web?

.....

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

(iii) Write down two ways in which energy is lost from this food web.

1 .....

2 .....

[2]

[Total: 7]

3 **(a)** These statements are stages in the process of photosynthesis.

A oxygen produced as a waste product

B light energy absorbed by chlorophyll

C energy used to rearrange atoms of carbon dioxide and water

They are in the wrong order.

Fill in the boxes with the letters **A**, **B** and **C** to put the stages in the correct order.

☐ ☐ ☐

[2]

(b) Describe three ways in which plants may use glucose produced by photosynthesis.

1 .....

2 .....

3 .....

[3]

(c) Plants grow in soil.

Write down three different components of soil.

1 .....

2 .....

3 .....

[2]

[Total: 7]

4 Photosynthesis takes place in green plants.

(a) Write down three factors that can limit the rate of photosynthesis.

1 .....

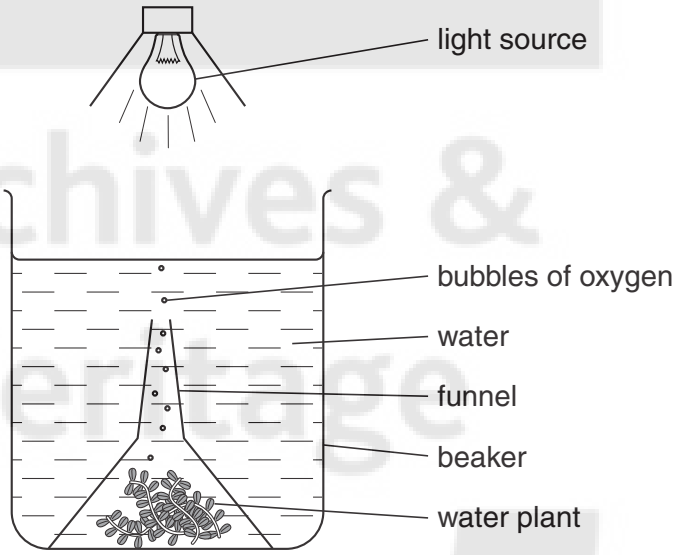
2 .....

3 .....

[2]

(b) The rate at which photosynthesis takes place can be measured.

One way to do this is to count the bubbles of oxygen given off by a water plant in one minute.



We can never be sure that a measurement tells us the true value of a quantity being measured.

Explain why trying to count the number of bubbles in one minute in this experiment may not give a **true value** for the rate of photosynthesis.

.....

.....

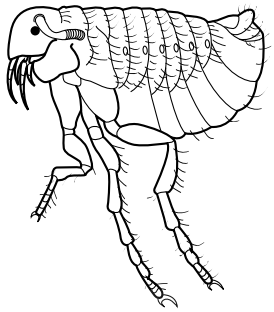
.....

.....

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

[Total: 5]

5 A flea is an example of a parasite.



(a) Explain what is meant by a **parasite**.

.....

.....

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

(b) Name **one** example of a parasite other than a flea.

Describe two features of this parasite that help it to be successful.

parasite ..... **[1]**

feature 1 .....

.....

feature 2 .....

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

(c) State **one** important effect of parasites on humans.

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

[Total: 6]

6 Neil and Anita want to have a baby.

They are worried that they might be carriers for cystic fibrosis, a genetic disorder.

They have a genetic test using DNA technology.

Explain how the test is carried out.

You **must** include these words in your answer.

autoradiography **DNA** **gene probe** **white blood cells**

.....

.....

.....

.....

.....

..... **[4]**

[Total: 4]

7 Steve is an athlete.

(a) He releases energy from glucose by respiration.

Complete the word equation for **aerobic** respiration in muscle cells.

Choose substances from this list.

alcohol **carbon dioxide** **lactic acid** **oxygen** **starch** **water**

glucose + oxygen → ……..... + ……..... + energy **[2]**

(b) When Steve is running, his muscle cells require a **faster** supply of oxygen and glucose.

