



GENERAL CERTIFICATE OF SECONDARY EDUCATION
GATEWAY SCIENCE
BIOLOGY B

Unit 1 Modules B1 B2 B3 (Foundation Tier)

WEDNESDAY 21 MAY 2008

F
B631/01

Afternoon
 Time: 1 hour

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

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Candidate
Number

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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.
- 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	

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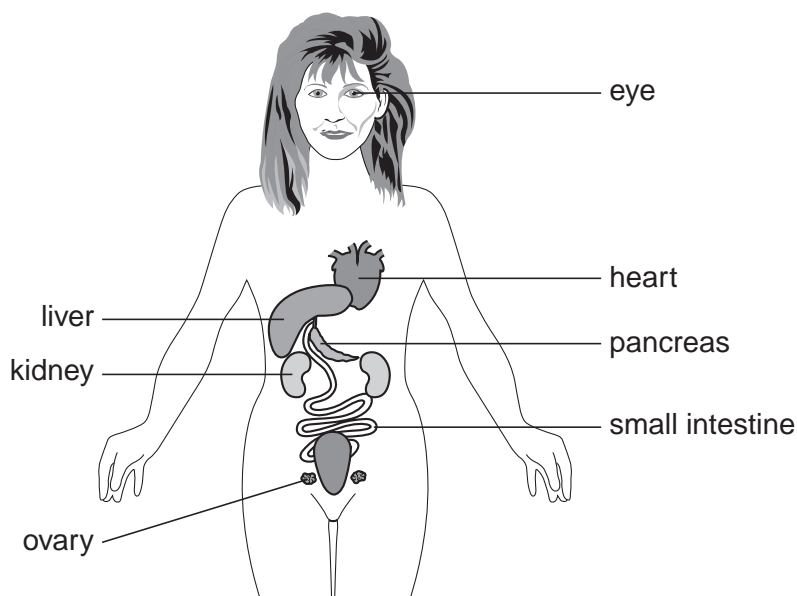
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3

Answer **all** the questions.**Section A – Module B1**

- 1 The diagram shows some of the organs in the body.



Write down the name of the organ that fits each description.

Choose the organ from the diagram.

Each organ may be used **once, more than once or not at all**.

- (a) An organ that contains light receptors [1]
- (b) An organ that makes insulin [1]
- (c) An organ which may develop cirrhosis if too much alcohol is consumed
..... [1]
- (d) An organ that makes oestrogen [1]

[Total: 4]

2 Ravi is not feeling very well.

He thinks that he might have the flu.



(a) Put a ring around the type of microorganism that causes flu.

bacteria

fungus

protozoa

virus

[1]

(b) The microorganism that causes flu was breathed in by Ravi.

How does the body try and stop microorganisms getting into the lungs?

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

hydrochloric acid is made

☐

blood clots

☐

mucus is made

☐

[1]

(c) Ravi thinks that the microorganism is increasing his body temperature above normal.

He measures his temperature.

Suggest how he does this.

..... [1]

(d) After a few days, Ravi starts to feel better.

His body has started to destroy the microorganisms that are causing his flu.

Write down which cells in his body are destroying the microorganisms.

..... [1]

5

(e) Not all disorders are caused by microorganisms.

Some are inherited.

Complete the table by writing an **I** next to the disorders that are inherited and an **M** next to those that are caused by microorganisms.

The first two have been done for you.

flu	M
red-green colour blindness	I
athlete's foot	
cholera	
cystic fibrosis	
sickle-cell anaemia	

[2]

[Total: 6]

- 3 Nick is keen on exercising.
He is using an exercise cycle.



- (a) When he starts to cycle, changes occur in his body.

Draw straight lines to join each **change** with the **reason** that it occurs.

change

Nick's heart beats faster.

Nick breathes faster.

Nick's muscles respire faster.

reason

This removes more carbon dioxide from his lungs.

This supplies his muscles with more glucose.

This releases more energy from his food.

[2]

7

(b) Nick wants to work out how fit he is.

He measures how long it takes his heart rate to go back to normal after cycling.

Put a tick (✓) in the box next to the name of this type of measurement.

highest respiration rate

☐

pulse rate recovery time

☐

maximum breathing rate

☐

fastest cycling time

☐

[1]

(c) (i) When Nick cycles, his muscles use oxygen for respiration.

Finish the word equation for this type of respiration.

oxygen + → carbon dioxide + + energy

[2]

(ii) When Nick cycles faster, he finds that his muscles start to hurt.

