THIS IS A LEGACY SPECIFICATION

OCR
RECOGNISING ACHIEVEMENT

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Tuesday 31 January 2012 – Morning

GCSE GATEWAY SCIENCE
BIOLOGY B

B632/01 Unit 2 Modules B4 B5 B6 (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)

Duration: 1 hour

Candidate forename		Candidate surname	

Centre number						Candidate number				

MODIFIED LANGUAGE

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. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- 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).
- 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 **16** pages. Any blank pages are indicated.

Answer **all** the questions.

Section A – Module B4

1 Bill has a compost heap in his garden.

He uses it to recycle some of his kitchen and garden waste.

(a) Look at the following types of waste.

Put (rings) around the **two** answers that are most suitable for making compost.

aluminium cans **damaged fruit** **plastic bags** **potato peelings** **tree branches** **[2]**

(b) Microorganisms called decomposers live in the compost heap. They decay the waste.

Write down **one type** of microorganism that is a decomposer.

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

(c) Bill often digs over his compost heap, turning it with a garden fork.

This speeds up the decay process.

Suggest **one** reason why it speeds up the decay process.

.....

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

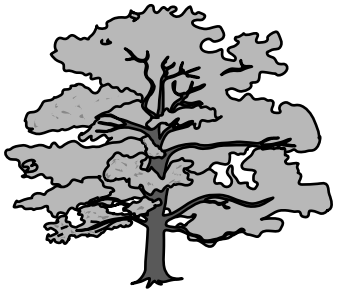
(d) Tree branches are an example of biomass.

What process produces biomass?

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

[Total: 5]

2 Look at the picture of an oak tree.



(a) How does water move through a tree?

In your answer include

- where water enters a tree
- where water leaves a tree
- the processes involved.

.....

.....

.....

.....

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

(b) As well as water, other substances enter a tree.

Complete the table to show where each substance enters a tree.

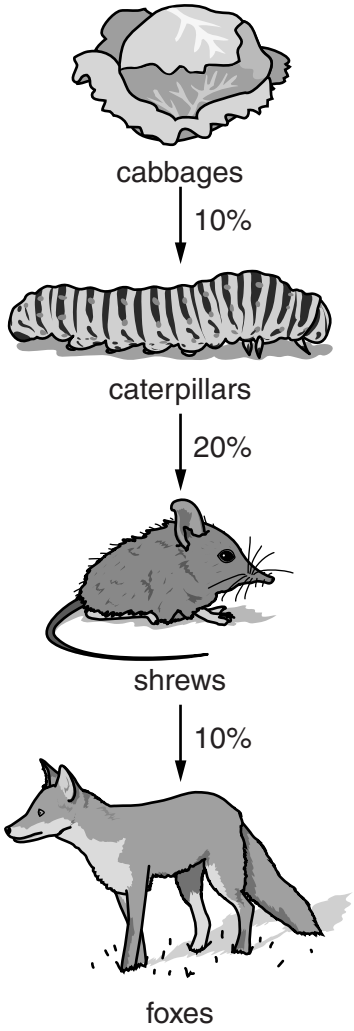
substance	where it enters
carbon dioxide	
nitrate	
potassium	

[3]

[Total: 7]

3 Look at the food chain.

The numbers show the percentage of energy at each stage that is transferred to the next stage.



(a) (i) For every 1000 J of energy stored in the cabbages, how many joules of energy are **not** transferred to the caterpillars?

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

(ii) For every 1000 J of energy stored in the cabbages, how many joules of energy are transferred to the foxes?

Show your working.

answer ..... J **[2]**

(iii) Write down **two** reasons why **not all** the energy in the cabbages is transferred to the foxes.

1 .....

.....

2 .....

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

(b) A farmer has three fields of cabbages.

She wants to kill the caterpillars on her cabbages.

(i) One way to do this is to use chemicals.

What is the name of the type of chemical she could use?

Put a (ring) around the correct answer.

fertiliser **fungicide** **herbicide** **insecticide** **[1]**

(ii) Describe **one other** way she could kill the caterpillars in her fields.

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

(c) Cabbages can also be grown using a hydroponics system.

What is a hydroponics system?

