CCEA GCSE SCIENCE: DOUBLE AWARD (MODULAR)

SCIENCE



EXAM QUESTION PACK

END OF MODULE TEST A FOUNDATION TIER GDA01 PAPERS

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Rewarding Learning

General Certificate of Secondary Education
2011–2012

Science: Double Award (Modular)

Living Organisms and the Processes of Life
End of Module Test

Foundation Tier

[GDA01]

TUESDAY 15 MAY 2012
9.15 am–10.00 am

MARK SCHEME

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				AVAILABLE MARKS
1	**(a)**	Benedict's	[1]	
	(b)	Food sample + reagent in test tube (placed in beaker of water); Heat/boil	[2]	
	(c)	Blue → orange red/red/orange/brick-red (not brown)	[1]	4
2	**(a)**	Palisade/mesophyll cell	[1]	
	(b)	absorbs *light* energy; for *photosynthesis*	[2]	
	(c)	Any **two** from		

Plant cell	**Sperm cell**
Has cell wall	No cell wall
Has chloroplasts	No chloroplasts
Has large vacuole	Has no large vacuole
No tail	Has tail
No head	Has head

[2] 5

3	**(a)**	× 40	[1]	
	(b)	Any **three** from: Place strip of epidermis on (microscope) slide; Add drop of iodine stain/methylene blue/water; Lower on coverslip; At an angle to avoid trapping air bubbles; Secure with clips;	[3]	4

				AVAILABLE MARKS
4	**(a)**	Assimilation ; Absorption ; Egestion	All **three** correct = 2 marks 1 correct = 1 mark [2]	
	(b)	Amylase breaks down/digests starch; into glucose/maltose/sugar; Present both in mouth and ileum to ensure all starch digested/starch digestion is not completed in the mouth or to continue digestion. [3]		5
5	**(a)**	Destarch the plant/place in dark cupboard for period of time	[1]	
	(b)	Blue-black/starch present	[1]	
	(c)	Respiration/energy/cellulose/protein/fats/oils/sucrose/chlorophyll	[1]	3
6	**(a)**	Any **two** from: Same sterilisation temperature used; Same concentration of broth; Same volume of broth; Keep flasks at same temperature; Same type of broth used	[2]	
	(b)	Bacteria caught/trapped in the swan neck/bacteria cannot enter the broth	[1]	3
7	**(a)**	Root hair cell	[1]	
	(b)	Minerals/named mineral/nitrates/Ca/Mg	[1]	
	(c)	Stoma/stomata	[1]	
	(d)	Carbon dioxide/CO_2	[1]	4

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				AVAILABLE MARKS
8	**(a)**	Respiration/energy release	[1]	
	(b)	Any **two** from: Insulin released; causes glucose to be converted to glycogen; in the liver; glucose to be converted to fat; **more/increased** respiration of glucose; **more/increased** uptake into cells	[2]	
	(c)	Hepatic portal vein	[1]	4
9	**(a)**	Any **three** from: Blockage in artery/clot; Less blood flow through artery; so less glucose/oxygen; less respiration/energy; for heart muscle to contract/heart muscle dies	[3]	
	(b)	Nicotine	[1]	4
10	**(a)**	Keep trachea open/prevent it from collapsing/support	[1]	
	(b)	Any **two** from: These are the *intercostal muscles*; *Contract* during inspiration; so ribs move up or out; Increased volume/decreased pressure/lungs expand	[2]	
	(c)	Blood *capillaries*	[1]	4
11	**(a)**	A – Right atrium B – Aorta	[2]	
	(b)	C is deoxygenated/D is oxygenated; C has more CO_2/D has low CO_2	[2]	4

			AVAILABLE MARKS
12	**(a)**	Any **two** from: Bacteria/microorganisms *caught in the mucus*/germs/dust caught in mucus; Wafted by ciliated epithelial cells/moved by cilia/hairs; Swallowed; Killed by hydrochloric acid in stomach [2]	
	(b)	Any **four** from: *Antigens* on surface of microorganism; stimulate the production of *antibodies*; by lymphocytes (white blood cells); antibodies join with antigens/or bacteria/or virus; forming a clump; This is ingested/digested; by the phagocytes/phagocytosis [4]	6
		Total	**50**

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Rewarding Learning

Centre Number

71	

Candidate Number

General Certificate of Secondary Education
2011–2012

Science: Double Award (Modular)

Living Organisms and the Processes of Life

End of Module Test

Foundation Tier

A

[GDA01]

GDA01

MONDAY 27 FEBRUARY 2012
9.30 am–10.15 am

TIME

45 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all thirteen** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 50.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
Total Marks	

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Examiner Only	
Marks	Remark

1 Vitamins and minerals are needed as part of a balanced diet.

(a) Name the vitamin and mineral that are needed for healthy bone formation.

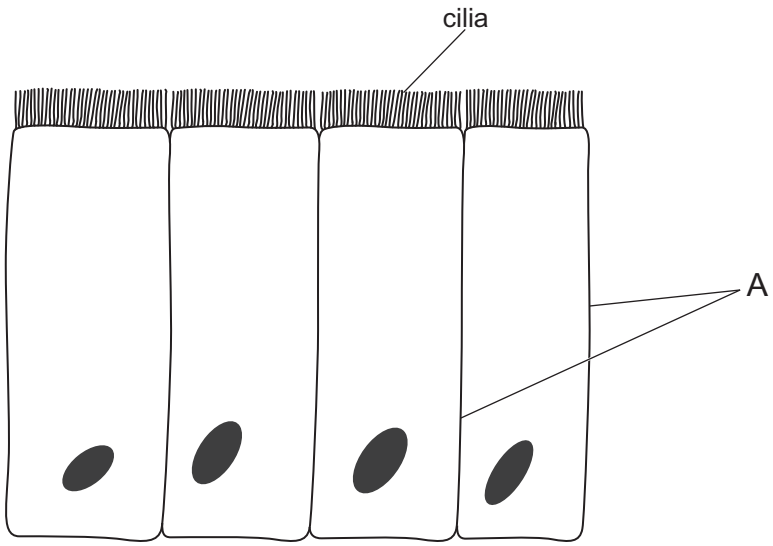
vitamin _____

mineral _____ [2]

(b) Explain how the mineral iron is used in the body.

_____ [1]

2 The diagram shows ciliated epithelium cells.



(a) Name the part of the cell labelled A.

_____ [1]

(b) Name **one** place where ciliated epithelium cells are found in the body.

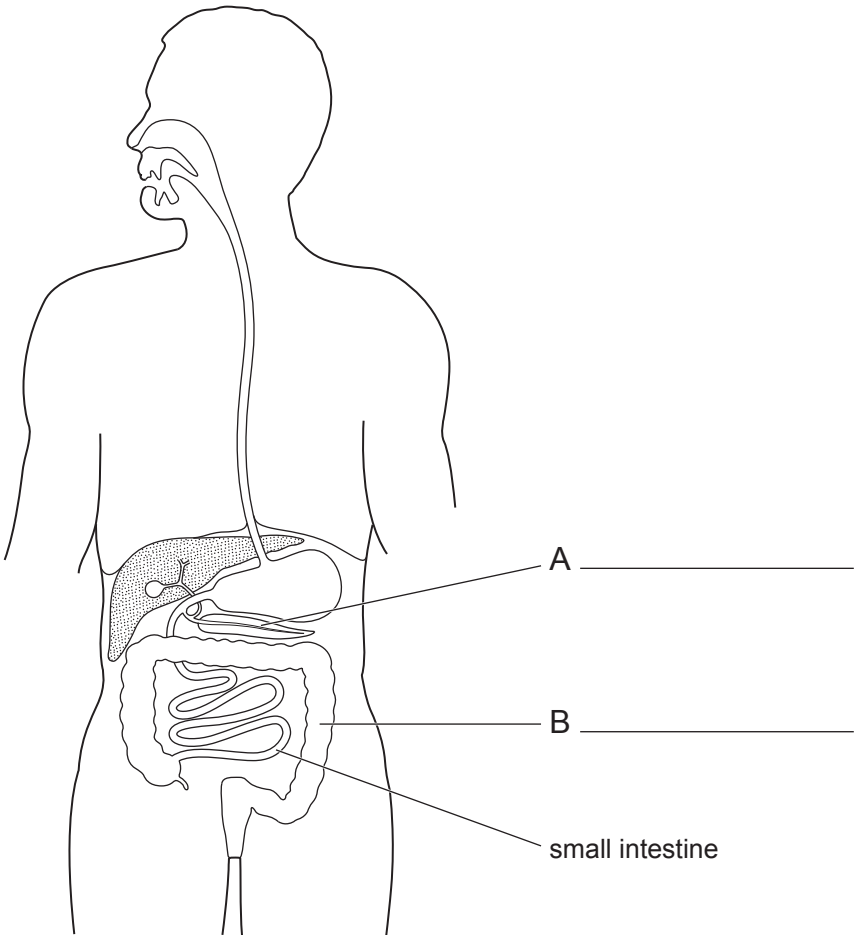
_____ [1]

(c) State **one** difference in the structure of the ciliated cell (apart from presence of cilia) and a typical plant cell.

_____ [1]

Examiner Only	
Marks	Remark

3 The digestive system is shown in the diagram.



(a) On the diagram, label parts A and B. [2]

(b) Describe and explain **one** way in which the small intestine is adapted for its function.

_____

_____

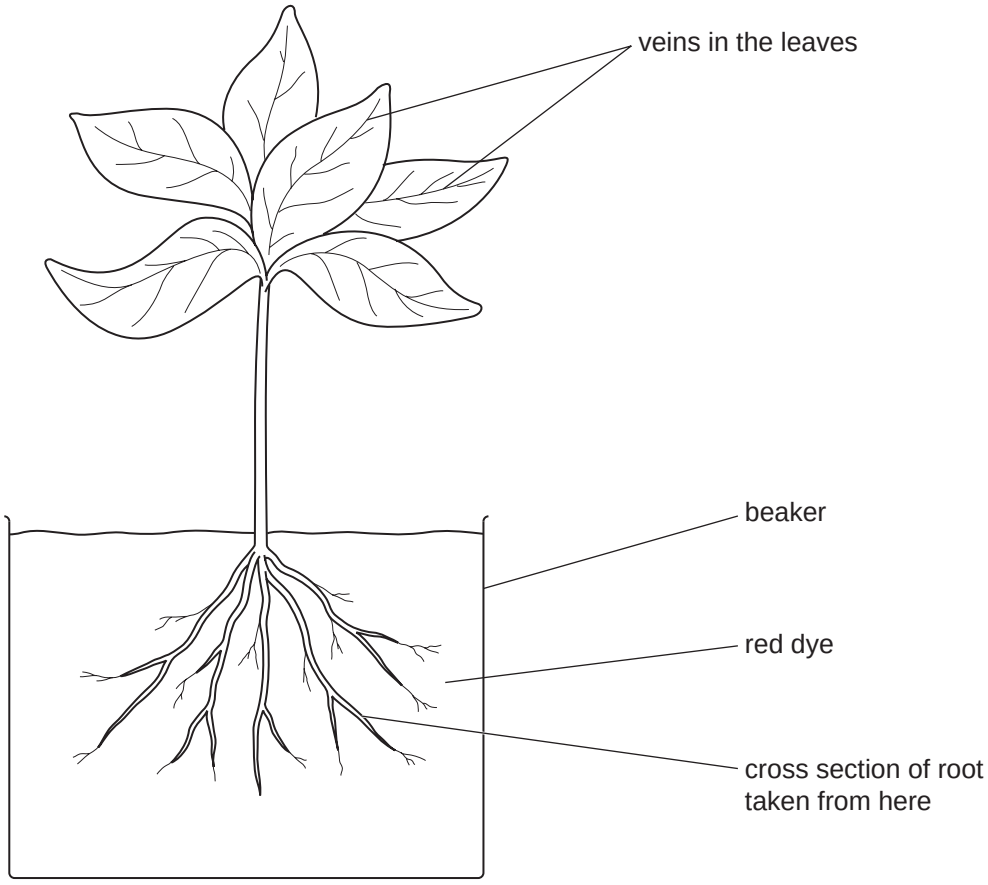
_____ [2]

Examiner Only	
Marks	Remark

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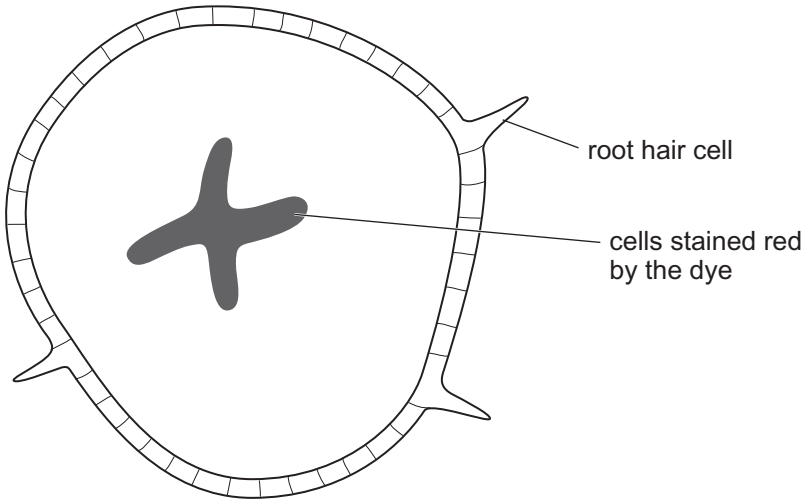
Examiner Only	
Marks	Remark

4 A student set up an experiment where he placed the root of a plant in a solution of water with a red dye added to it.



After 24 hours, he cut a very thin cross section of the root and examined it using the microscope.

