

Tuesday 12 June 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					

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.

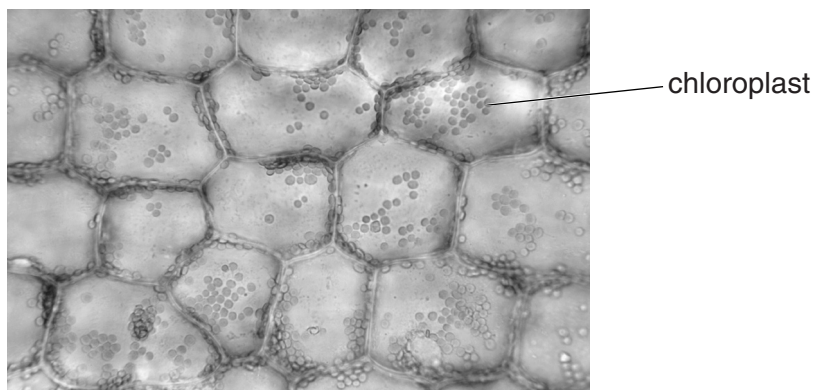
INFORMATION FOR CANDIDATES

- 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 **20** pages. Any blank pages are indicated.

2

Answer **all** the questions.**Section A – Module B4**

- 1 Look at the picture of chloroplasts in some plant cells.



- (a) (i) Write down the job of chloroplasts during photosynthesis.

..... [1]

- (ii) Root cells do **not** have chloroplasts.

Explain why.

.....
 [1]

- (b) Chloroplasts contain chlorophyll.

Plants need magnesium to make chlorophyll.

- (i) Plants deficient in magnesium do not grow as well as healthy plants.

Write down **one other** sign of magnesium deficiency in a plant.

..... [1]

- (ii) Gardeners can add a substance to the soil if it lacks magnesium.

Write down the name of a substance they can add.

..... [1]

- (c) Plants are found at the start of a food chain.

Explain why.

..... [1]

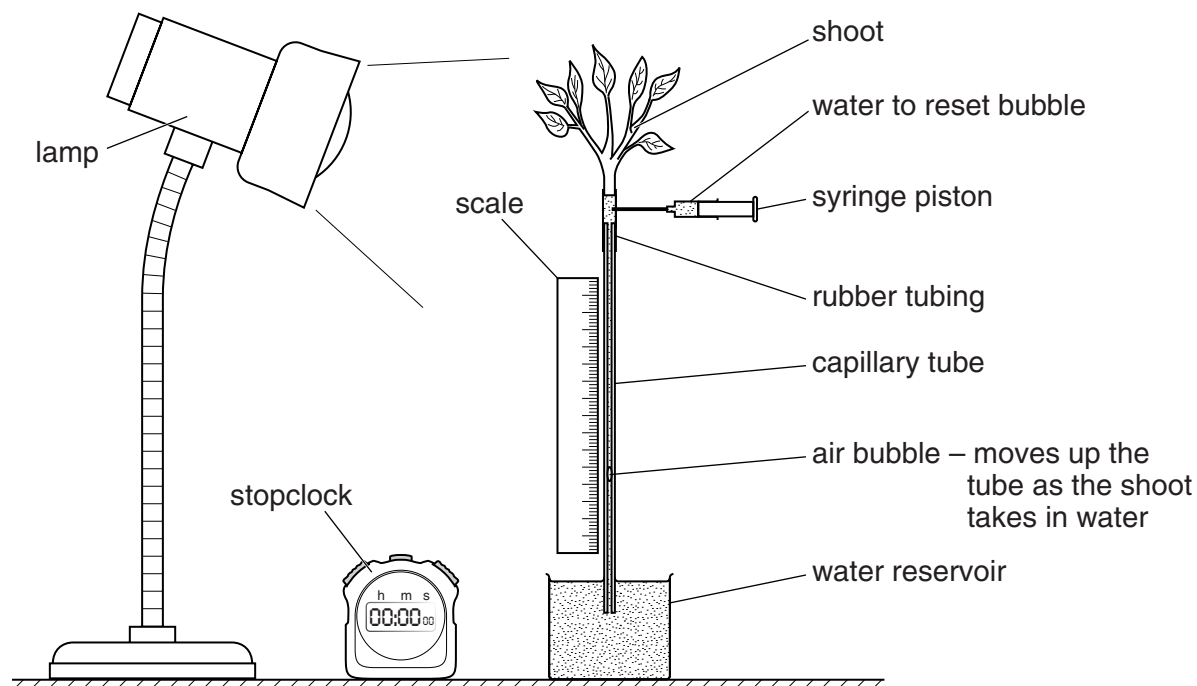
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3