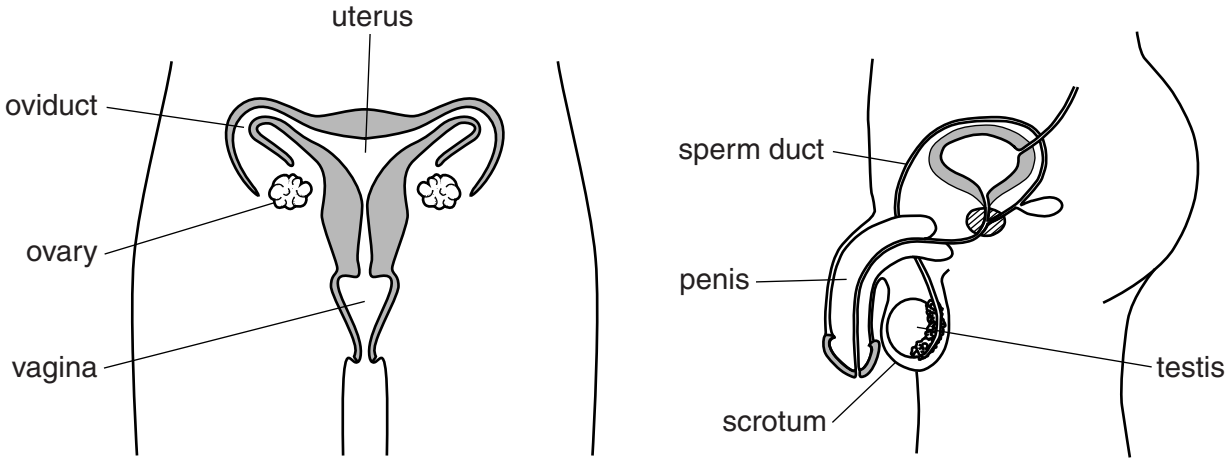
.....

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

[Total: 8]

Section B – Module B5

4 **(a)** The diagrams show the female and male reproductive systems.



female **male**

The female and male gametes are made in special organs.

What are the names of these two organs?

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

penis ☐

ovary ☐

oviduct ☐

sperm duct ☐

testis ☐

[2]

(b) (i) David and Sue want to have children.

What process must happen before Sue can become pregnant?

Put a (ring) around the correct answer.

amniocentesis **fertilisation** **immunisation** **infection**

[1]

(ii) Sue becomes pregnant.

The midwife puts her fingers on Sue's wrist to check her heart beat.

What is the midwife measuring to check Sue's heart beat?

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

(iii) The foetus gets the oxygen it needs from Sue's blood.

Which organ system in the foetus is **not** used until birth?

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

(iv) Sue and her foetus have different blood groups.

Sue is blood group **A** and the foetus is blood group **O**.

What else about their blood groups might be different?

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

[Total: 6]

5 Chronic obstructive pulmonary disease (COPD) is a general term which includes chronic bronchitis and emphysema.

COPD reduces the excretion of a waste gas.

(a) Write down the name of this waste gas.

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

(b) **(i)** COPD affects the **vital capacity**.

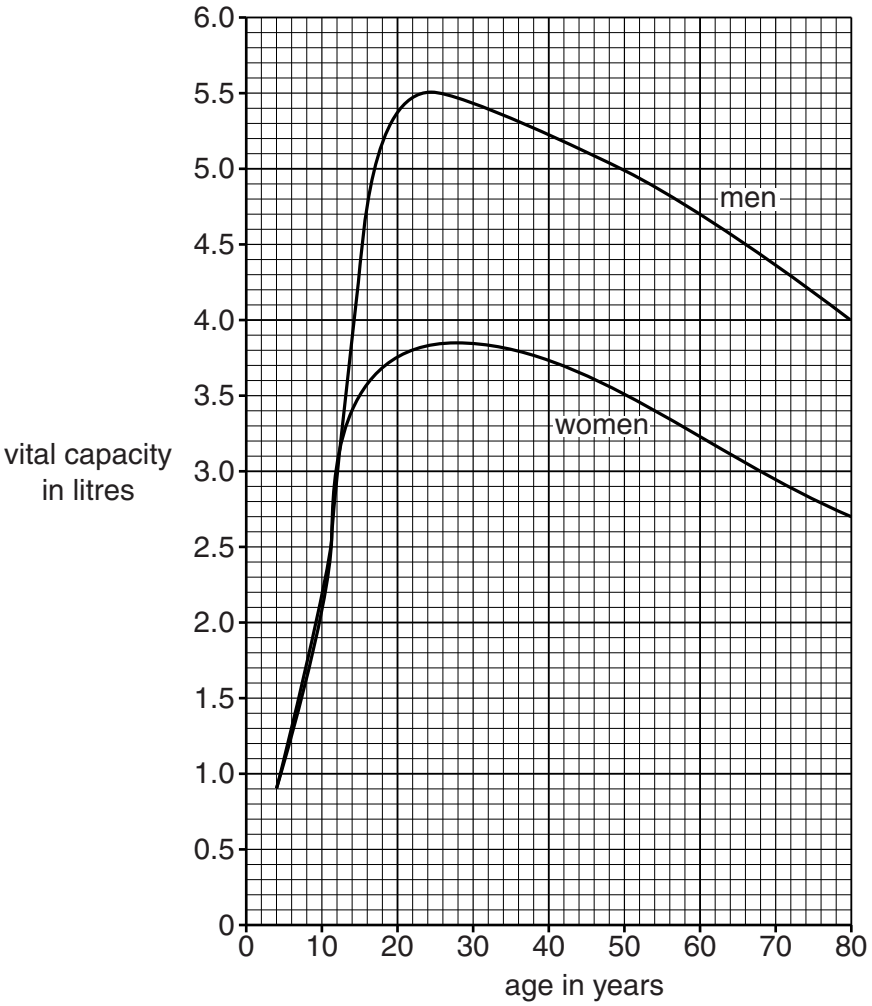
What is vital capacity?