He drew a diagram of his observations.



(a) Name the process by which the water with the red dye travels across to the centre of the root.

_____ [1]

(b) Name the type of cells in the centre of the root that would be stained red.

_____ [1]

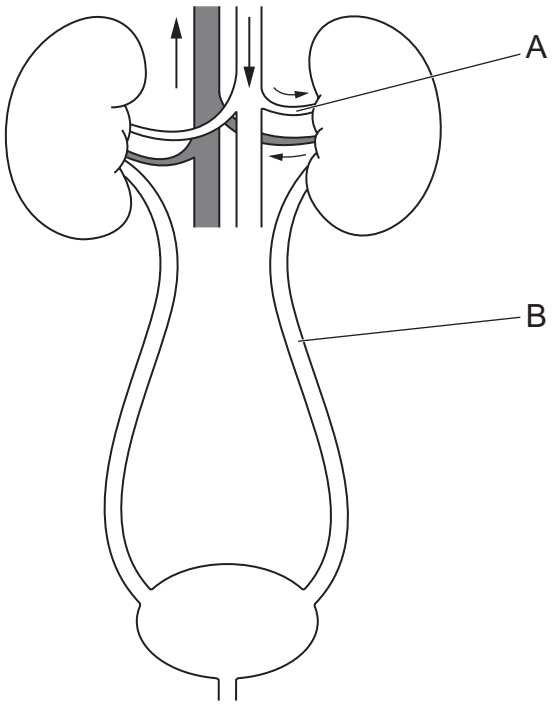
(c) Explain why the red dye would be seen later in the veins of the leaves.

_____ [1]

Examiner Only	
Marks	Remark

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5 The diagram shows part of the excretory system.



(a) Name blood vessel A.

_____ [1]

(b) Name the liquid carried in tube B.

_____ [1]

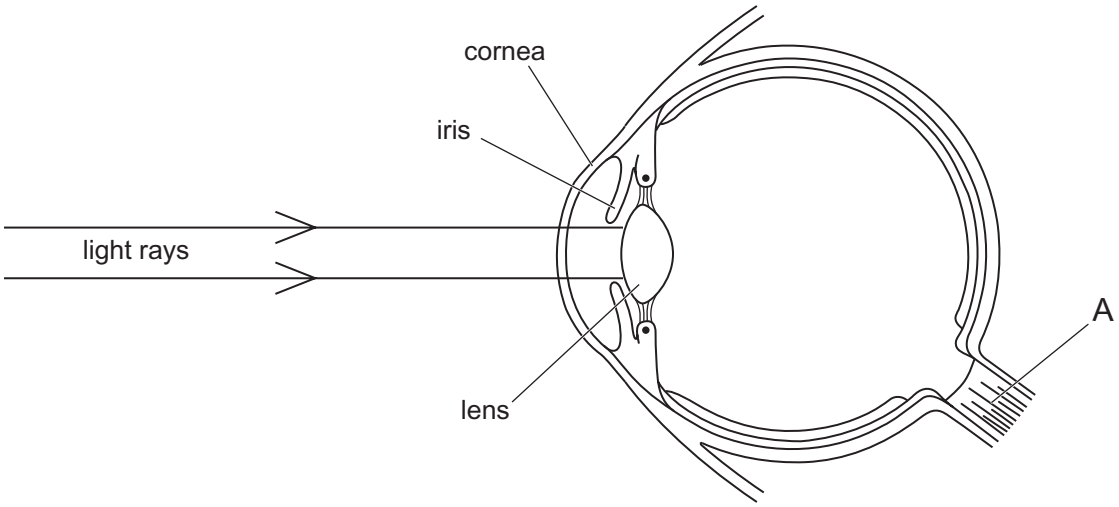
(c) As well as removing waste (urea) from the blood, give **one** other function of the kidney.

_____ [1]

Examiner Only	
Marks	Remark

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6 The diagram shows the eye.



(a) Name part A.

_____ [1]

(b) What is the function of the iris?

_____ [1]

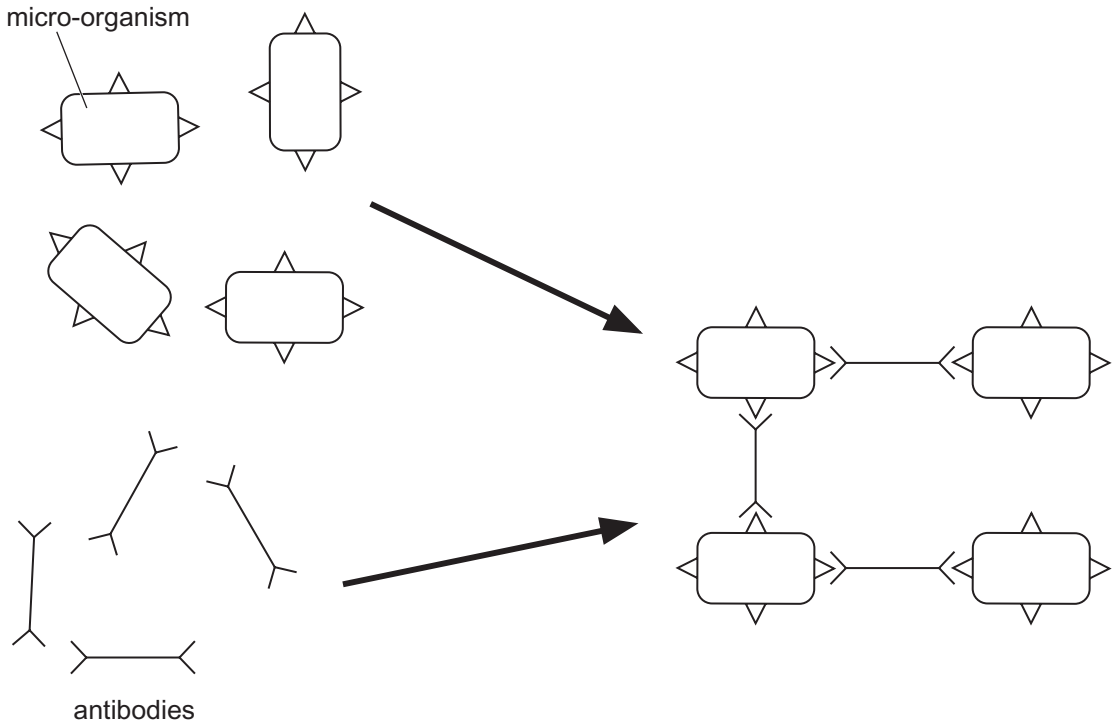
(c) Continue the light rays to show where they are focused. [1]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

7 The diagram shows the effect of antibodies, produced by the body, on micro-organisms.



(a) Use the diagram and your understanding to describe the role of antibodies in defence against disease.

_____

_____

_____

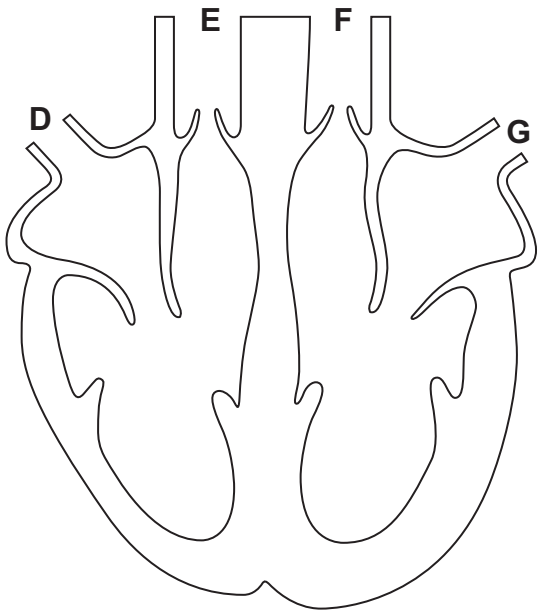
_____ [3]

(b) Name the type of immunity shown in the diagram.

_____ [1]

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8 The diagram shows a section through the heart.



(a) Which of the blood vessels, **D**, **E**, **F** or **G**:

(i) carries oxygenated blood back to the heart?

[1]

(ii) carries deoxygenated blood to the lungs?

[1]

(b) Draw arrows on the diagram above to show the direction of blood flow through **each side** of the heart. [2]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

9 Gaseous exchange takes place in the lungs.

(a) State two ways in which inhaled air is different from exhaled air.

1. _____

2. _____ [2]

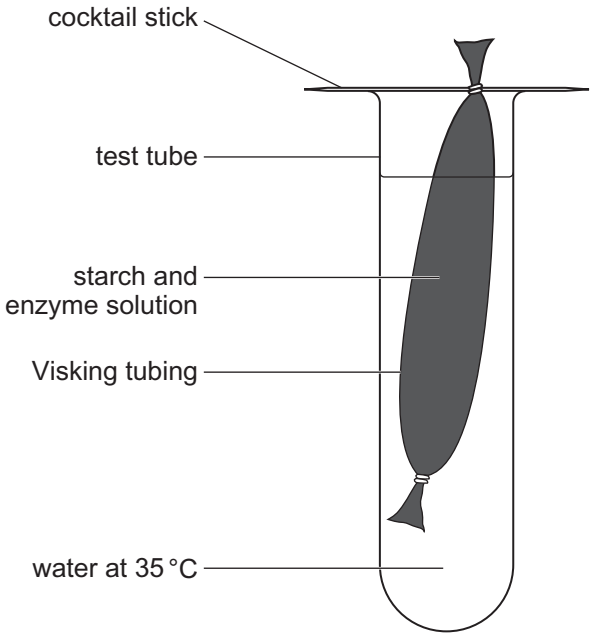
(b) List two features of the alveoli, in the lungs, that make them efficient gas exchange surfaces.

1. _____

2. _____ [2]

10 Visking tubing is a partially permeable membrane. Small molecules can pass through the pores of the membrane but large molecules will not pass through.

The apparatus was set up as shown in the diagram with starch and enzyme solution inside the Visking tubing.



The water in the test tube was tested for the presence of starch and sugar at the start of the experiment and again after one hour. The results of these tests are shown in the table.

	At start	After 1 hour
Starch	Absent	Absent
Sugar	Absent	Present

Explain the results of this experiment for:

(a) starch

_____ [1]

(b) sugar

_____

_____

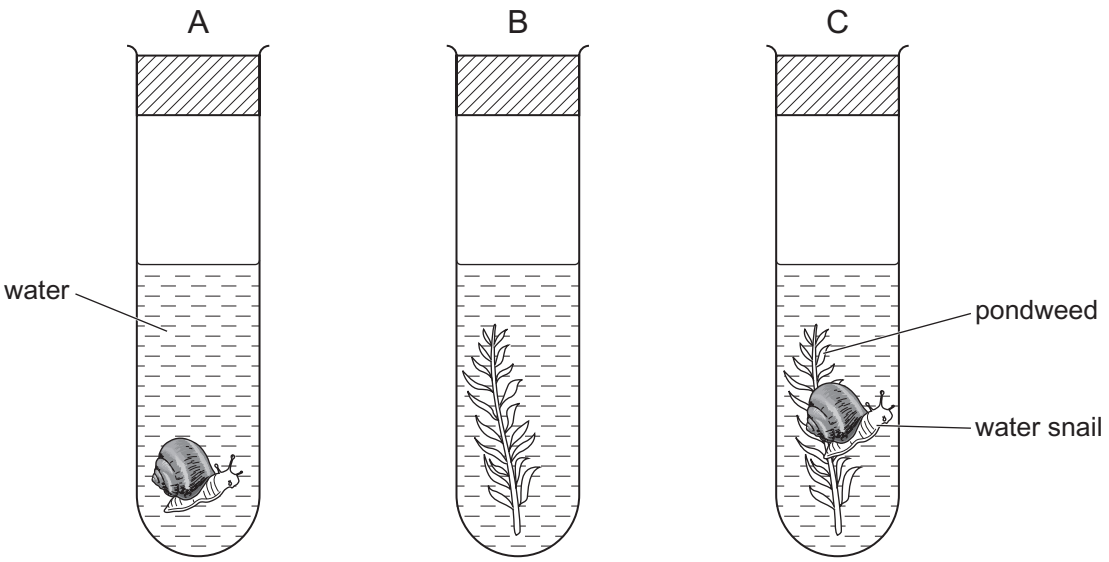
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_____ [3]

Examiner Only

Marks	Remark

11 A student sets up an experiment as shown in the diagram.



The tubes were left in the light for four hours. They were then tested for carbon dioxide concentration.

Which tube would have had the highest carbon dioxide concentration after four hours? Explain your answer.