(i) Explain why.

.....

.....

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

(ii) Explain how this faster supply is brought about.

.....

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

[Total: 6]

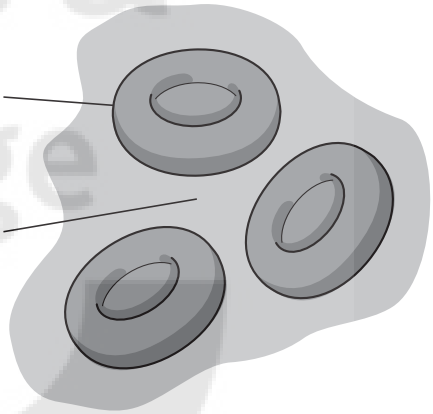
8 Human blood can be group **A**, **B**, **AB** or **O**.

(a) Look at the diagram of blood from a person who is **blood group B**.

Complete the labels using letters and words from the tables.

Each label needs a letter **and** a word.

letter	word
A	**antibodies**
	antigens
B	**dominant**
	haemoglobin
O	**recessive**



.... on the surface of a red blood cell

plasma containing ....

[2]

(b) During blood transfusions it is important to make sure that the donor and recipient are compatible.

For this to happen, the antigens in the donor's blood must not match the antibodies in the recipient's blood.

The table shows blood groups for both donors and recipients.

		donor			
		A	**B**	**AB**	**O**
recipient	**A**		✗		✓
	B	✗	✓	✗	✓
	AB	✓		✓	✓
	O	✗	✗		✓

(i) Complete the table with ticks (✓) or crosses (✗) to show the compatibility for each of the blood groups.

There are four spaces to complete. **[2]**

(ii) Which blood group, **A**, **B**, **AB** or **O**, can be donated to all other blood groups?

answer ..... **[1]**

[Total: 5]

END OF QUESTION PAPER

PLEASE DO NOT WRITE ON THIS PAGE

OCR
RECOGNISING ACHIEVEMENT

F

GENERAL CERTIFICATE OF SECONDARY EDUCATION

TWENTY FIRST CENTURY SCIENCE
BIOLOGY A

A223/01/INS

Unit 3: Ideas in Context plus B7 (Foundation Tier)

INSERT

Wednesday 16 June 2010
Morning

Duration: 1 hour

OCE/15701

INSTRUCTIONS TO EXAMS OFFICER/INVIGILATOR

- Do not send this insert for marking; it should be retained in the centre or destroyed.

INSTRUCTIONS TO CANDIDATES

- This insert contains the article required to answer question 1.

INFORMATION FOR CANDIDATES

- This document consists of **4** pages. Any blank pages are indicated.

BLANK PAGE

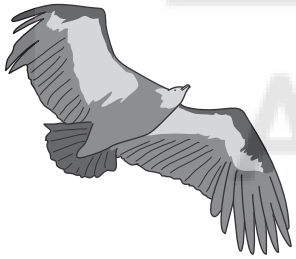
World's common birds are declining

Scientists are concerned that the world's common birds are declining in numbers. They believe this is caused by destruction of their habitats.

In Europe, a survey carried out by BirdLife International discovered that 45% of common bird species had shown a drop in numbers. In a 26-year period, 56 out of 124 species had declined. Birds such as the turtle dove had seen numbers drop by as much as 79%.

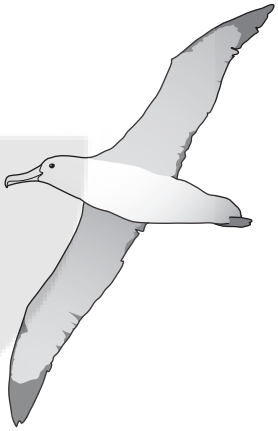
Another report published in 2008 stated that common bird species were declining all over the world.