Nick knows that the pain is caused by lactic acid.

Why is lactic acid produced in Nick's muscles when he cycles fast?

..... [1]

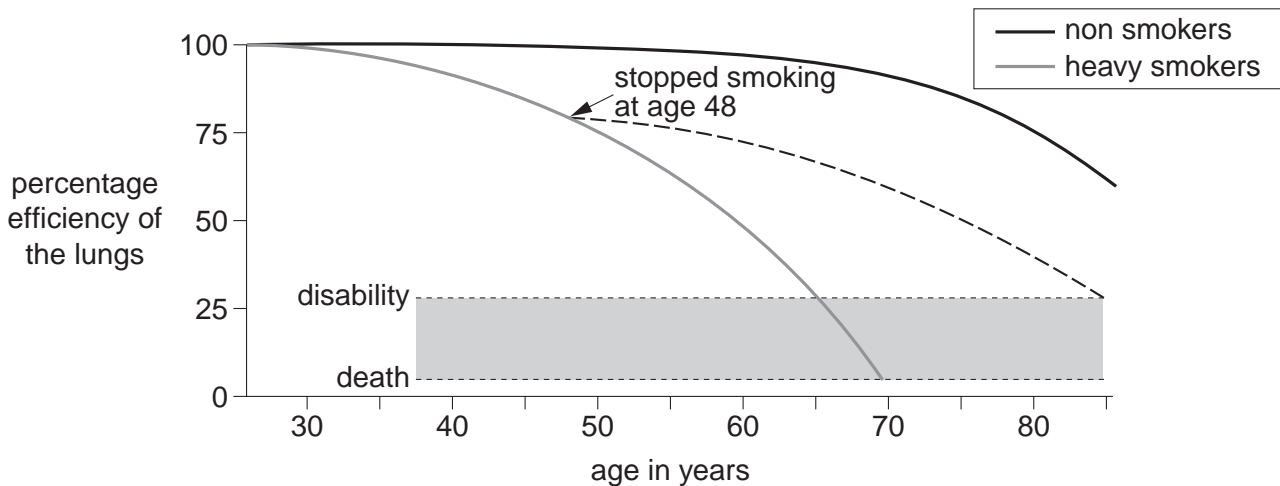
[Total: 6]

4 Tobacco smoke can affect the lungs.

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

..... [1]

(b) The graph shows how well the lungs work at different ages. This is shown for two groups of people. One group are heavy smokers, and the others do not smoke. It also shows the effect of stopping smoking at age 48.



Use the graph to help you answer the questions.

(i) Continuing to smoke heavily can damage the lungs and lead to disability. At what age does the graph show this disability occurring?

..... [1]

(ii) Doug is a 48 year-old heavy smoker.



What can Doug tell **from the graph** about what he might expect if he gives up smoking now?

.....

 [2]

[Total: 4]

Section B – Module B2

- 5 Look at the picture of a red squirrel.



© iStockphoto.com / photoGartner

- (a) In Britain, red squirrels are a protected species.

Look at the statements.

Which **one** is a true statement about red squirrels in Britain?

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

They are extinct.

☐

They are endangered.

☐

They are **not** endangered.

☐

They can be found all over Britain.

☐

[1]

- (b) Red squirrels compete with grey squirrels.

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

..... [1]

- (c) Red squirrels are prey to predators such as sparrow hawks.

- (i) Describe **one** way squirrels are adapted to avoid being caught by sparrow hawks.

.....
 [1]

- (ii) Suggest **one** way predators are adapted to help them catch squirrels.

.....
 [1]

[Total: 4]

6 Sally investigates two different pond habitats, pond **A** and pond **B**.

(a) What is meant by the term **habitat**?

..... [1]

(b) Sally collects some different animals from pond **A**.

Look at the pictures.

They show some of the animals she collects.



snail



fish



water boatman



frog

Write down the name of **one** amphibian Sally collects.

Choose your answer from the pictures.

..... [1]

(c) Look at the list.

It shows different apparatus Sally uses to investigate the habitat.

Put a **(ring)** around the apparatus Sally uses to collect the fish.

net

pooter

pit-fall trap

quadrat

[1]

(d) Sally records the numbers of the animals she finds.