2 Look at the diagram.

The apparatus can be used to investigate the rate of transpiration.

Transpiration is the loss of water from the leaves.



(a) Louise measures the rate of transpiration.

Describe how she could use the apparatus to investigate how **light intensity** affects the rate of transpiration.

.....

.....

.....

.....

.....

..... [3]

(b) Transpiration involves the movement of water.

Translocation also involves moving substances through the plant.

Write down **two** ways translocation is different from transpiration.

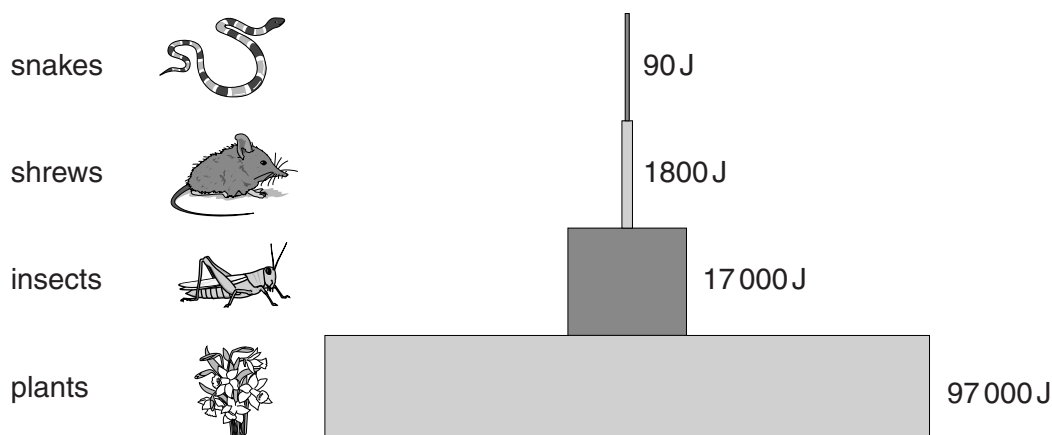
1

2 [2]

[Total: 5]
Turn over

3 Look at the diagram.

It shows the amount of energy at each stage of a food chain.



(a) The percentage energy transfer from the plants to the insects is 17.5%.

(i) Calculate the percentage energy transfer from the shrews to the snakes.

Show your working.

.....

answer % [2]

(ii) Not all the energy is transferred from one level to the next.

Describe **one** reason why.

.....
 [1]

(b) The diagram shows a food chain from farmland.

One year the farmer sprays the plants with insecticides.

(i) What effect will the insecticides have on the **shrew** population?

.....

Explain your answer.

..... [1]

(ii) Is the farmer an organic farmer?

Explain your answer.

..... [1]

[Total: 5]

- 4 Ceri grows tomato plants.

Look at the picture of her tomato plants.



- (a) Her plants need water.

Put ticks (✓) in the boxes next to **two** correct statements about water in plants.

water is absorbed through the waxy cuticle

☐

water evaporates from the leaves

☐

water enters the leaves through pores

☐

water is needed to stop the plant wilting

☐

water is turned into oxygen during respiration

☐

[2]

- (b) Ceri's tomatoes become covered in greenfly.

She uses ladybirds to eat the greenfly.