A spokesperson from BirdLife International said that data from various surveys on bird species had been used. The surveys from around the world had shown a trend of a reduction in biodiversity. There was also a reduction in the numbers of birds migrating between Europe and Africa. More information was therefore needed about migratory birds as they moved between their winter feeding grounds and their summer nesting sites.



190 species of birds are now at high risk of extinction. In India, the number of white-rumped vultures has been reduced by 99.9%. It is thought that this has been caused by the vultures feeding on the bodies of dead cattle that had been treated with a drug called diclofenac. The concentration of diclofenac built up in the vultures' bodies and poisoned them. Diclofenac is still being used by some farmers in India.

Albatrosses are also at risk. Their population is being reduced by 100 000 a year. The birds drown when they get hooked and tangled up in very long fishing lines. Albatrosses are slow to mature and lay only a small number of eggs.



BirdLife International decided that a coordinated effort by many organisations was required and that action was needed sooner rather than later. BirdLife's Chief Executive said that biodiversity was easily affordable. He estimated that 90% of Africa's biodiversity could be saved for £500 million per year. He said, "The world is failing in its 2010 pledge to achieve a significant reduction in the current rate of loss of biodiversity".

OCR
RECOGNISING ACHIEVEMENT

H

GENERAL CERTIFICATE OF SECONDARY EDUCATION

TWENTY FIRST CENTURY SCIENCE A223/02

BIOLOGY A

Unit 3: Ideas in Context plus B7 (Higher Tier)

OCE/13465

Candidates answer on the Question Paper
A calculator may be used for this paper

OCR Supplied Materials:
- Insert (inserted)

Other Materials Required:
- Pencil
- Ruler (cm/mm)

Wednesday 16 June 2010
Morning

Duration: 1 hour

A223020

Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use 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.
- 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).

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 **55**.
- Where you see this icon you will be awarded a mark for the quality of written communication in your answer.
- This document consists of **12** pages. Any blank pages are indicated.

Answer **all** the questions.

1 This question is based on the article 'World's common birds are declining'.

(a) The article is about reducing biodiversity.

(i) Explain what is meant by **reducing biodiversity**.

One mark is for a clear, ordered answer.

.....

.....

..... **[2+1]**

(ii) Explain the importance of maintaining biodiversity.

.....

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

(b) Red kites were once said to be extinct in England.

They have now been reintroduced and are thriving.

Explain why this use of the word 'extinct' was misleading.

.....

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

(c) The white-rumped vulture is in danger of extinction.

Explain how scientists could find out if diclofenac was killing the vultures.

.....

.....

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

(d) The populations of common birds in Europe are falling.

Explain why it is not possible to tell from the article whether the fall in numbers has been happening over the full 26 years of the study or is more recent.

.....

.....

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

(e) A spokesperson said that data from various surveys showed a **trend** of a reduction in biodiversity.

Explain why it is necessary to use data from various surveys to show a trend.

.....

.....

.....

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

(f) Studying migratory birds in their summer nesting sites may not provide enough data to explain why their numbers are falling.

Suggest two reasons why.

.....

.....

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

(g) Diclofenac does not kill cattle.

Use your knowledge of pyramids of biomass to suggest why diclofenac may kill vultures.

.....

.....

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

[Total: 13]

2 Plants use energy from the Sun for growth.

Explain how energy from the Sun becomes available for plant growth.

.....

.....