The table shows her results.

animal	number caught	
	pond A	pond B
frog	2	1
fish	10	3
tadpole	15	2
water boatman	5	0
snail	8	2

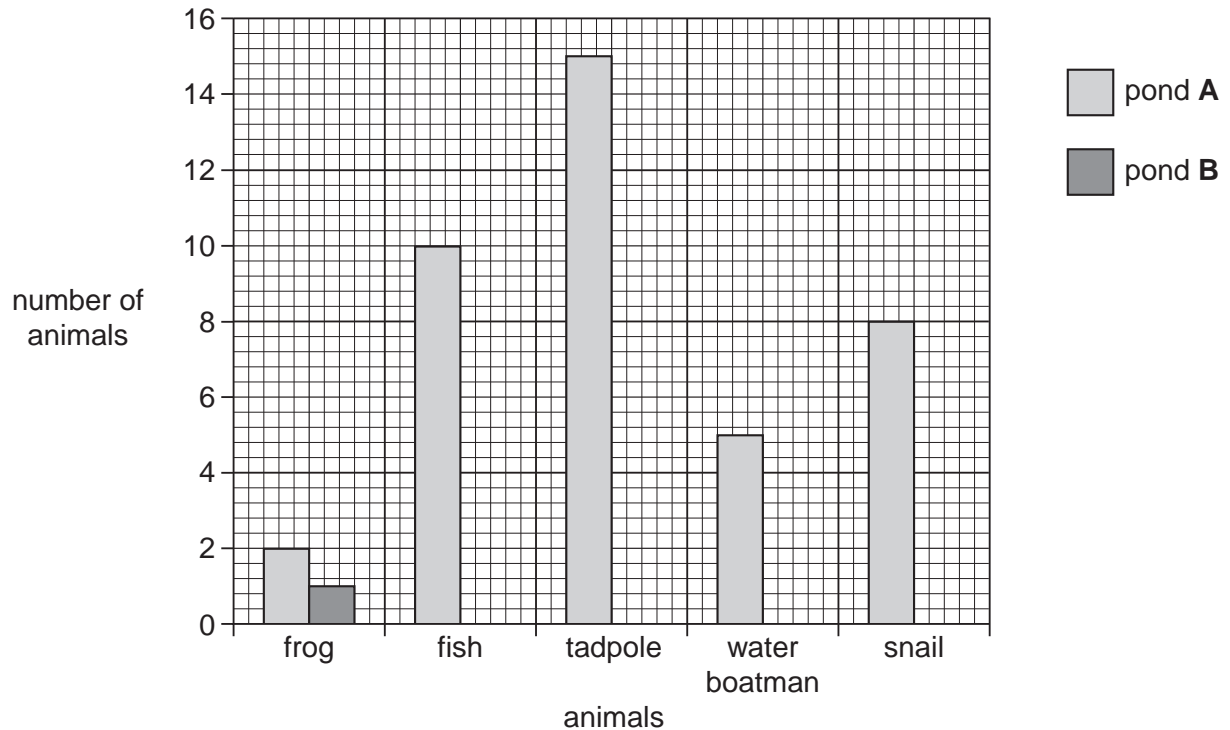
11

Sally puts her results for pond **A** onto a bar chart.

Finish the bar chart to show Sally's results for pond **B**.

The first one has been done for you.

[2]



(e) Sally thinks her results show that pond **B** is more polluted than pond **A**.

Suggest how her results show this.

.....
 [1]

[Total: 6]

7 Look at the photograph.

It shows two palm trees.



© iStockphoto.com / Ulrike Hammerich

(a) The trees make their own food through a process called photosynthesis.

Name the gas that trees **make** during photosynthesis.

Put a ring around the correct answer.

carbon dioxide

carbon monoxide

nitrogen

oxygen

[1]

(b) Look at the statements.

They are about photosynthesis.

Which one is **not** true?

Put a tick (✓) in the box next to the statement that is **not** true.

Photosynthesis is faster in the winter.

☐

Photosynthesis is faster in the summer.

☐

Photosynthesis stops in the dark.

☐

Photosynthesis is faster if there is more light.

☐

[1]

(c) During photosynthesis, the trees make glucose.

The trees change the glucose into other substances, such as starch for storage.

Explain **one other** way that the trees change the glucose and use the glucose.

what the glucose is changed into

what the glucose is used for [2]

(d) Trees also carry out respiration.