Tube _____

Explanation _____

_____

_____

_____

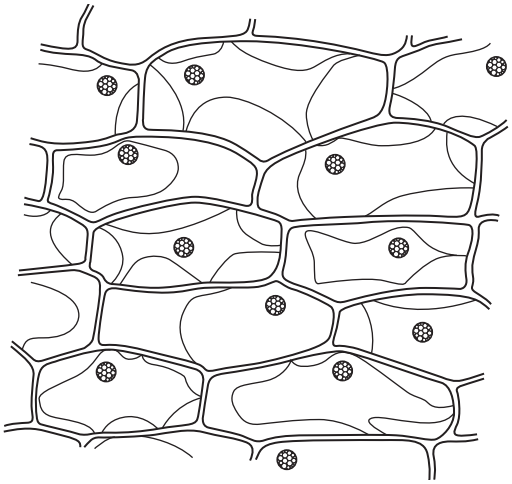
_____

_____ [4]

Examiner Only

Marks	Remark

12 The diagram shows onion epidermal cells that were placed in a strong sugar solution.



Describe and explain what has happened to the cells.

_____

_____

_____

_____

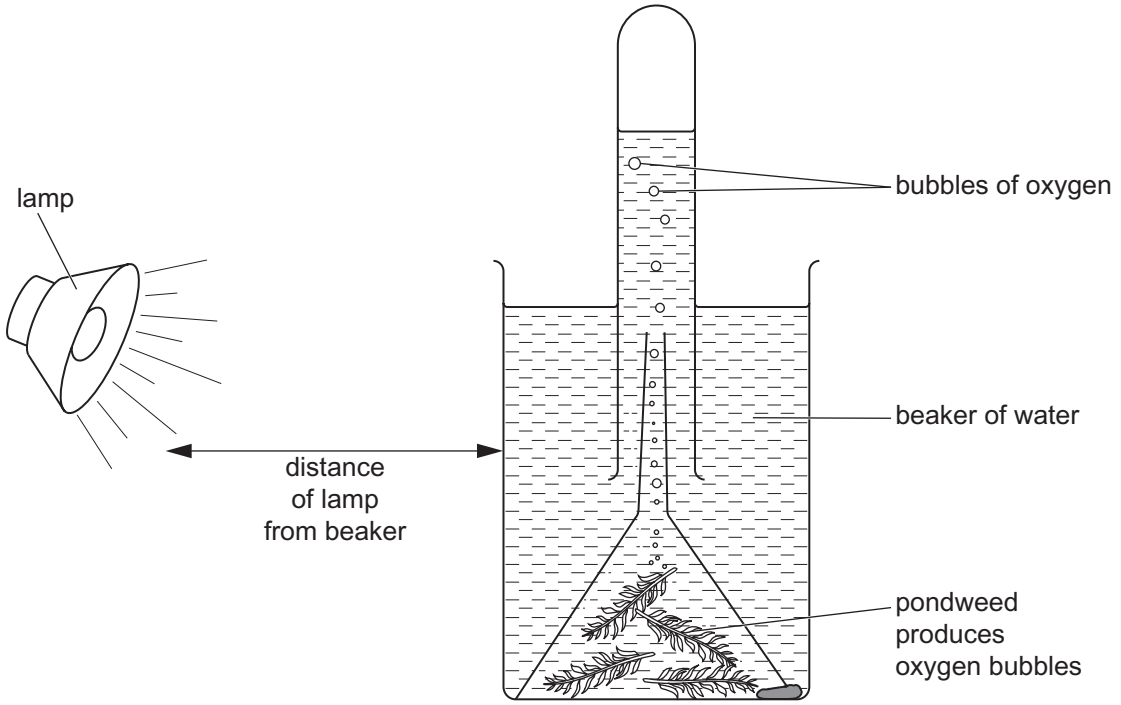
_____

_____ [4]

Examiner Only	
Marks	Remark

13 An experiment was set up to investigate the effect of light intensity on photosynthesis.

Examiner Only	
Marks	Remark



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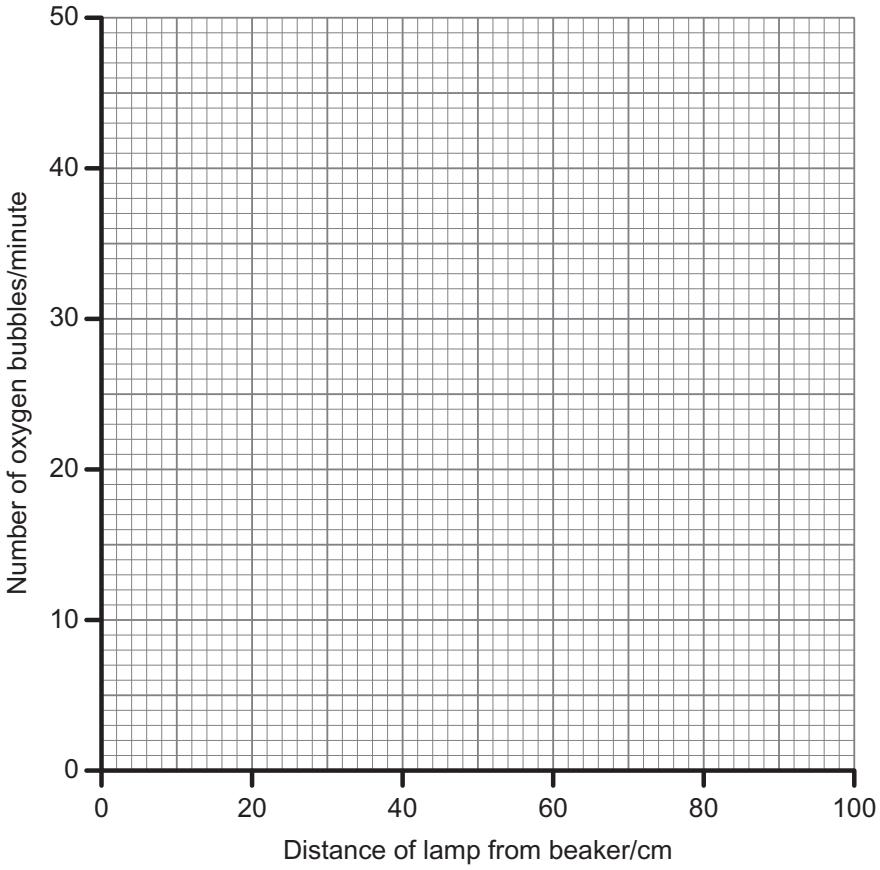
At a certain light intensity, the number of oxygen bubbles released in one minute was counted.

The experiment was repeated with the lamp placed at different distances from the beaker. The results are shown in the table.

Distance between lamp and beaker/cm	Number of oxygen bubbles/ minute
20	48
40	46
60	30
80	10
100	10

Examiner Only	
Marks	Remark

(a) Plot a line graph of these results.



[2]

(b) Use your graph to estimate the number of oxygen bubbles released per minute if the lamp was 50 cm away from the beaker.

_____ bubbles/minute [1]

(c) Describe the trend shown in the graph.

_____

_____ [1]

(d) **(i)** Describe **two** measures you could take to control variables in this experiment.

_____

_____

_____ [2]

(ii) How could you improve the reliability of this experiment?

_____ [1]

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Rewarding Learning

General Certificate of Secondary Education
2011–2012

Science: Double Award (Modular)

Living Organisms and the Processes of Life

End of Module Test

Foundation Tier

A

[GDA01]

MONDAY 27 FEBRUARY 2012
9.30 am–10.15 am

MARK SCHEME

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				AVAILABLE MARKS
1	**(a)**	vitamin D calcium	[2]	
	(b)	iron used to make haemoglobin/used in red blood cells	[1]	3
2	**(a)**	cell membrane/plasma membrane	[1]	
	(b)	respiratory passages/oviduct/nose/throat (not lungs)	[1]	
	(c)	ciliated cell has no cell wall/no chloroplasts/no large vacuole/plant cell has vacuole	[1]	3
3	**(a)**	A – pancreas B – large intestine/colon	[2]	
	(b)	it is long/has folds; thin walls/one cell thick for absorption gives large surface area for absorption/time for all food to be digested has villi/microvilli → large surface area good blood supply → for diffison or absorption	[2]	4
4	**(a)**	usmosis	[1]	
	(b)	xylem	[1]	
	(c)	travelled in/xylem in leaves/pulled up by transpiration into veins	[1]	3
5	**(a)**	renal artery	[1]	
	(b)	urine (not urea)	[1]	
	(c)	osmoregulation/control of water level	[1]	3
6	**(a)**	optic nerve/nerve leading to brain (not nerve on its own)	[1]	
	(b)	controls amount of light that enters eye	[1]	
	(c)	both rays to meet on the retina	[1]	3

			AVAILABLE MARKS
7	**(a)**	any **three** from: antigen (on surface of micro-organism); antibodies made to match antigen/antibodies lock onto the micro-organism/bacteria lock onto antigen; (not disease) produce clump; stops micro-organism spreading **or** makes easier to engulf [3]	
	(b)	Active [1]	4
8	**(a)**	**(i)** G [1]	
		(ii) E [1]	
	(b)	appropriate direction of arrows through each side of the heart: from D through to E; from G through to F in heart [2]	4
9	**(a)**	Any **two** from: (assume inhaled) • inhaled air has **more** oxygen **or** converse: exhaled has less O_2 • inhaled air has **less** carbon dioxide **or** converse • inhaled air has **less** water vapour **or** converse • inhaled air is colder **or** converse [2]	
	(b)	Any **two** from: • large surface area/lots of them • good blood supply/capillaries close by • moist • short diffusion distance/thin walls of alveoli or capillaries/very thin • permeable [2]	4
10	**(a)**	starch is too large to pass through the Visking tubing/membrane [1]	
	(b)	starch (in the tubing) broken down to sugar; by amylase; sugar small enough to escape from the tubing (not conc. gradient) [3]	4
11		tube A; snail respires/produces carbon dioxide; in tubes B/C plant takes in carbon dioxide; by photosynthesis in tube A no pondweed to absorb CO_2 [4]	4

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		AVAILABLE MARKS
12	description: Cells are plasmolysed/cell membrane has pulled away from cell wall/cells are flaccid/cells shrivel/vacuole shrunk; explanation (any **three** from): • lower water concentration outside cells/more water inside cell • water moves out/of cells • by osmosis • across a partially/selectively/semi-permeable membrane (not solution passes out) [4]	4
13	**(a)** all points correctly plotted; points joined with straight lines; [2] • vertical lines = 1 mark for points • not line of best fit • –1 if line drawn from origin	
	(b) 38–40 bubbles (consequential marking according to graph) [1]	
	(c) as the light intensity decreases, there are less oxygen bubbles produced/less photosynthesis **or** closer lamp is to beaker → more O_2 bubbles/more photosynthesis **or** converse [1]	
	(d) **(i)** Control variables Any **two** from: • control temperature (using a heat shield/water bath) (not same size beaker) • same concentration of carbon dioxide in water/same hydrogen carbonate concentration in water • same pH in water • allow 5 minutes equilibration at each distance/settle • same piece/amount of pondweed • same volume of water • same bulb/strength bulb [2]	
	(ii) reliability – do repeats at each distance/repeat experiment (not repeat at different distance, not repeat with different pondweed) [1]	7
	Total	**50**

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Rewarding Learning

Centre Number

71	

Candidate Number

General Certificate of Secondary Education
2011–2012

Science: Double Award (Modular)

Living Organisms and the Processes of Life
End of Module Test
Foundation Tier

A

[GDA01]

GDA01

TUESDAY 8 NOVEMBER 2011
1.30 pm–2.15 pm

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
Total Marks	

TIME

45 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all fifteen** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 50.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

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Examiner Only	
Marks	Remark

1 Abuse of drugs can harm individuals and society.

(a) Describe **two** ways in which excessive alcohol use over a long time can cause harm to an **individual's** health.

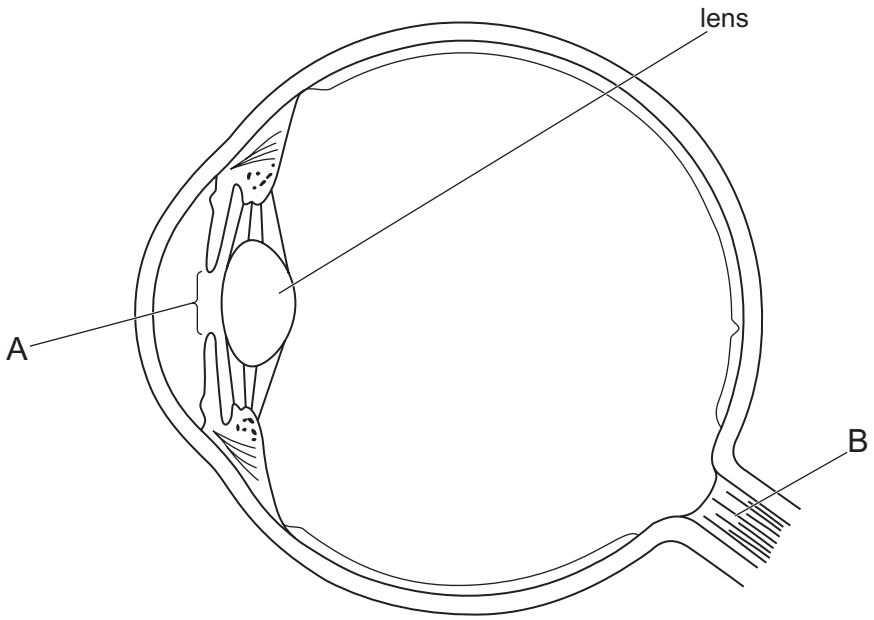
_____

_____ [2]

(b) Describe the effects of a hallucinogen on a person.