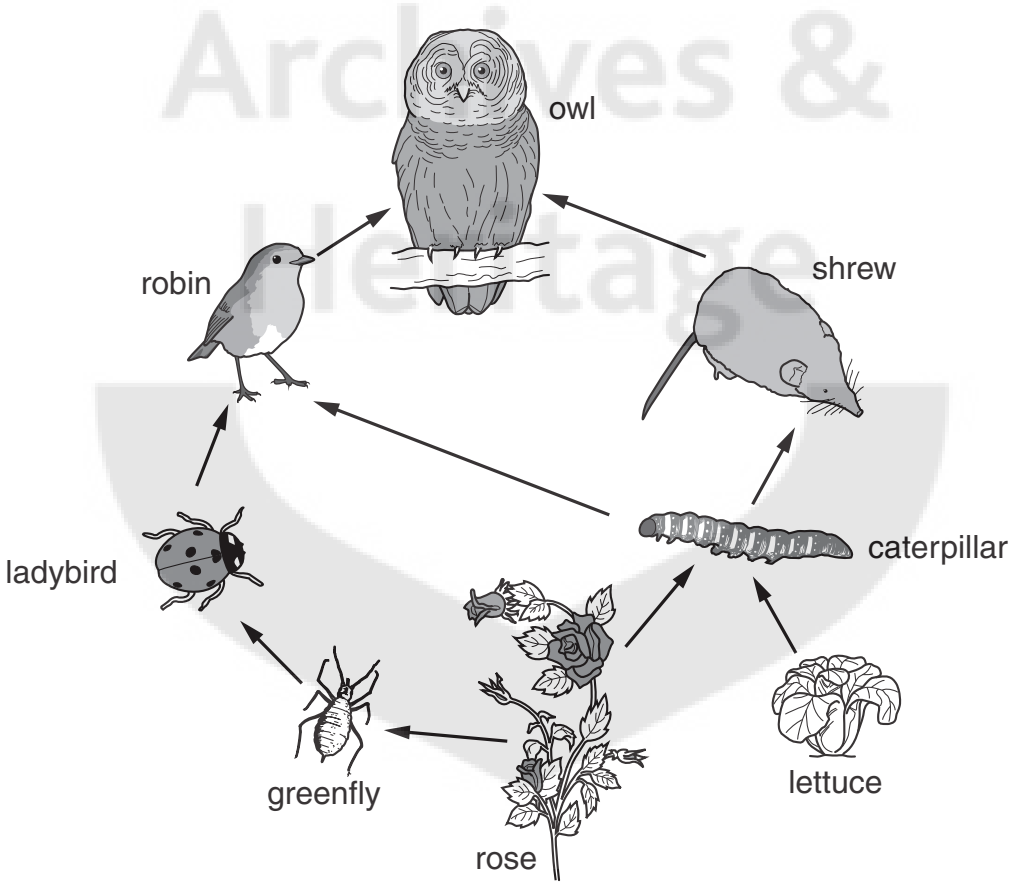
.....

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

[Total: 2]

3 Look at the food web.

The food web shows a number of food chains.



(a) Write down one food chain shown in the food web.

.....

Sketch a pyramid of biomass of **this food chain**.

Label each part of your pyramid.

Use the pre-drawn lines to help you draw the pyramid.

[4]

(b) Explain the advantages of using a pyramid of biomass compared to a pyramid of numbers.

.....

.....

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

[Total: 6]

4 Plants store food as starch.

(a) Explain why plants store food as starch rather than glucose.