What sort of control is this?

..... [1]

- (c) Ceri picks too many tomatoes to eat at once.

She puts some tomatoes in the freezer to preserve them.

Write down **two other** ways Ceri could preserve tomatoes at home.

1

2 [2]

[Total: 5]

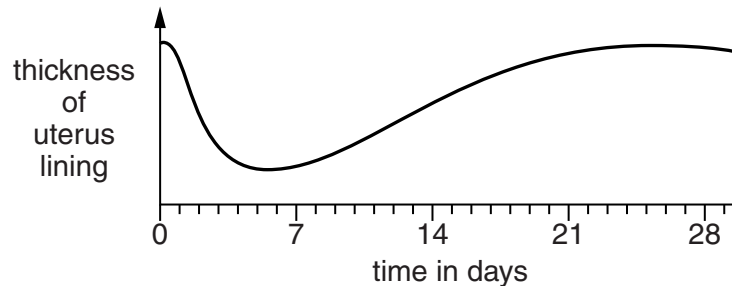
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Section B – Module B5

- 5 Linda is trying to get pregnant.

The graph shows the changes taking place in Linda's uterus during her menstrual cycle.



- (a) What is happening to the lining of Linda's uterus during days 0 to 5?

..... [1]

- (b) Linda's body produces one egg during each cycle.

The egg is most likely to be released and fertilised at about day 14.

- (i) Where in Linda's body are eggs produced?

..... [1]

- (ii) What is meant by fertilisation?

..... [1]

- (c) Linda is finding it difficult to get pregnant.

She goes to a clinic and finds out the problem.

She meets other women who have other infertility problems.

			
Linda has blocked fallopian tubes	Lucy makes eggs but her uterus cannot hold a growing baby	Helen has had her ovaries removed	Joanna does not produce an egg every month

Write down the name of the woman who could use FSH as a treatment for infertility.

..... [1]

[Total: 4]

Turn over

8

6 Barry is getting pain in his hip and so he goes to the doctor.

(a) The doctor takes an image of the bones in Barry's hip.



(i) What type of machine did the doctor use to take this image?

..... [1]

(ii) What type of joint is the hip joint?

..... [1]

(iii) Write down what holds bones together in the hip joint.

..... [1]

(b) The doctor can see that Barry's hip bone is not fractured.

He wants to work out how likely it is to fracture in the future.

The doctor measures the density of Barry's bones.

They score **-1** on a special bone density scale.

He asks Barry about risk factors that might make a fracture more likely.

He finds out that Barry has **2** risk factors.

The doctor uses this table to find out the **percentage risk** of Barry having a fracture in the next ten years.

	percentage risk of a fracture					
	bone density -4	bone density -3	bone density -2	bone density -1	bone density 0	bone density 1
0 risk factors	27	15	10	7	6	5
1 risk factor	37	22	14	10	9	7
2 risk factors	49	30	20	15	12	10
3 risk factors	62	41	27	20	17	15
4 risk factors	73	52	36	27	23	20

What is the percentage risk for Barry?

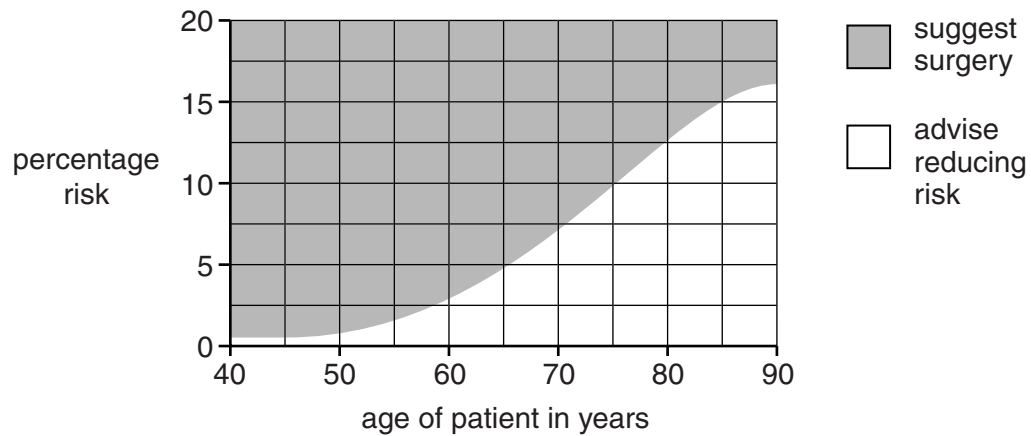
..... [1]