.....

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

(ii) Look at the graph.

It shows the vital capacity for men and women at different ages.



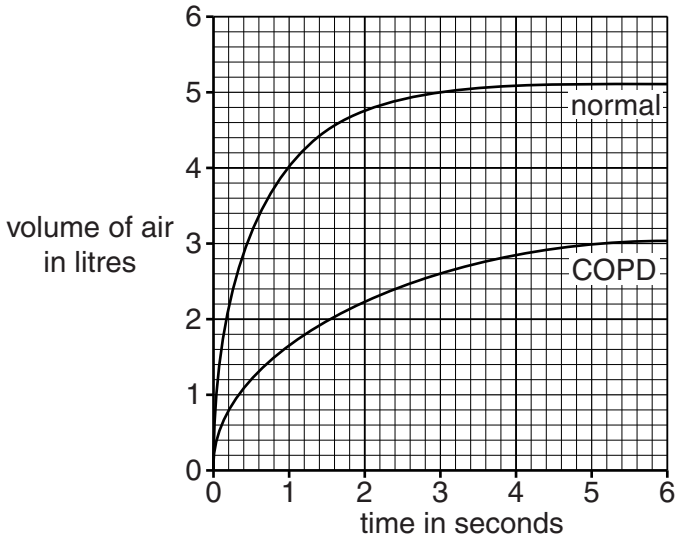
What is the difference in vital capacity between men and women at the age of thirty?

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

(iii) People who have COPD have difficulty breathing normally.

The graph shows the volume of air breathed out in six seconds by two forty-year-old men.

One has COPD.



Calculate the percentage **reduction** in air breathed out after three seconds for the man with COPD.

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

(c) Someone with a severe case of COPD may need a lung transplant.

Where would the transplanted lungs come from?

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

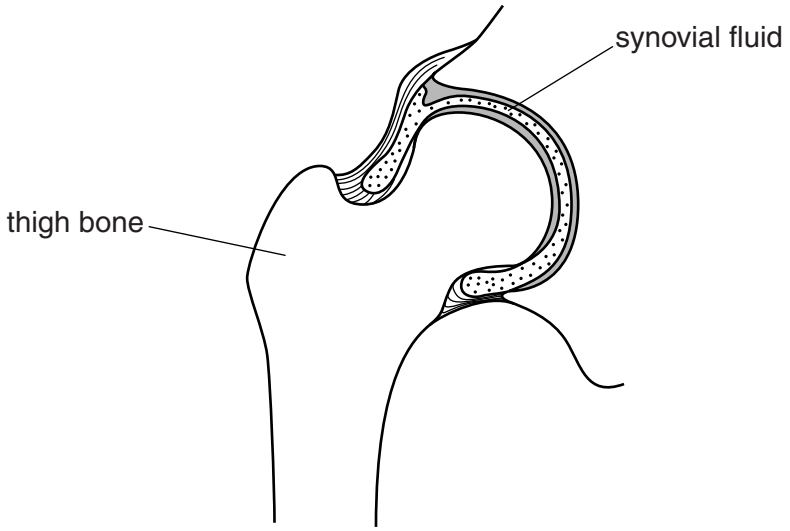
(d) New cells are produced for the transplant to work successfully.

What type of cell division produces these new cells?

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

[Total: 7]

6 Look at the diagram of a hip joint.



(a) The hip joint is a synovial joint.

Write down the name of this type of synovial joint and describe the range of movement it provides.

type of joint .....

range of movement.....

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

(b) Bones are strong but can be fractured.

Draw straight lines to connect each **type of fracture** to its correct **description**.

type of fracture	description
compound	break involves just bone
green stick	bone just bends or splinters
simple	other tissue involved and bone may come through skin

[2]

(c) Esther is 80 years old.

Esther is recovering from a fractured hip.

Bone came through her skin and damaged blood vessels causing bleeding.

The bleeding stopped before she got to hospital.

Her doctor is worried that blood flow in other blood vessels may be blocked and treats her with drugs.

Explain why.

In your answer write about

- what caused the bleeding to stop before Esther got to hospital
- what is blocking the blood flow
- the type of drugs the doctor uses to treat Esther's blood problem.