_____ [1]

2 The diagram shows a section through an eye.



(a) Name the parts labelled A and B.

A _____

B _____ [2]

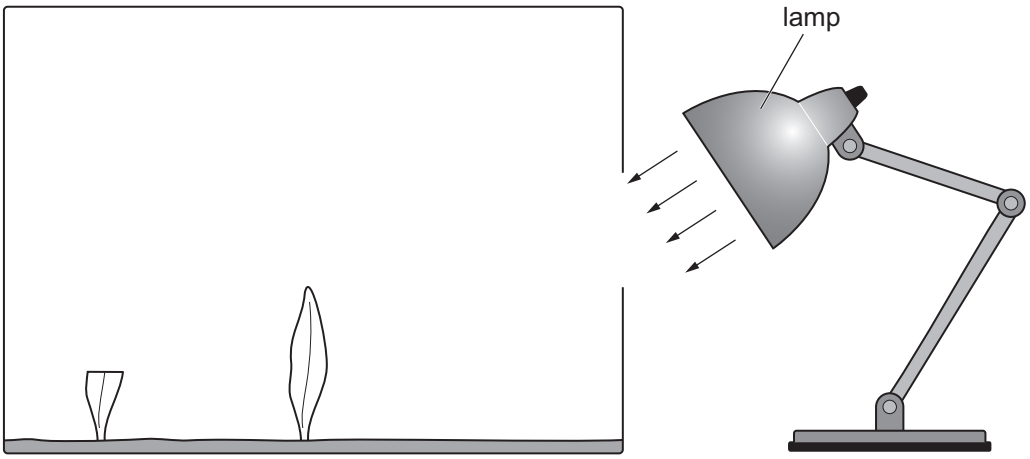
(b) What is the function of the lens?

_____ [1]

Examiner Only	
Marks	Remark

3 This experiment was set up to investigate how barley seedlings respond to light coming from one side.

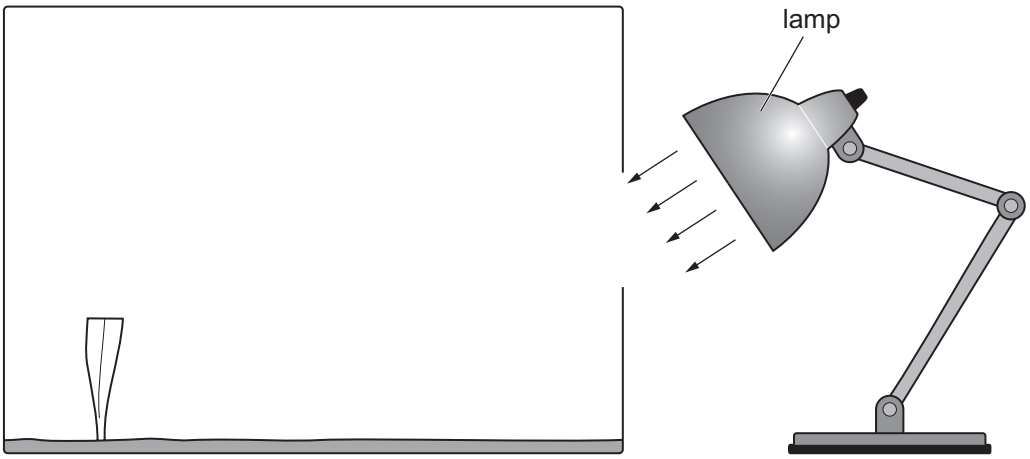
at start



barley seedling with tip removed

barley seedling

after 3 days



(a) In the bottom diagram, sketch the result you would expect for the barley seedling nearest the lamp. [1]

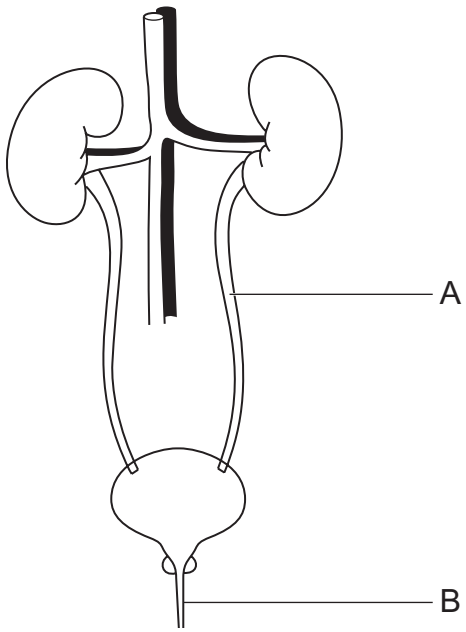
(b) What is the name of this growth response?

_____ [1]

(c) Name the type of substance involved in this growth response.

_____ [1]

4 The diagram shows part of the human excretory system.



(a) Name parts A and B.

A _____

B _____ [2]

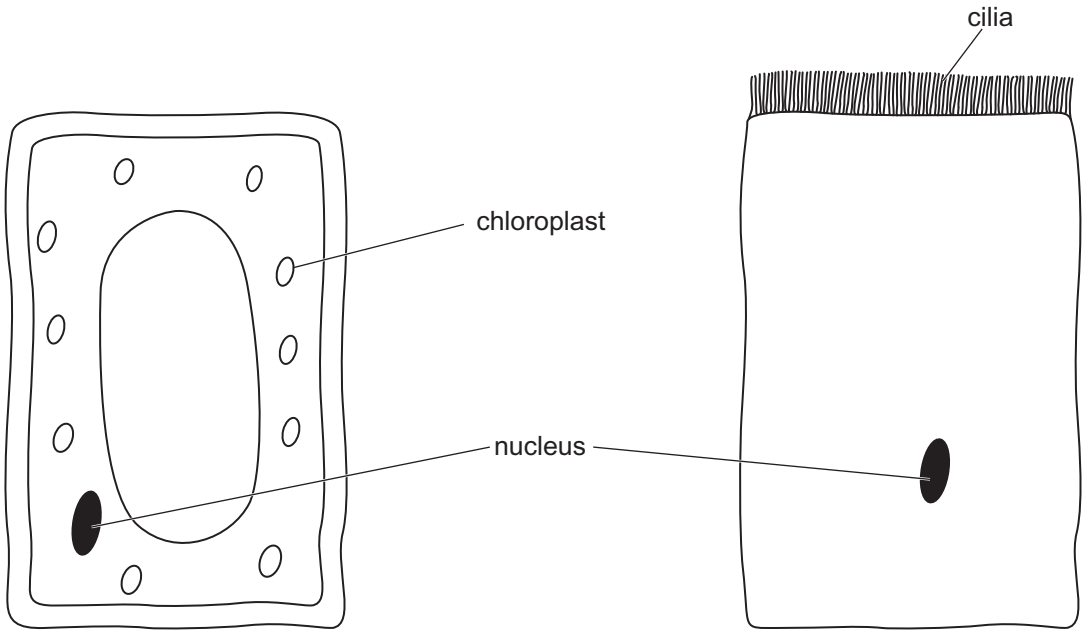
(b) As well as excretion, the kidney has another very important role in homeostasis. Name this other role.

_____ [1]

Examiner Only	
Marks	Remark

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5 The diagram shows two types of cell.



(a) Where would you expect to find cell type A in a plant?

_____ [1]

(b) Give one place where ciliated epithelium (cell type B) is found in animals.

_____ [1]

(c) Name the genetic structures that are present in the nucleus of cells.

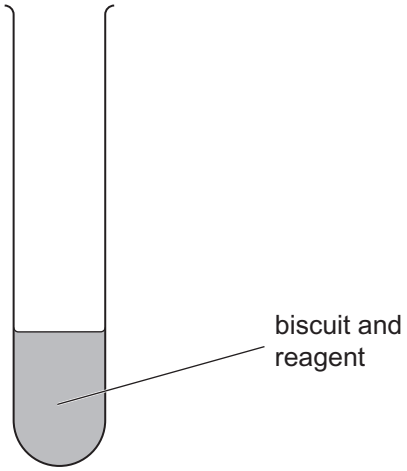
_____ [1]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

6 A student carried out a food test to find out if a biscuit contains sugar. The biscuit was ground up into crumbs and a chemical reagent added.



(a) Name the chemical reagent added to the biscuit to test for the presence of sugar.

_____ [1]

(b) Describe what has to happen after adding the reagent to complete the test.

_____ [1]

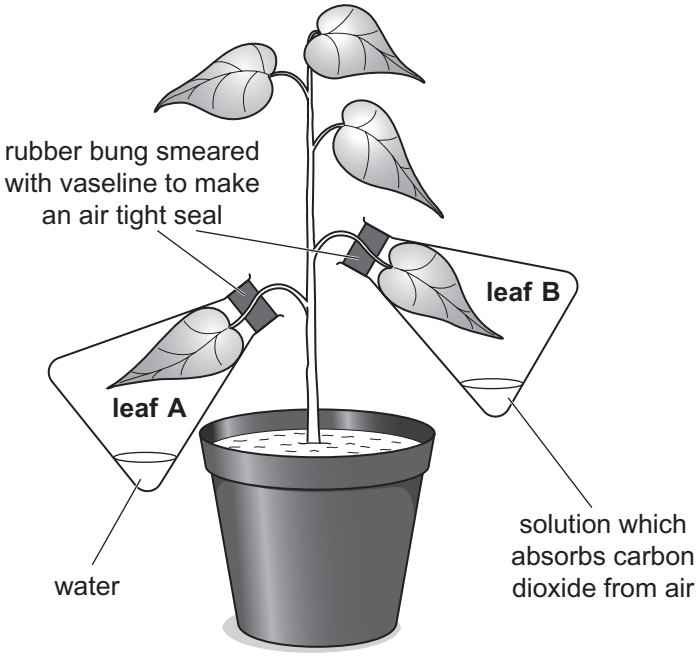
(c) Describe the colour change that occurs if the biscuit contains sugar.

_____ to _____ [1]

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Examiner Only	
Marks	Remark

7 The apparatus below was set up to find out if carbon dioxide is needed for photosynthesis. The plant was destarched and then left in a warm, sunny place for a few days after which leaf A and leaf B were tested for starch with iodine.



(a) Explain the function of **leaf A**.

_____ [1]

(b) After testing with iodine, describe the colour you would expect for each leaf.

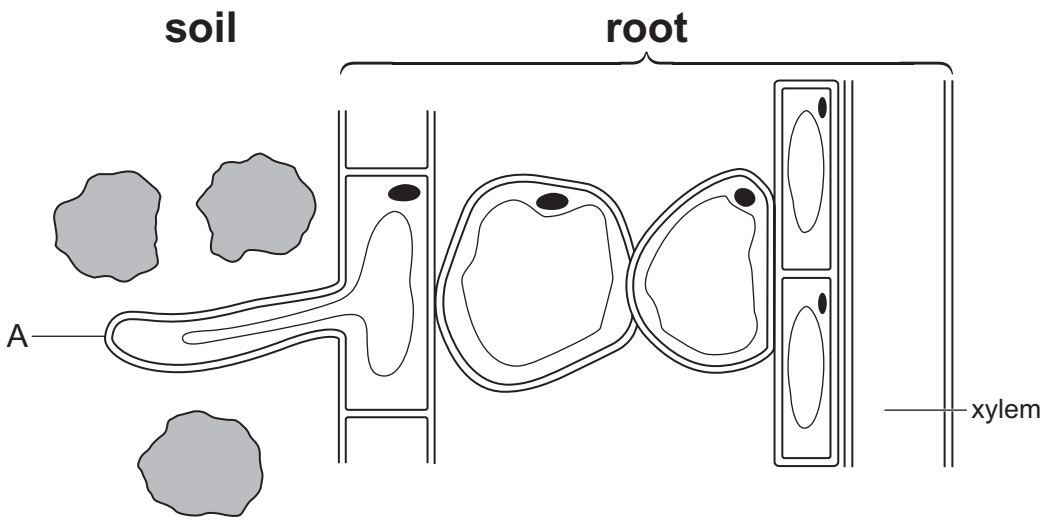
Leaf A _____

Leaf B _____ [2]

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Examiner Only	
Marks	Remark

8 The diagram shows part of a root.



(a) Name cell type A.

_____ [1]

(b) Give the function of xylem.