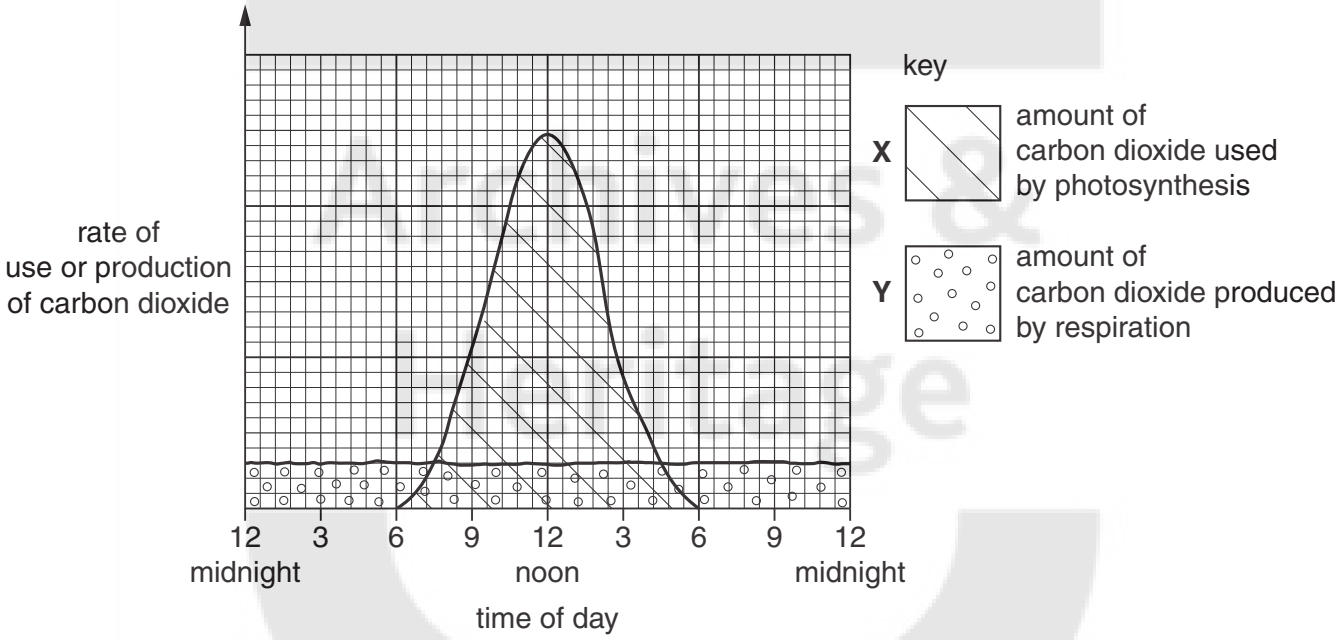
.....

.....

.....

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

(b) Look at the graph. It shows the amount of carbon dioxide used by photosynthesis and the amount of carbon dioxide produced by respiration in a plant over a 24-hour period.



(i) At what time of day is most carbon dioxide used by photosynthesis?

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

(ii) Write down the time of both compensation points.

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

(iii) The shaded area **X** is greater than the shaded area **Y**.

Explain why this is important for a plant.

.....

.....

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

[Total: 7]

5 Photosynthesis takes place in green plants.

(a) Write down three factors that can limit the rate of photosynthesis.

1 .....

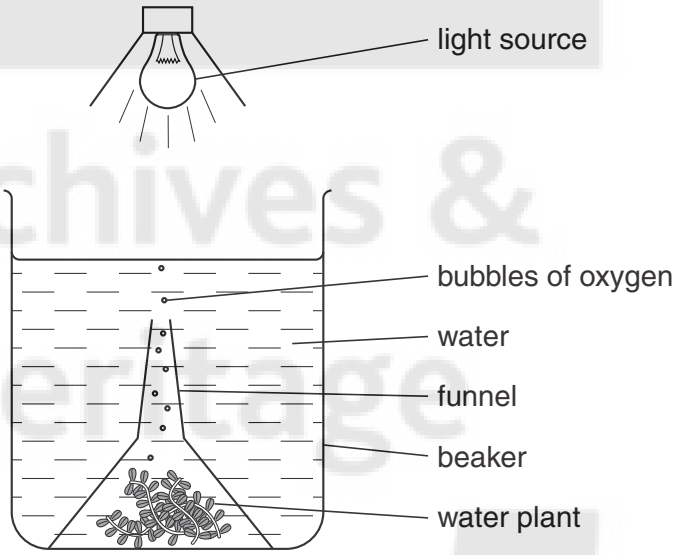
2 .....

3 .....

[2]

(b) The rate at which photosynthesis takes place can be measured.

One way to do this is to count the bubbles of oxygen given off by a water plant in one minute.



We can never be sure that a measurement tells us the true value of a quantity being measured.

Explain why trying to count the number of bubbles in one minute in this experiment may not give a **true value** for the rate of photosynthesis.

.....

.....

.....