.....

.....

.....

.....

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

[Total: 7]

Section C – Module B6

7 Read the information about the Blue Mountain cider kit.

Blue Mountain cider kit

Blue Mountain cider kits contain fruit grown in the best British orchards. This kit also contains high quality yeast needed to make the alcohol. All you need to do is add sugar and water then leave in a warm place.

The kit should be stored in a dry place until needed.

(a) Which fruit is used to make cider?

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

(b) Yeast is a fungus.

Write down **one** disease caused by a fungus.

Choose from this list.

athlete's foot **chicken pox** **malaria** **tuberculosis**

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

(c) Yeast breaks down sugar to make alcohol.

Write down the name of this process.

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

(d) The kit needs to be stored in a dry place.

Explain why.

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

(e) Alcohol made by yeast can be mixed with petrol.

The mixture is used as a biofuel.

Write down the name of this biofuel.

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

[Total: 5]

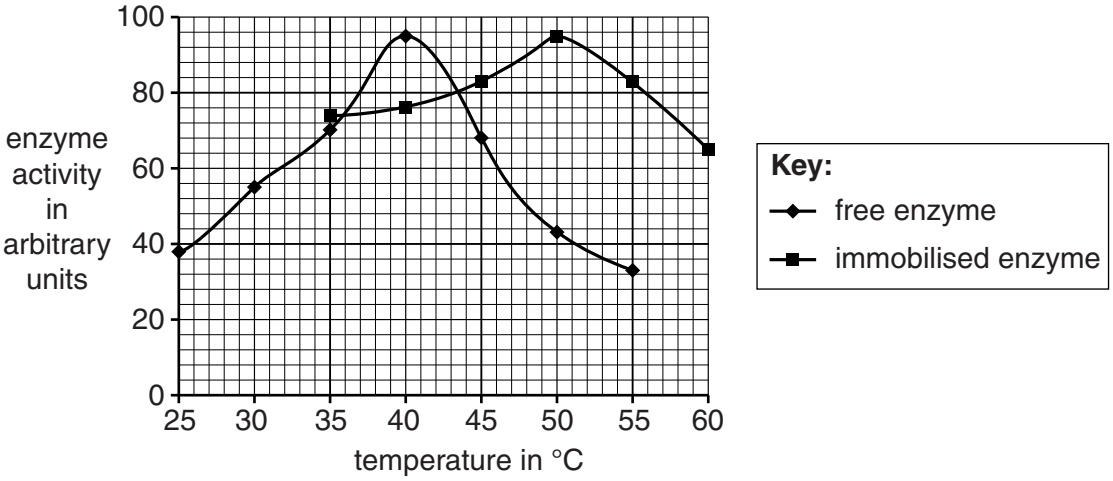
8 Lawrence and Waseem are investigating an enzyme.

They measure the activity of the enzyme over a range of temperatures.

First they use the enzyme immobilised inside beads.

Then they repeat the experiment with the enzyme free in solution.

The graph shows their results.



(a) What substance is used to make the beads which immobilise the enzyme?

Choose from this list.

alginate **copper sulfate** **lipase** **sodium hydroxide**

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

(b) Use data from the graph to answer these questions.

(i) Changing the temperature of the **free** enzyme from 25 °C to 40 °C increases its activity.

Calculate how much the activity increases between 25 °C and 40 °C.

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

(ii) Immobilising the enzyme affects its activity.

What difference does this make to its activity at the temperatures shown in the graph?

.....

.....

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

[Total: 5]

9 Look at the picture.

It shows banana plants.

(a) The banana plants have a disease caused by a fungus.

Scientists want to genetically engineer banana plants to protect them from the fungus.

They want to use onions that are resistant to the fungus.

Describe how banana plants could be genetically engineered to make them resistant to the fungus.

.....

.....

.....

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

(b) Banana plants grow in soil.

Write down **two** reasons why the banana plants need soil.

1 .....

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

(c) Soil contains detritivores, such as earthworms.

(i) Put a tick (✓) in the box next to **one other** type of detritivore found in soil.

humus	☐
centipede	☐
slug	☐
springtail	☐

[1]

(ii) Earthworms improve the structure and fertility of soil.

One way they do this is by burying organic matter.

Write down **two other** ways that earthworms improve the soil.

1 .....

.....

2 .....

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

(d) After the bananas have been harvested, the stalk of the banana plant is chopped down.

The stalks can then be put into a special container to make biogas.

(i) Write down the name of this container.

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

(ii) Biogas is a mixture of gases.

Write down the name of the **main** gas found in biogas.

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

(iii) Biogas can be used to make electricity.

This is important to people living in remote parts of the world.

Write down **one** reason why.

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

[Total: 10]

END OF QUESTION PAPER

PLEASE DO NOT WRITE ON THIS PAGE