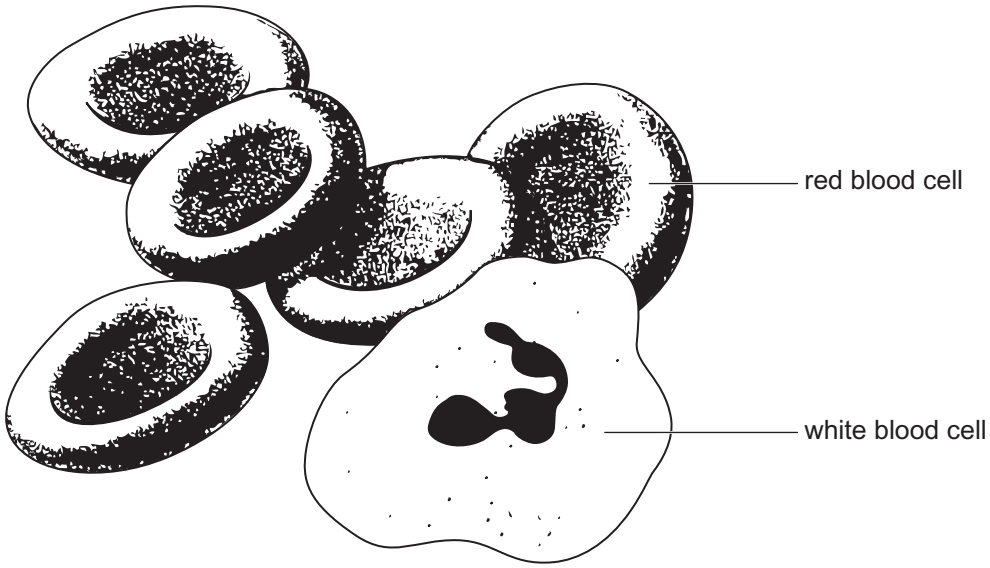
_____ [1]

(c) If there is not enough nitrate in the soil, explain how this will affect the plant.

_____ [1]

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9 The diagram shows two types of blood cell.



(a) Complete the table to give two differences shown in the diagram, between a white blood cell and a red blood cell.

Difference	White blood cell	Red blood cell
1		
2		

[2]

(b) The liquid that transports blood cells carries other substances around the body. Name this liquid and give one substance, apart from blood cells, that it transports.

_____

_____ [2]

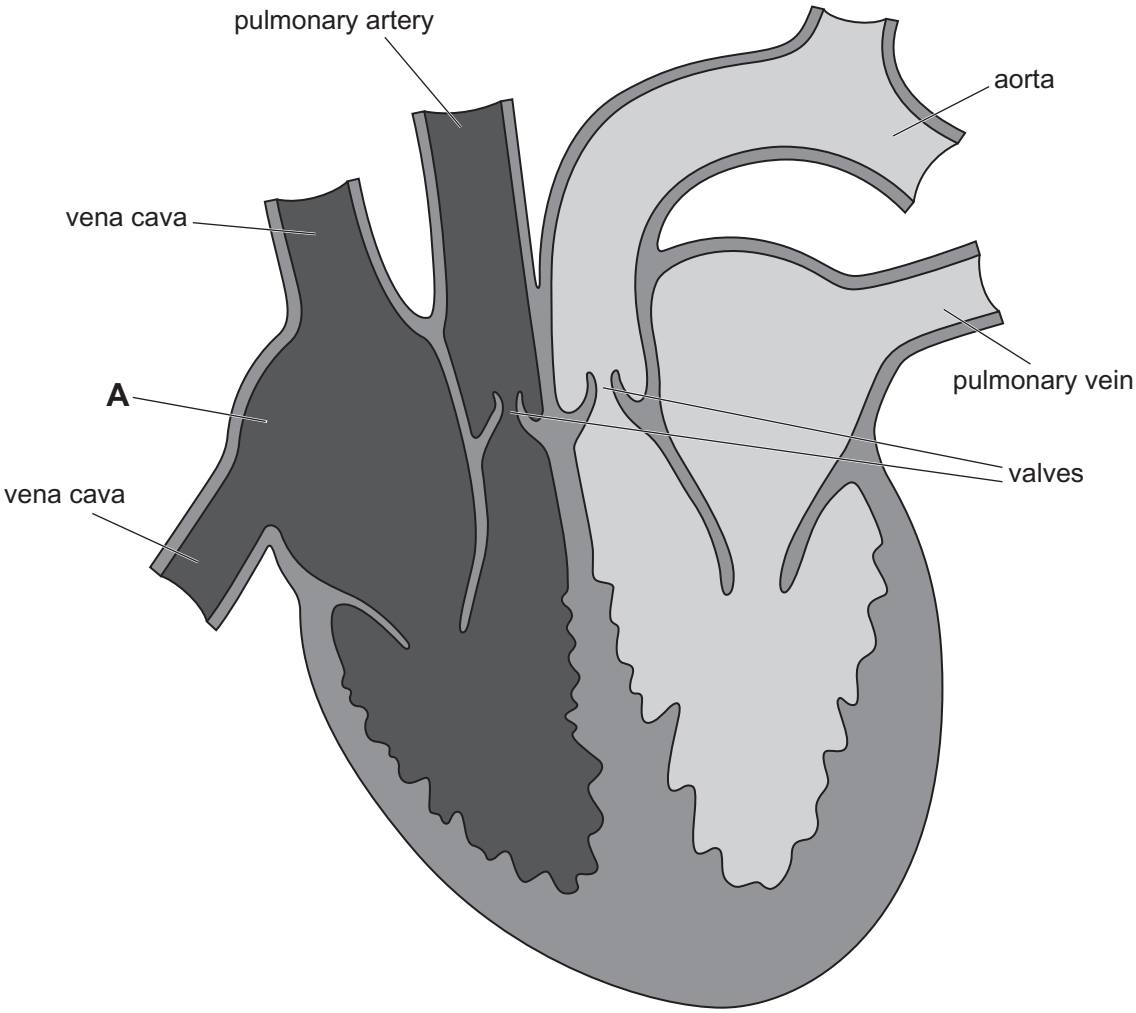
Examiner Only

Marks	Remark

STEMUP.CO.UK

10 The diagram shows a section through the human heart.

Examiner Only	
Marks	Remark



(a) Name the heart chamber labelled **A**.

_____ [1]

(b) Use the diagram to name the two blood vessels that carry oxygenated blood.

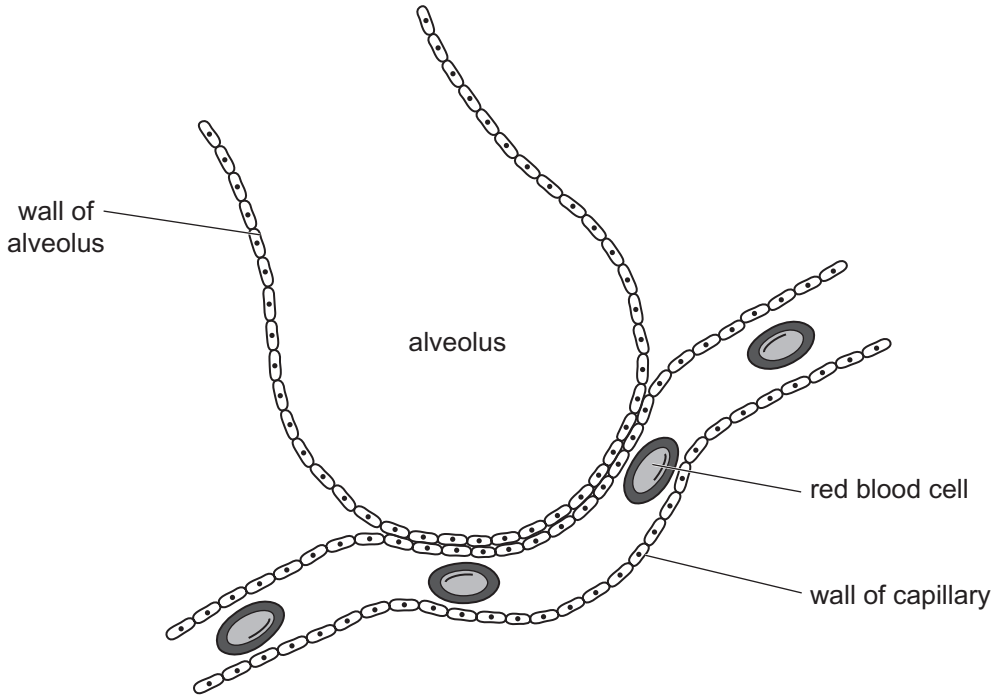
1. _____

2. _____ [2]

(c) Suggest a function for the presence of the valves in the pulmonary artery and the aorta.

_____ [1]

11 The diagram shows an alveolus with its associated capillary.



(a) Use the diagram to state one feature about the wall of the alveolus that helps gas exchange.

_____ [1]

(b) Name the gas that diffuses from the alveolus into the red blood cells.

_____ [1]

(c) Explain how having millions of alveoli in the lung facilitates gas exchange.

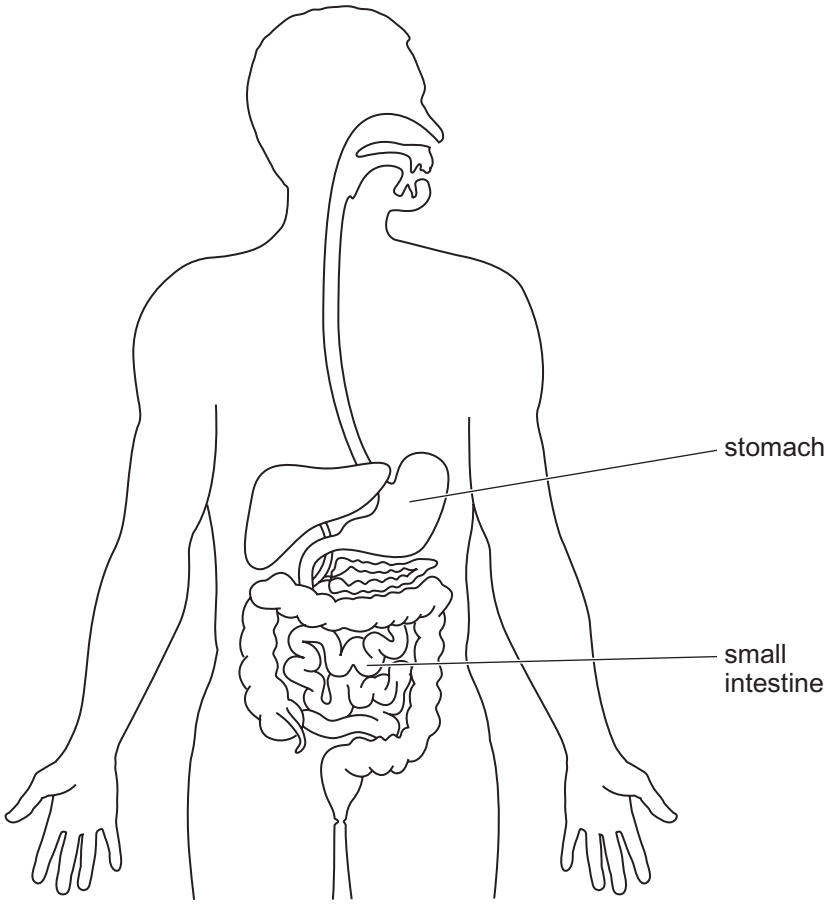
_____ [1]

Examiner Only

Marks	Remark

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12 The diagram shows the digestive system.



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(a) What type of digestive enzyme is present in the stomach?

_____ [1]

(b) Describe one way, **not visible in the diagram**, in which the small intestine is adapted for absorption.

_____ [1]

(c) Name the organ that digested food molecules such as amino acids and glucose are taken to immediately after being absorbed.

_____ [1]

Examiner Only	
Marks	Remark

13 (a) Give an example of a disease caused by a fungus.

_____ [1]

(b) Complete the table below about active and passive immunity.

Type of immunity	Source of antibodies
Active immunity	
Passive immunity	

[2]

(c) Explain why active immunity is described as long-term, whereas passive immunity is only short-term.

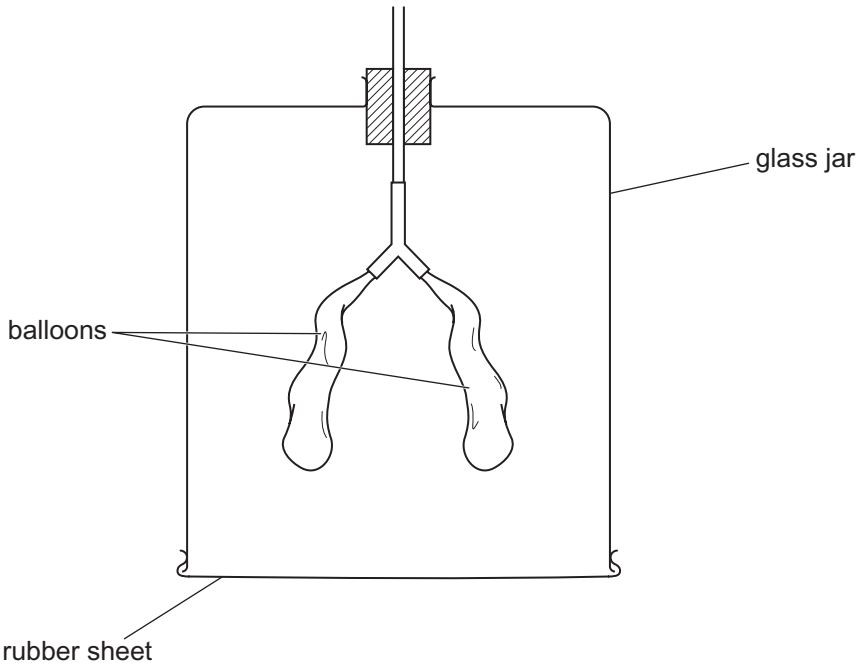
_____ [1]

Examiner Only

Marks	Remark

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14 The diagram shows apparatus that can be used to demonstrate breathing in a human.



(a) What structure does the rubber sheet represent?

_____ [1]

(b) Explain why the balloons inflate when the rubber sheet is pulled down.