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

[Total: 5]

6 There is a link between sickle-cell anaemia and malaria.

(a) Explain how sickle-cell anaemia is caused.

.....

.....

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

(b) In parts of the world where malaria is common there are more people that have sickle-cell anaemia.

Explain why.

.....

.....

.....

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

[Total: 5]

7 Neil and Anita want to have a baby.

They are worried that they might be carriers for cystic fibrosis, a genetic disorder.

They have a genetic test using DNA technology.

Explain how the test is carried out.

You **must** include these words in your answer.

autoradiography **DNA** **gene probe** **white blood cells**

.....

.....

.....

.....

.....

..... **[4]**

[Total: 4]

8 Steve is an athlete.

(a) He releases energy from food chemicals by the process of respiration.

Explain what happens to this energy **as** it is released by respiration.

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

(b) Describe what happens to muscle tissue when provided with this energy.

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

(c) Steve has his heart rate and blood pressure monitored at rest by his trainer.

Suggest why different athletes have different ranges of resting heart rate and blood pressure.

.....

.....

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

(d) When athletes exercise hard, they respire anaerobically.

Write down the word equation for anaerobic respiration.

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

[Total: 6]

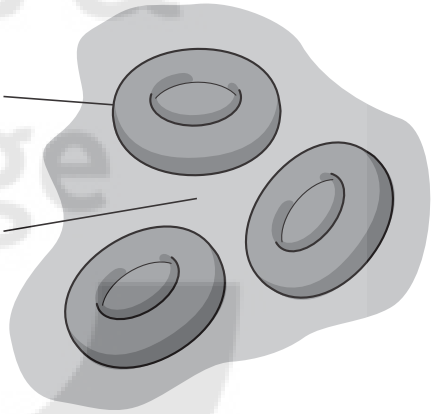
9 Human blood can be group **A**, **B**, **AB** or **O**.

(a) Look at the diagram of blood from a person who is **blood group B**.

Complete the labels using letters and words from the tables.

Each label needs a letter **and** a word.

letter	word
A	**antibodies**
	antigens
B	**dominant**
	haemoglobin
O	**recessive**



.... on the surface of red blood cell

plasma containing ....

[2]

(b) During blood transfusions it is important to make sure that the donor and recipient are compatible.

For this to happen, the antigens in the donor's blood must not match the antibodies in the recipient's blood.

The table shows blood groups for both donors and recipients.

recipient \ donor	A	B	AB	O
A	✓		✗	
B		✓		
AB			✓	
O	✗			✓

Complete the table with ticks (✓) or crosses (✗) to show the compatibility for each of the blood groups.

Some have been done for you. **[3]**

(c) Transfusing even a small amount of blood that does not match may lead to the death of the recipient.

Explain why.

.....

.....

.....

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

[Total: 7]

END OF QUESTION PAPER

PLEASE DO NOT WRITE ON THIS PAGE

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RECOGNISING ACHIEVEMENT

H

GENERAL CERTIFICATE OF SECONDARY EDUCATION

TWENTY FIRST CENTURY SCIENCE
BIOLOGY A

A223/02/INS

Unit 3: Ideas in Context plus B7 (Higher Tier)

INSERT

Wednesday 16 June 2010
Morning

Duration: 1 hour

OCE/15702

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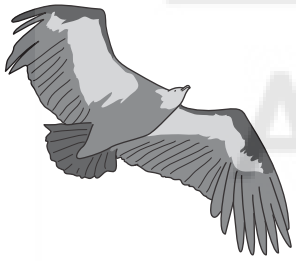

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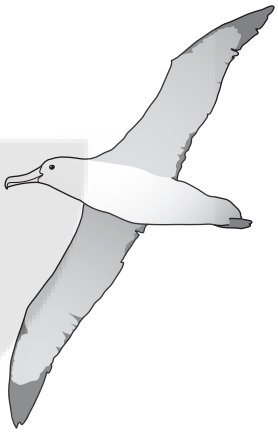

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