10

(c) When doctors work out the percentage risk they have to advise the patient.

They can suggest surgery on the hip or tell the patient to try to reduce their risk factors.

This graph is used to make the decision.



(i) Barry is 72 years old.

Draw lines on the graph to work out the advice Barry's doctor would give.

What action does Barry's doctor advise?

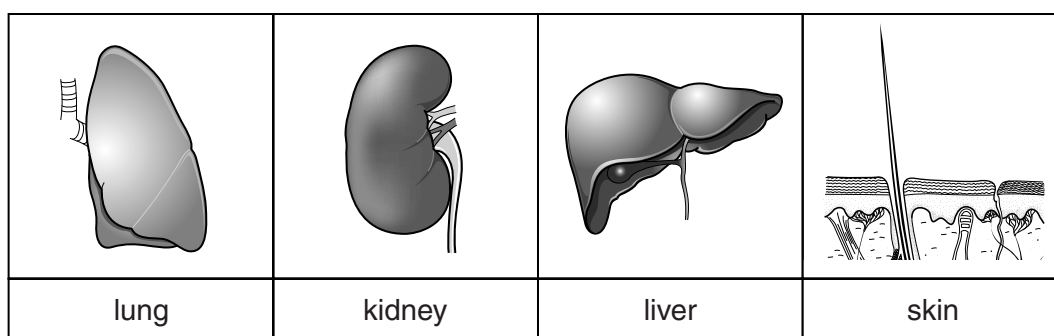
..... [1]

(ii) Describe how the advice a doctor gives changes as a patient gets older.

.....
 [1]

[Total: 6]

7 The drawings show some of the main excretory organs in the body.



(a) (i) Which of these organs excretes carbon dioxide from the body?

..... [1]

(ii) The carbon dioxide that is excreted has been produced by respiration.

Explain how respiration is different from breathing.

.....

 [2]

(b) Which of the four organs is the **main** excretory organ for urea?

..... [1]

(c) The lungs are connected to the outside by a long tube.

This connection to the outside means that the lungs can be easily damaged.

Write down **one** condition or disease that can permanently damage the lungs.

..... [1]

[Total: 5]

12

8 Different animals have different types of blood system.

They also have different ways of exchanging gases.

(a) Draw lines to link each **type of blood system** with the **animal** that uses it.

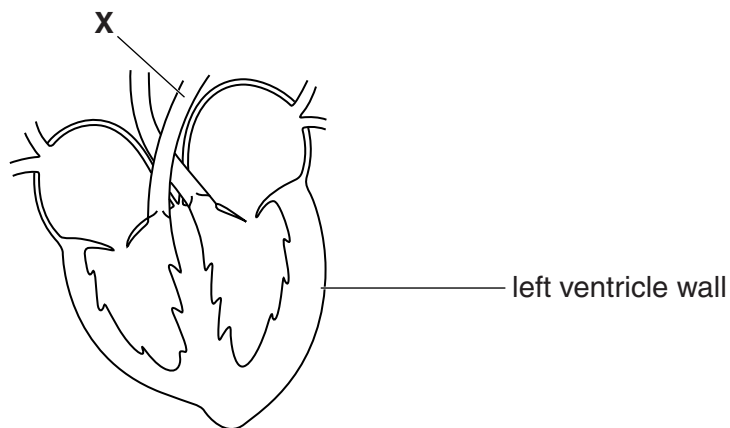
Then draw lines to link each **animal** with the **way that it exchanges gases**.