_____

_____ [2]

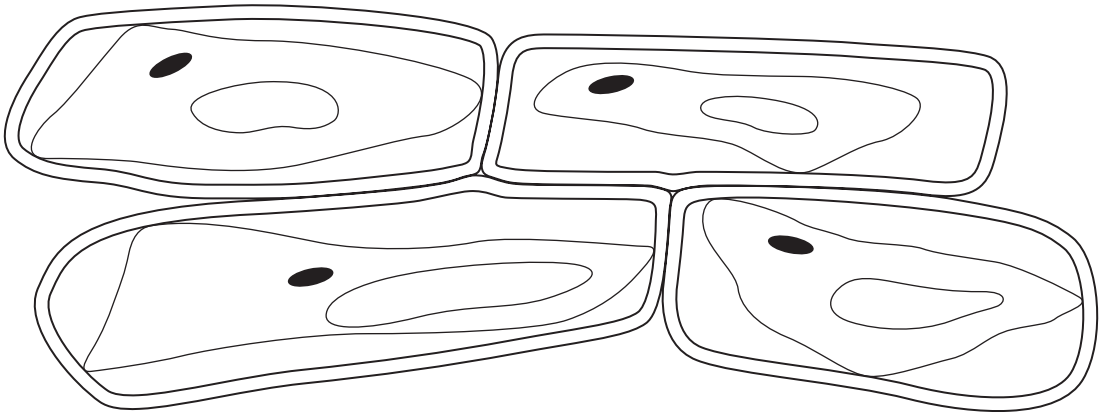
(c) Describe one way in which the balloons, shown in the diagram, do not accurately represent the structure of the lungs.

_____ [1]

Examiner Only	
Marks	Remark

15 Jenny placed onion epidermis cells in a 10% sugar solution and examined a section of them using a microscope.

Some of the cells are shown below.



Describe and explain the appearance of these cells.

[4]

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Marks	Remark

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111970

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General Certificate of Secondary Education
2011–2012

Science: Double Award (Modular)

Living Organisms and the Processes of Life

End of Module Test
Foundation Tier

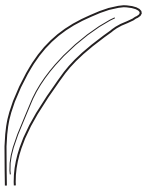
A

[GDA01]

TUESDAY 8 NOVEMBER 2011
1.30 pm–2.15 pm

MARK SCHEME

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				AVAILABLE MARKS
1	**(a)**	Damages the liver; damages brain/kidney/addictive	[2]	
	(b)	Produces false impressions in mind/illusions/apparent perception of an external object that is not actually present/imaging things not there	[1]	
		(***not*** *mental confusion* ***not*** *memory loss*)		3
2	**(a)**	A = pupil B = optic nerve	[2]	
	(b)	To focus the light rays/refract/bend light not reflect	[1]	3
3	**(a)**	 bend to right	[1]	
	(b)	Phototropism	[1]	
	(c)	Auxin/plant hormone	[1]	3
4	**(a)**	A = ureter B = urethra	[2]	
	(b)	Osmoregulation/control of water level in body/water/salt balance	[1]	3
5	**(a)**	Leaf/palisade layer/spongy layer/mesophyll layer	[1]	
	(b)	Respiratory tract/oviduct/fallopian tube/nose/throat/bronchi/ bronchioles/trachea	[1]	
	(c)	Chromosomes (*not genes/not DNA*)	[1]	3
6	**(a)**	Benedicts (reagent)	[1]	
	(b)	Heat/put in water bath/or description	[1]	
	(c)	Blue → orange/red/red precipitate/brick red	[1]	3
7	**(a)**	act as control/show comparison	[1]	
	(b)	A. Blue – black or blue or black – (***not*** *purple*) B. Yellow/orange/brown – (***not*** *red*)	[2]	3

				AVAILABLE MARKS
8	**(a)**	Root hair cell	[1]	
	(b)	Transport of water/mineral salts or named salt	[1]	
	(c)	No amino acid/protein synthesis/yellow leaves (**not** *growth on its own*)	[1]	3

9 Any **two** from diagram:

(a)

White blood cell	Red blood cell
(lobed) nucleus present	no nucleus
larger	smaller
irregular shaped	disk shaped
less numerous	more numerous

[2]

(b) Plasma;
glucose/amino acids/urea/hormone/named hormone/vitamins/minerals/salts/antibodies/heat/carbon dioxide
(**not** *oxygen/not food*) [2] — 4

10	**(a)**	A – right atrium	[1]	
	(b)	Aorta; pulmonary vein	[2]	
	(c)	Prevents back flow of blood into the heart/stop blood going in wrong direction/stop blood flowing back into ventricles	[1]	4
11	**(a)**	One cell thick/thin flattened cells/large surface/short diffusion distance close to blood – (**not** *moist not permeable*)	[1]	
	(b)	Oxygen/O_2	[1]	
	(c)	Increases surface area/more diffusion occurs/speeds up diffusion	[1]	3
12	**(a)**	Protease/pepsin	[1]	
	(b)	Villi/microvilli/good blood supply/permeable/thin walls (***not*** *long not large surface area not folds on its own*)	[1]	
	(c)	Liver	[1]	3

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			AVAILABLE MARKS
13	**(a)** Athletes foot/ringworm/thrush	[1]	
	(b)		

Active	Produced by body itself
Passive	From outside the body e.g. colostrum/pass across placenta

vaccination/injection

[2]

(c) Active-memory cells made/antibodies remain in the blood (***not*** *memory on its own*) [1] — 4

14 **(a)** Diaphragm [1]

(b) Increased volume; decrease in pressure
more space in jar [2]

(c) Do not have alveoli/no associated blood capillaries/lots of air sacs
No branching/no cells present/no bronchioles [1] — 4

15 **Description:** Cells are plasmolysed/flaccid/cell membrane has pulled away from the cell wall; (***not*** *turgid* ***not*** *smaller vacuole*)
Explanation: Lower water concentration outside the cells (than in the sugar solution); or more conc. sugar solution outside
so water moves out of cells;
by osmosis;
across a partially permeable membrane/semi-permeable.
Marking – 1 for Description
– Any **three** for Explanation
down conc. gradient but only if water moving out } 2 marks
*(**not** down conc. gradient on its own)* — 4

Total — **50**

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Rewarding Learning

Centre Number

71	

Candidate Number

General Certificate of Secondary Education
2010–2011

Science: Double Award (Modular)

Living Organisms and the Processes of Life
End of Module Test

Foundation Tier

A

[GDA01]

GDA01

THURSDAY 19 MAY 2011, MORNING

TIME

45 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all thirteen** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 50.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
Total Marks	

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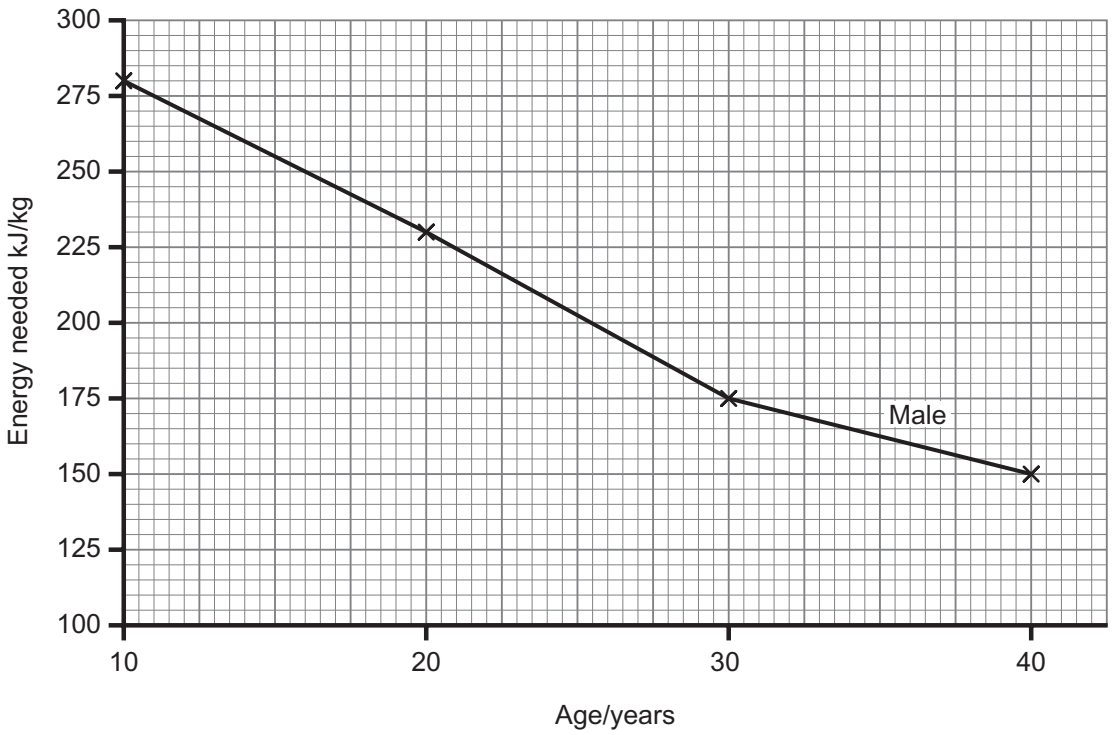
Examiner Only	
Marks	Remark

1 The table below gives the average daily energy needed by males and females of different ages.

Male		Female	
Age/ years	**Energy needed kJ/kg**	**Age/ years**	**Energy needed kJ/kg**
10	280	10	220
20	230	20	200
30	175	30	150
40	150	40	130

(a) The figures for males have been plotted on the graph below.

Plot the figures for females. Join each point with a straight line.



[2]

(b) Use your graph to give the energy needed by a 15-year-old female.

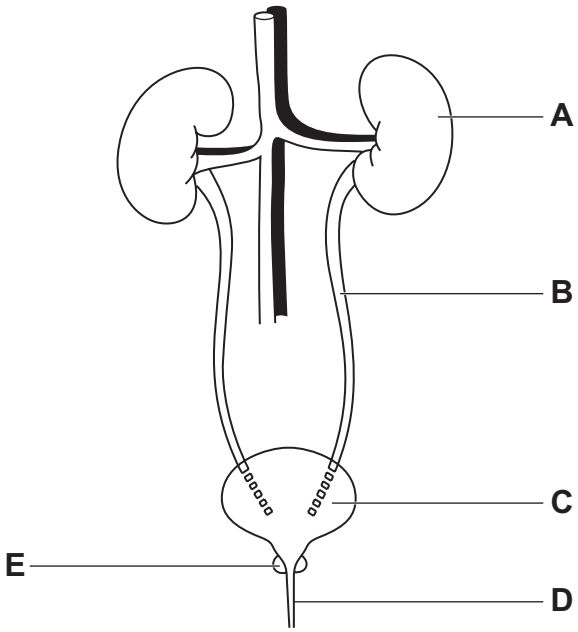
_____ kJ/kg [1]

(c) Suggest why the energy requirements of a 10-year-old male are higher than those of a 40-year-old male.

_____ [1]

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2 The human excretory system is shown in the diagram.



(a) Which part, **A**, **B**, **C** or **D**, is the ureter?

_____ [1]

(b) Name structure **E** that controls the release of urine from the bladder.

_____ [1]

(c) The kidney controls the level of water in the body. What name is used to describe the control of water balance?

_____ [1]

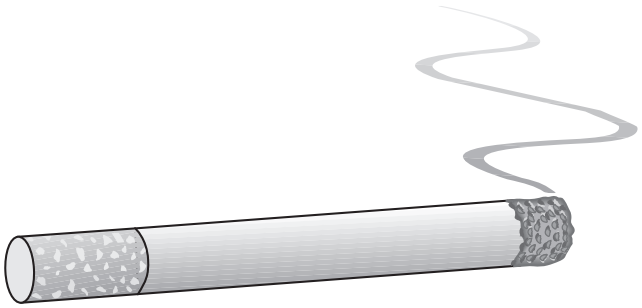
Examiner Only

Marks	Remark

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Examiner Only	
Marks	Remark

3 Smoking cigarettes affects the health of an individual.



(a) Complete the table about the chemicals in cigarettes and how they affect health.

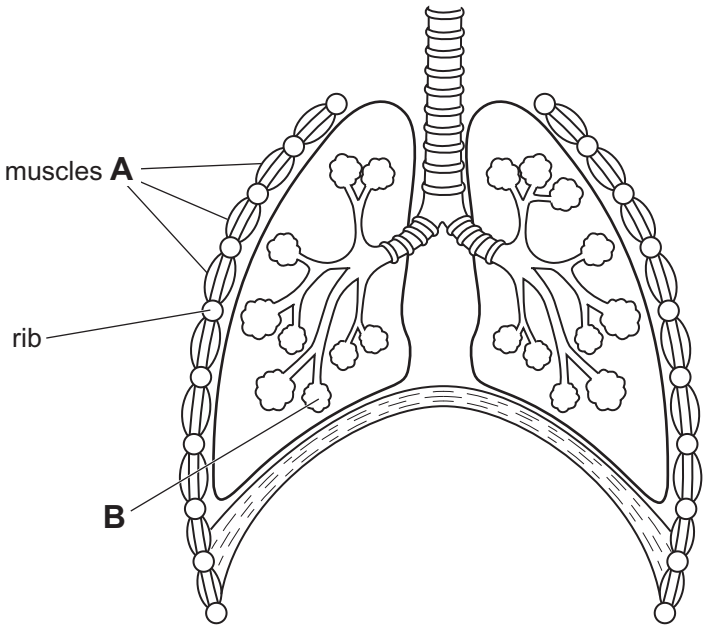
Chemical	Effect on the body
Tar	
Nicotine	
	Displaces oxygen in the red blood cells

[3]

(b) Explain what is meant by passive smoking.