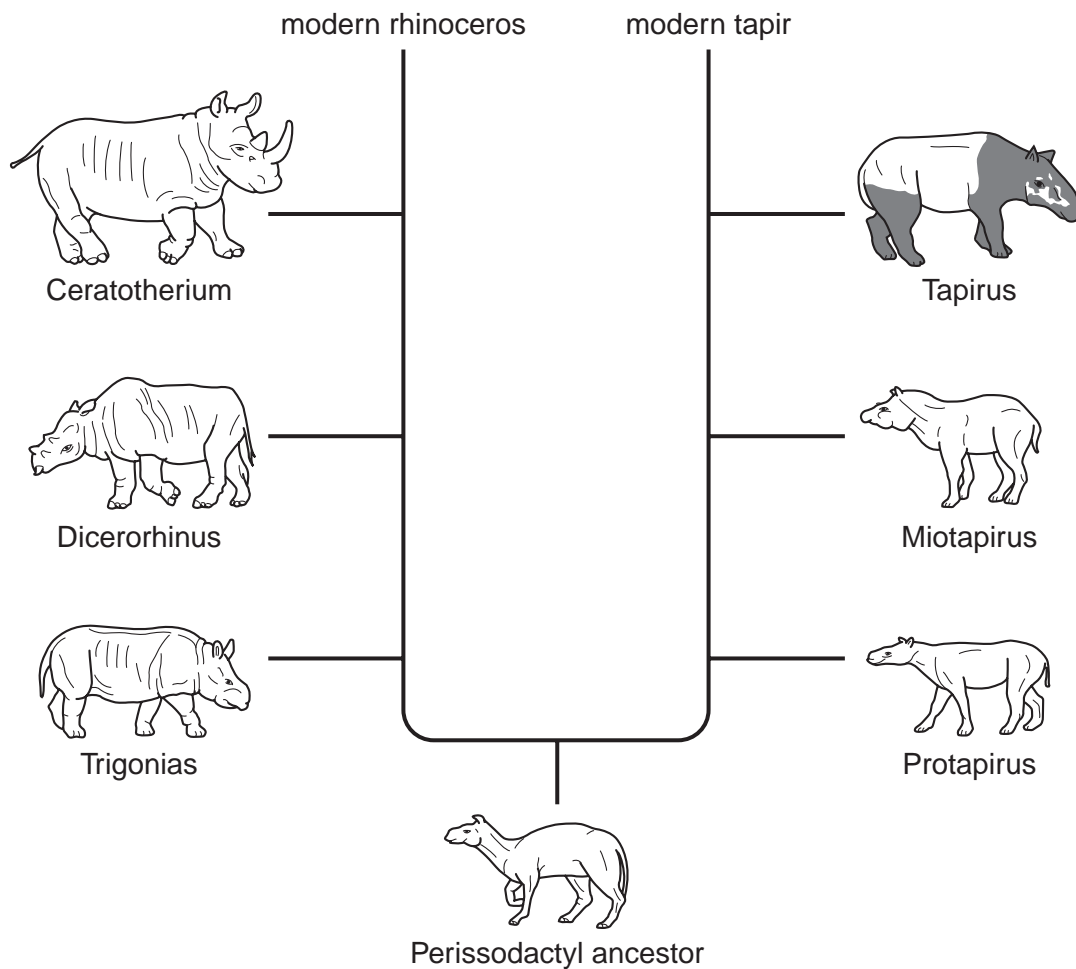
Explain why plants need to respire 24 hours a day.

..... [1]

[Total: 5]

8 Look at the picture.

It shows the fossil record of the rhinoceros and tapir.



(a) Explain how the diagram shows that the rhinoceros and the tapir are related species.

.....
 [1]

(b) The fossil record is based on fossils found in rocks.

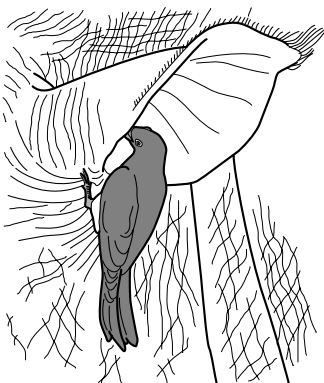
Describe how animals become fossilised.

.....

 [2]

(c) Look at the picture.

It shows a bird called an oxpecker in the ear of a rhinoceros.



The oxpecker eats insects.

(i) Explain how this helps the rhinoceros.

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

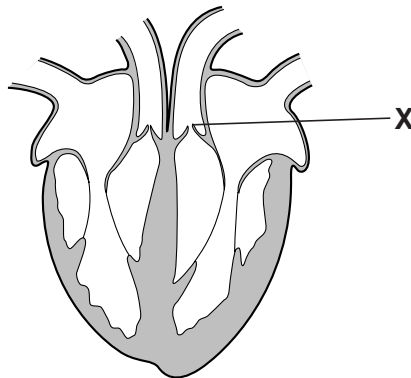
(ii) Write down the name given to animals that help another animal in this way.