One of the lines has been drawn for you.

type of blood system	animal	way that it exchanges gases
open	amoeba	through moist body surface
closed	human	using lungs
no blood system	insect	through holes in body surface

[2]

(b) The diagram shows a human heart.



(i) Name the part that is labelled X.

.....

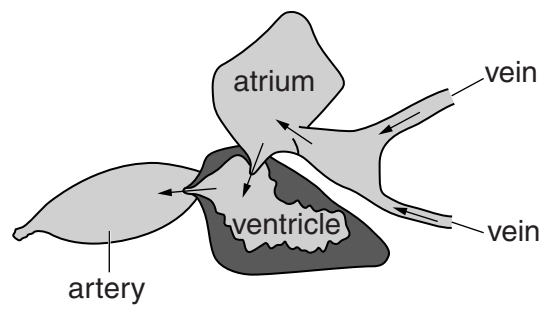
[1]

(ii) What is the left ventricle wall made of?

..... [1]

13

(c) The diagram shows a fish heart.



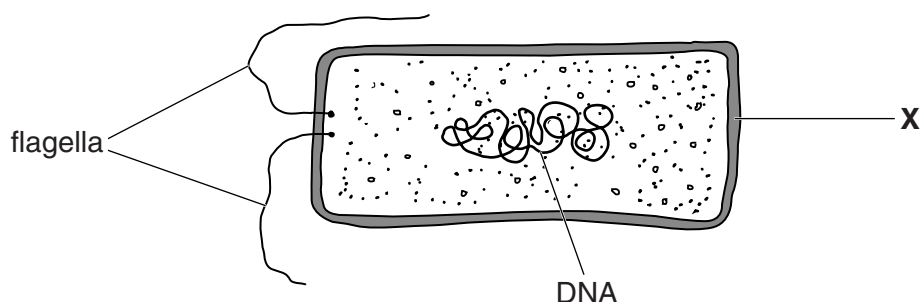
Write down **one** way that a fish heart is different from a human heart.

..... [1]

[Total: 5]

Section C – Module B6

- 9 (a) The diagram shows a bacterial cell.



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

..... [1]

- (ii) What is the job of the flagella?

..... [1]

- (iii) Write down **one** feature found in a **human** cell that is **not** found in a bacterial cell.

..... [1]

- (b) Some bacteria cause disease.

Look at the list of diseases.

chickenpox

influenza

smallpox

tuberculosis

- (i) Which disease is caused by bacteria?

..... [1]

- (ii) Which disease can be treated with antibiotics?

..... [1]

- (iii) When bacteria enter the human body they can multiply very rapidly.

This is because they can reproduce every 20 minutes.

If 100 bacteria enter the body, how many will there be after one hour?

answer [1]

15

- (c) Some bacteria living in soil are important because they help recycle chemical elements such as nitrogen.

Dead leaves contain nitrogen compounds.

- (i) What do bacteria do to dead leaves to release nitrogen compounds?

..... [1]

- (ii) Nitrogen compounds are minerals.

What type of living organism needs to take in minerals from the soil?

..... [1]

[Total: 8]

16
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- 10 (a) Bobby has been eating a hot dog and has tomato sauce stains on his shirt.

He puts his shirt in the washing machine.

He adds some biological washing powder.

He sets the machine to wash at 60 °C.

When he takes his shirt out it is still slightly stained.

Bobby's sister tells him he did **not** wash his shirt on the correct setting.

Why was the setting Bobby used incorrect?

.....

Explain your answer.

.....

..... [2]

- (b) Bobby has diabetes.

- (i) He checks his urine to see if it contains glucose sugar.

How can Bobby check his urine to see if it contains glucose?

.....

.....

..... [2]

- (ii) Bobby controls his diabetes using insulin injections.

He uses human insulin made by **genetically engineered** bacteria.

Describe how these bacteria are genetically engineered.