_____ [1]

4 The human respiratory system is shown in the diagram.



(a) Name the muscles **A** shown in the diagram.

_____ [1]

(b) **(i)** Structure **B** is an alveolus.
What structures, not shown in the diagram, surround the alveoli?

_____ [1]

(ii) State **one** other way (apart from the presence of these structures in **(i)**) that alveoli are adapted for efficient gas exchange.

_____ [1]

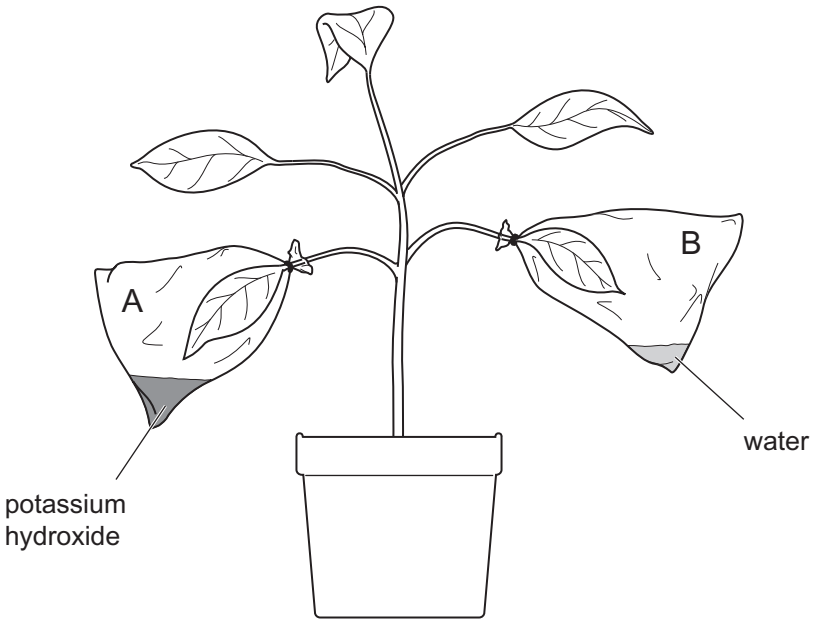
Examiner Only

Marks	Remark

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Examiner Only	
Marks	Remark

5 The diagram shows a plant used in a photosynthesis experiment.



(a) Describe how all the starch in the plant leaves could be removed before the start of the experiment.

_____ [1]

(b) Name the gas used in photosynthesis that is absorbed by the potassium hydroxide.

_____ [1]

(c) After the plant was left in the light for 24 hours, leaves A and B were tested for starch.

(i) What substance is used to test for starch?

_____ [1]

(ii) Complete the table below to give the colour of leaf A and leaf B at the end of the experiment, after they have been tested for starch.

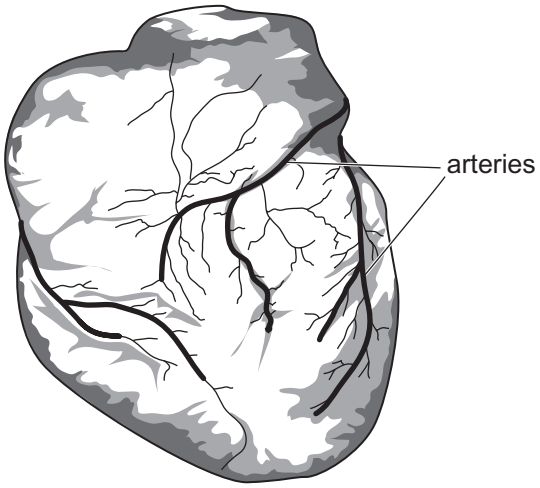
	Colour after starch test
Leaf A	
Leaf B	

[2]

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Examiner Only	
Marks	Remark

6 The photograph shows the arteries, on the surface of the heart, that carry blood to the heart muscle.



(a) Name these arteries.

_____ [1]

(b) Name the two raw materials for respiration in the heart muscle cells that are carried by these arteries.

1. _____

2. _____ [2]

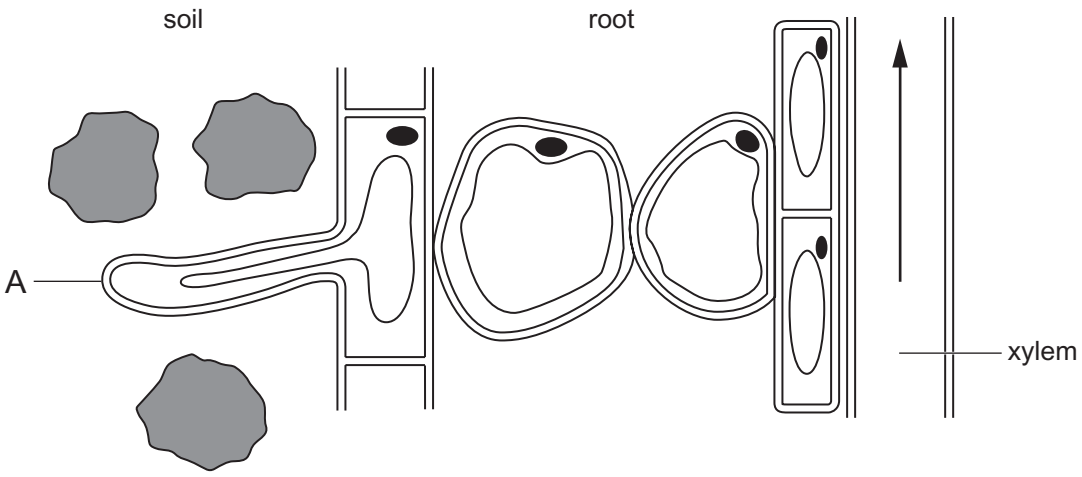
(c) If these arteries become blocked, this can lead to a heart attack. Suggest two lifestyle changes that can reduce the risk of having a heart attack.

1. _____

2. _____ [2]

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7 The diagram shows part of a root of a plant.



(a) Name cell type A.

_____ [1]

(b) Explain how the extension of cell A helps it to carry out its function.

_____

_____ [2]

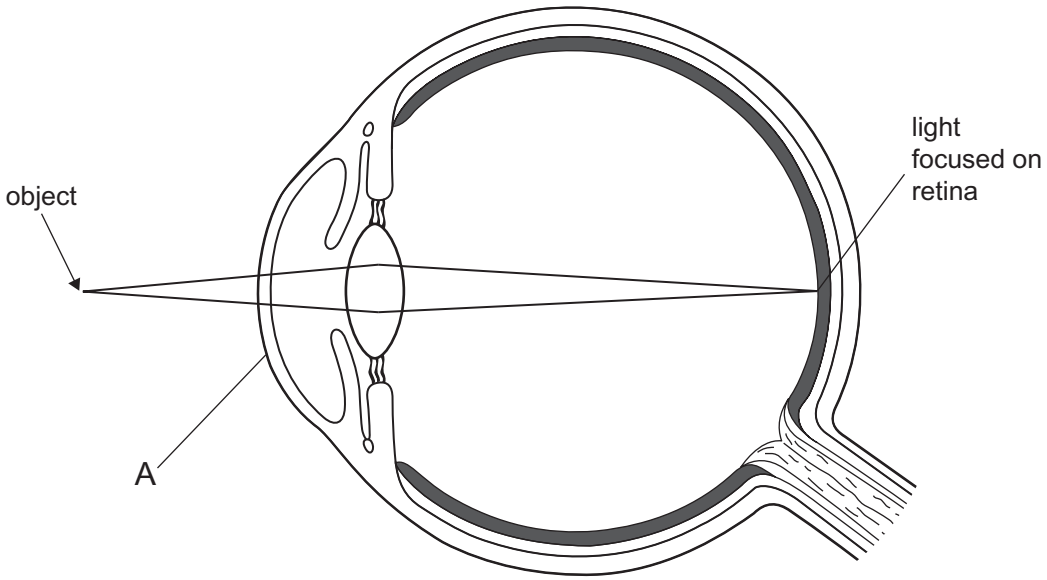
(c) Suggest why the cells in the diagram do not have chloroplasts.

_____ [1]

Examiner Only	
Marks	Remark

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8 The diagram shows light from an object being focused by a human eye.



(a) Name part A.

_____ [1]

(b) Describe how the image is focused on the retina and relayed to the brain.

_____

_____

_____

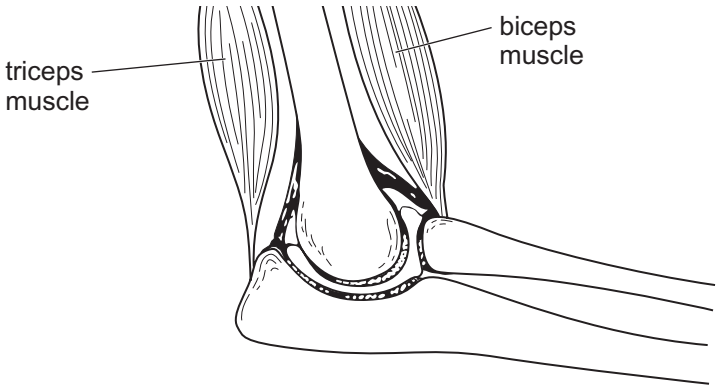
_____ [3]

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Marks	Remark

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9 The diagram shows a section through the elbow joint.



(a) Use the diagram to explain what will happen to the two muscles when the lower arm is raised.

_____

_____ [2]

(b) Explain why the biceps and triceps are described as being an antagonistic pair of muscles.

_____ [1]

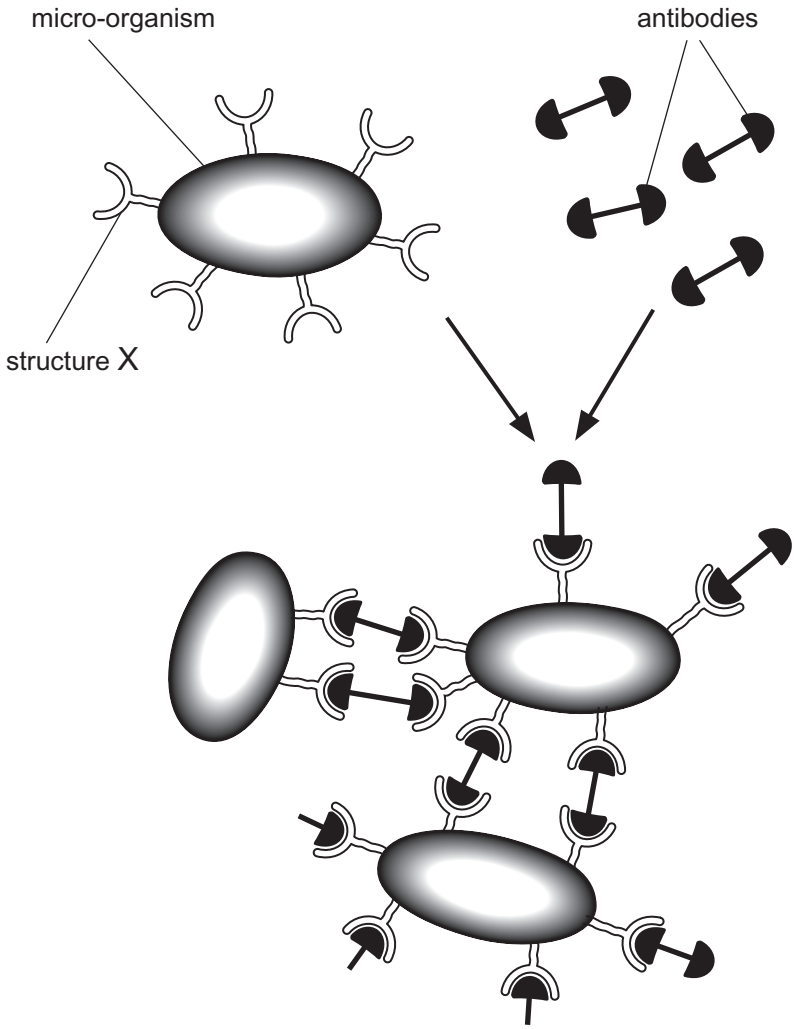
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Marks	Remark

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Examiner Only	
Marks	Remark

10 One way that the body deals with invading micro-organisms is to produce antibodies. The diagram shows the sequence of events following the production of antibodies.



(a) Name structure X on the micro-organism that causes the production of antibodies.

_____ [1]

(b) Explain what will happen to the clump shown in the diagram.