..... [1]

[Total: 5]

Section C – Module B3

- 9 Look at the diagram of a heart.



- (a) Look at the statements.

Which **one** is a true statement about the heart?

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

It is the largest organ in the body.

☐

The right side pumps blood to the lungs.

☐

The left side pumps blood to the lungs.

☐

Arteries take blood back to the heart.

☐

[1]

- (b) (i) Write down the **name** of part X.

..... [1]

- (ii) Write down the **job** of part X.

.....
 [1]

17

- (c) Some people need to have a heart transplant.

Some scientists want to clone mammals to provide hearts for transplant.

- (i) Write down the name of the **first** mammal cloned from an adult cell.

..... [1]

- (ii) Some people object to the cloning of mammals.

Suggest why.

.....

..... [1]

[Total: 5]

18

- 10 (a) Stephen uses a microscope to look at leaf cells.

Look at the diagram.

It shows one of the leaf cells.



Label the diagram.

Choose from this list.

cell membrane

chloroplast

cytoplasm

nucleus

vacuole

[2]

19

(b) Stephen then makes a microscope slide to show stained onion cells.

Here is a list of **some** of the apparatus he uses:

- microscope slide
- cover slip
- knife

Describe how Stephen could use the apparatus to make a stained slide of onion cells.

You may use a **labelled** diagram to help you.

.....

.....

.....

..... [2]

[Total: 4]

11 This question is about DNA.

(a) Which part of the cell contains DNA?

Put a ring around the correct answer.

cell membrane

cell wall

nucleus

vacuole

[1]

(b) Sections of DNA called genes code for proteins.

Enzymes and some hormones are proteins.

(i) Describe the effect of **enzymes** on chemical reactions in the body.

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

(ii) Plant hormones control the growth of shoots and roots.

Write down **one other** thing that plant hormones control.

..... [1]

21

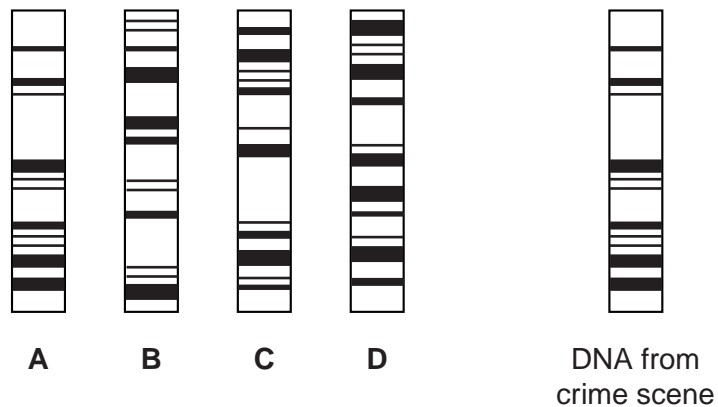
(c) Scientists can use DNA to identify people.

They use a process called DNA fingerprinting.

Look at the diagram.

It shows the DNA fingerprints of four people suspected of a crime.

It also shows the DNA from the crime scene.



Which suspect, **A**, **B**, **C** or **D**, was present at the crime scene?

Explain your answer.

.....
 [2]

[Total: 5]

12 This question is about selective breeding.

The table shows information about four varieties of blueberries.

variety	part of the season when fruit is ready	fruit	can be harvested by machine
Spartan	early	large with tangy flavour	yes
Toro	midseason	medium size and sweet	no
Bluecrop	midseason	large but bitter	yes
Northblue	midseason	small with wild blueberry taste	no

Sandra is a commercial grower.

She grows all four blueberry varieties to sell to supermarkets.

(a) Which variety of blueberry has been bred to be in the shops earliest in the year?

..... [1]

(b) Toro is a popular variety in the shop.

Suggest **one** disadvantage of growing Toro blueberries.

..... [1]

(c) Sandra wants to grow a new variety of blueberry.

She uses selective breeding to produce blueberries that are large and sweet.

Write down **two** varieties she could use in her breeding program.

..... [1]

(d) New blueberry varieties could also be produced by genetic engineering.

(i) Explain what is meant by the term **genetic engineering**.

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

(ii) Describe **one** disadvantage of genetic engineering.

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

[Total: 6]

END OF QUESTION PAPER

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