.....

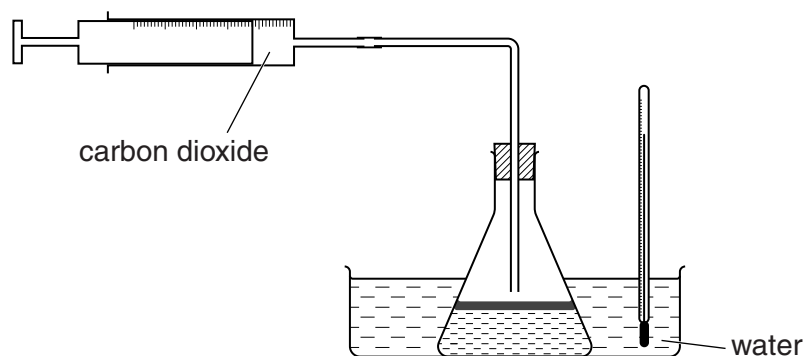
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..... [2]

[Total: 6]

- 11 (a) Liz and Paul are investigating fermentation by yeast.

This is the equipment they use.



They change the temperature of the water.

For each temperature, they measure how much carbon dioxide is collected in five minutes.

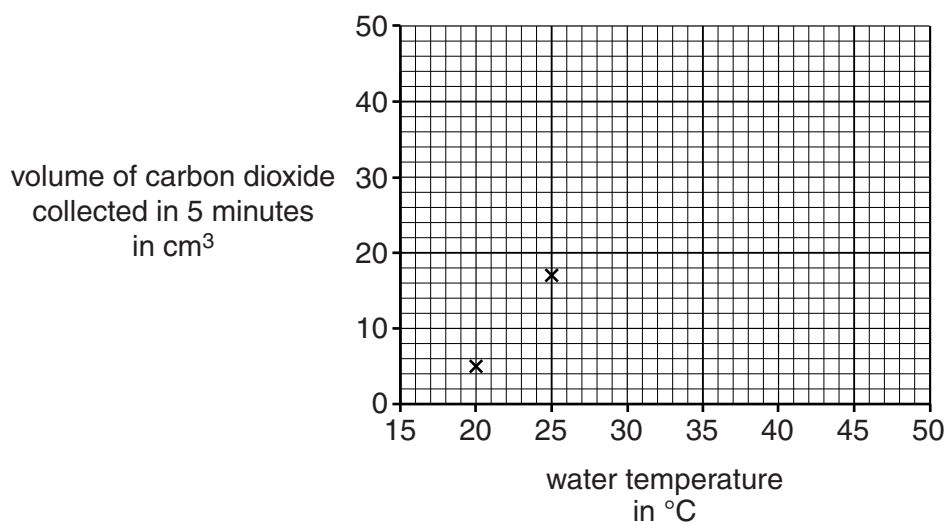
The table shows their results.

water temperature in °C	20	25	30	35	40
volume of carbon dioxide collected in 5 minutes in cm ³	5	17	38	35	6

- (i) Complete the graph to show their results.

Plot all the points and draw the best curve.

The first two points have already been plotted.



[2]

19

- (ii) Paul says that the results show that the best temperature for fermentation by yeast is **exactly** 30°C.

Liz disagrees.

Who is correct?

Explain your answer.

.....
 [1]

- (iii) Fermentation by yeast is used in the brewing industry to produce alcohol.

In John's brewery, fermentation takes place at 25°C. This is **not** the temperature at which fermentation happens fastest.

Suggest why 25°C may be the best temperature for John to choose.

.....
 [1]

- (b) In the brewing industry, different alcoholic drinks are made from different sources.

- (i) Draw straight lines to join each drink with its source.

drink	source
beer	apples
cider	barley
wine	grapes

[1]

- (ii) Each source provides the same substance that yeast breaks down to make alcohol.

Write down the name of this substance.

..... [1]

[Total: 6]

END OF QUESTION PAPER

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