_____

_____

_____ [2]

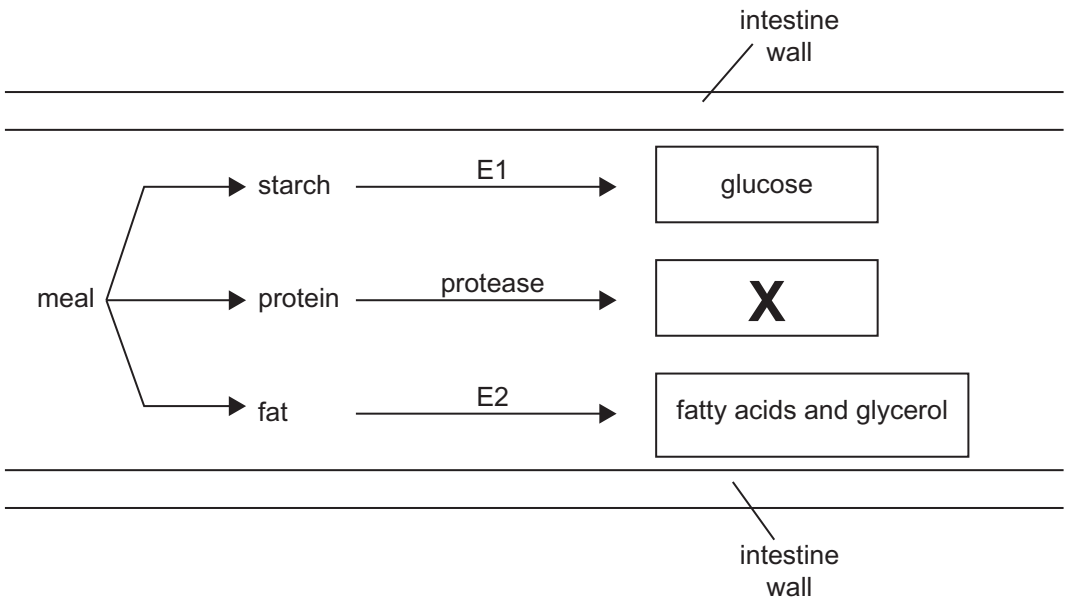
(c) Suggest why a person is unlikely to get the same disease twice, once antibodies have been produced.

_____ [1]

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Examiner Only	
Marks	Remark

11 The diagram shows some of the processes going on in the small intestine after a meal has been eaten.



(a) Use the diagram to name the enzymes, E1 and E2.

E1 _____

E2 _____ [2]

(b) Name substance X.

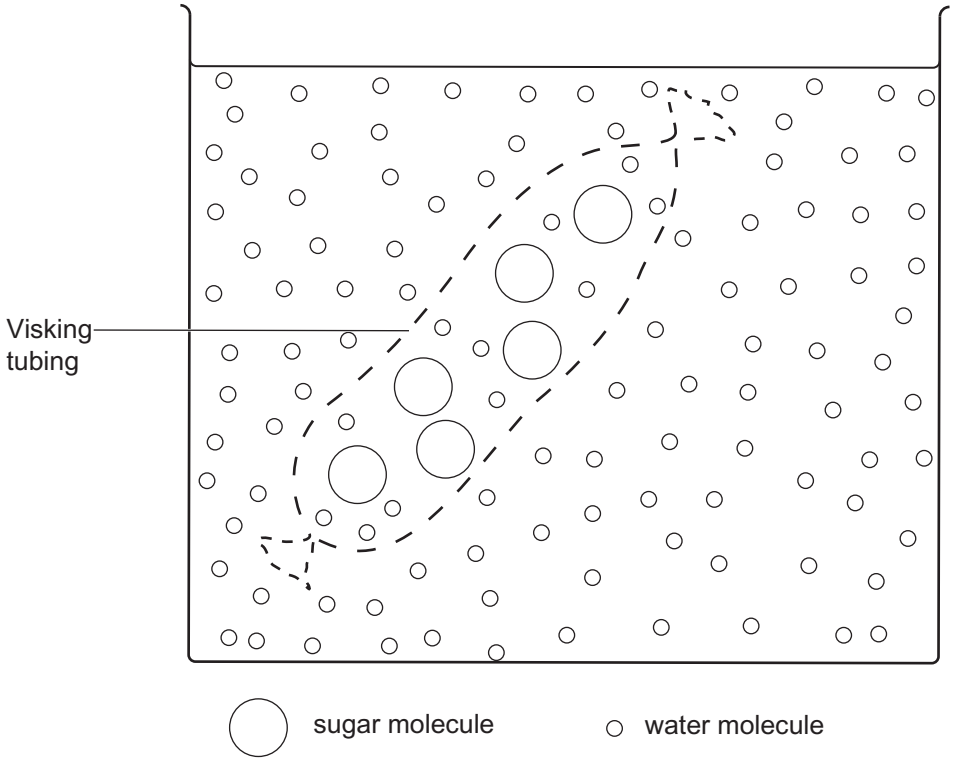
_____ [1]

(c) Give **one** way (not shown on the diagram) that the intestine wall is adapted for absorption.

_____ [1]

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12 Visking tubing was filled with sugar solution and then placed in a beaker of water.



The Visking tubing is partially permeable.

Use the information in the diagram to describe and explain what would happen if the Visking tubing was left in the water for 24 hours.

_____

_____

_____

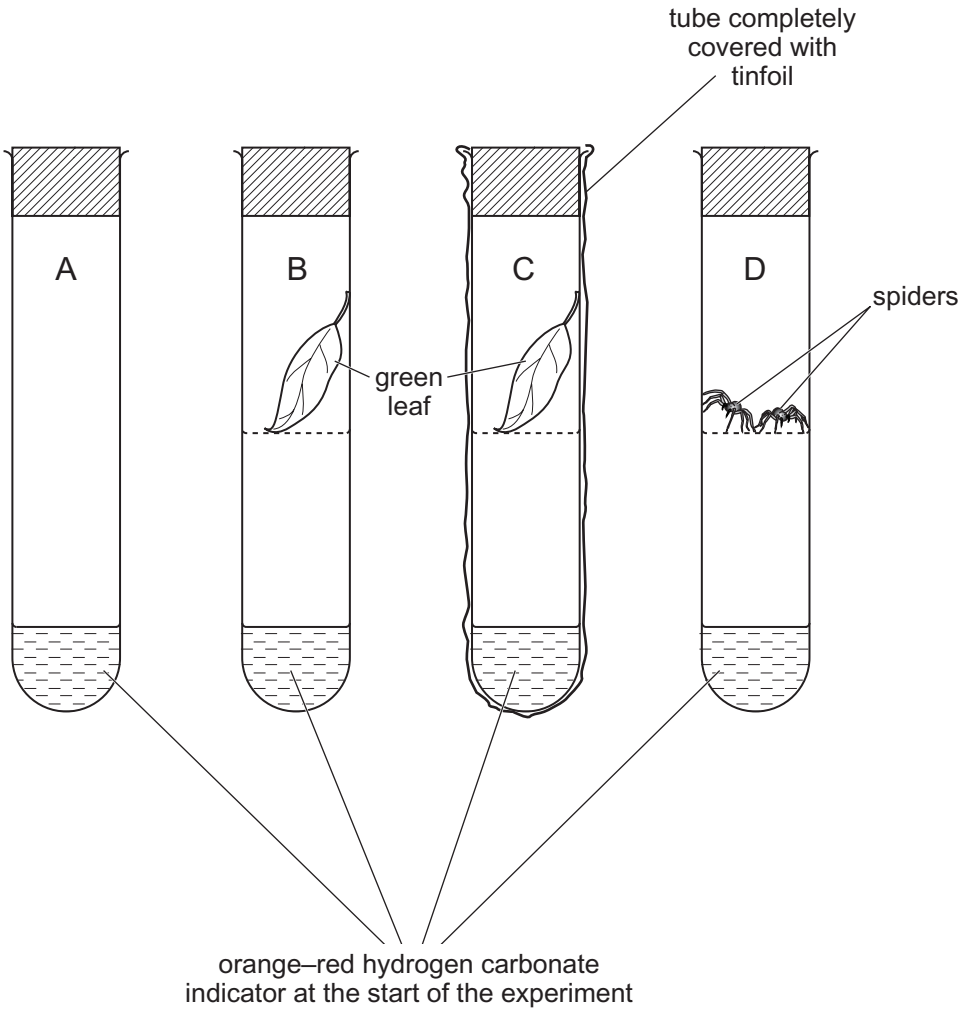
_____

_____ [3]

Examiner Only

Marks	Remark

13 This experiment was set up to investigate gas exchange.



The colour changes of hydrogen carbonate indicator are shown below.

Purple ← Less carbon dioxide — Orange–red — More carbon dioxide → Yellow

Examiner Only

Marks	Remark

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The tubes were left in bright light for 10 hours.

Complete the table below to state and explain the results of this experiment.

Tube	Colour of hydrogen carbonate indicator	Explanation of results
A	Orange–red	No living organisms present. No photosynthesis. No respiration.
B		Leaf in light. Uses more carbon dioxide in photosynthesis than it produces in respiration.
C		
D	Yellow	

[4]

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Marks	Remark

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Living Organisms and the Processes of Life
End of Module Test

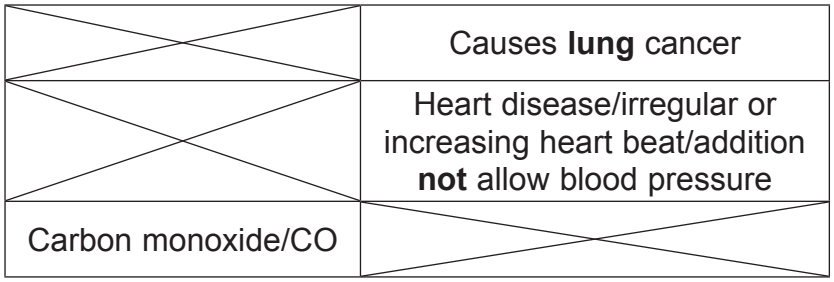
Foundation Tier

[GDA01]

THURSDAY 19 MAY 2011, MORNING

MARK SCHEME

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			AVAILABLE MARKS
1	**(a)**	points correctly plotted; straight lines joining points of bars = [1] [2]	
	(b)	210 – CM from their line [1]	
	(c)	growing more/more active [1]	4
2	**(a)**	B [1]	
	(b)	Sphincter muscle/sphincter **not** muscle on its own [1]	
	(c)	Osmoregulation [1]	3
3	**(a)**	 [3]	
	(b)	Breathing in other peoples' smoke/**not** allow carbon dioxide/2nd hand smoke [1]	4
4	**(a)**	Intercostal (muscle)/intercostal [1]	
	(b)	**(i)** Blood capillaries/capillaries **not** blood vessels [1]	
		(ii) Large surface area/moist/thin/permeable/one cell thick **not** allow – there are lots of them **not** expand and contract [1]	3
5	**(a)**	place in a dark cupboard for 24 hours/overnight **not** keep away from light [1]	
	(b)	Carbon dioxide/CO_2 [1]	
	(c)	**(i)** Iodine solution [1]	
		(ii)	

Leaf A	Yellow/brown/orange
Leaf B	Blue/black

[2] 5

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				AVAILABLE MARKS
6	**(a)**	Coronary (arteries)	[1]	
	(b)	Glucose; } either order Oxygen }	[2]	
	(c)	Any **two** from: Less (animal) fat in diet; less salt in diet; balanced diet; Less alcohol; Reduce stress; *More* exercise; Stop smoking.	[2]	5
7	**(a)**	Root hair cell	[1]	
	(b)	Any **two** from: Increased surface area; for absorption; of minerals/water/or named mineral/**not** nutrients	[2]	
	(c)	Cells are in the soil so cannot absorb light/below ground cells do not photosynthesis	[1]	4
8	**(a)**	Cornea **not** conjunctiva	[1]	
	(b)	Light is bent/refracted; by the cornea/lens; Information passes along *optic* nerve (to brain)	[3]	4
9	**(a)**	Biceps contracts/shortens;/tenses/tightens Triceps relaxes/extends/gets longer	[2]	
	(b)	Muscles work against each other/when one contracts, the other relaxes Tense one/other relaxed	[1]	3
10	**(a)**	Antigens/proteins	[1]	
	(b)	Clump is ingested/engulf/consumed/digested by phagocytes/by white blood cells	[2]	
	(c)	Antibodies remain in the blood/memory cells made WBC retain memory/more antibodies produced quickly	[1]	4

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		AVAILABLE MARKS
11	**(a)** E1 – Amylase E2 – Lipase [2]	
	(b) Amino acids [1]	
	(c) Large surface area/villi/microvilli/thin/long **not** cilia [1]	4
12	Visking tubing bigger/bag bigger/swells/swollen/turgid/expands [1]	
	Any **two** from four: water molecules pass through but not sugar molecules/sugar molecules too big to pass through/or H_2O small enough to pass through water moves into the tubing; by osmosis; (down the concentration (must be clear where gradient in) gradient/higher water concentration outside the Visking tubing/concentration H_2O more outside than inside max. [2] if they have made incorrect statement ([1] for correct description, [1] for rest) [2]	3
13		

A		
B	Purple	
C	Yellow	Leaf *respires*
D		Spiders *respire*/respiration

[4] 4

Total **50**

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Rewarding Learning

Centre Number

71	

Candidate Number

General Certificate of Secondary Education
2010–2011

Science: Double Award (Modular)

Living Organisms and the Processes of Life

End of Module Test

Foundation Tier

A

[GDA01]

GDA01

THURSDAY 24 FEBRUARY 2011, MORNING

TIME

45 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all twelve** questions.

INFORMATION FOR CANDIDATES

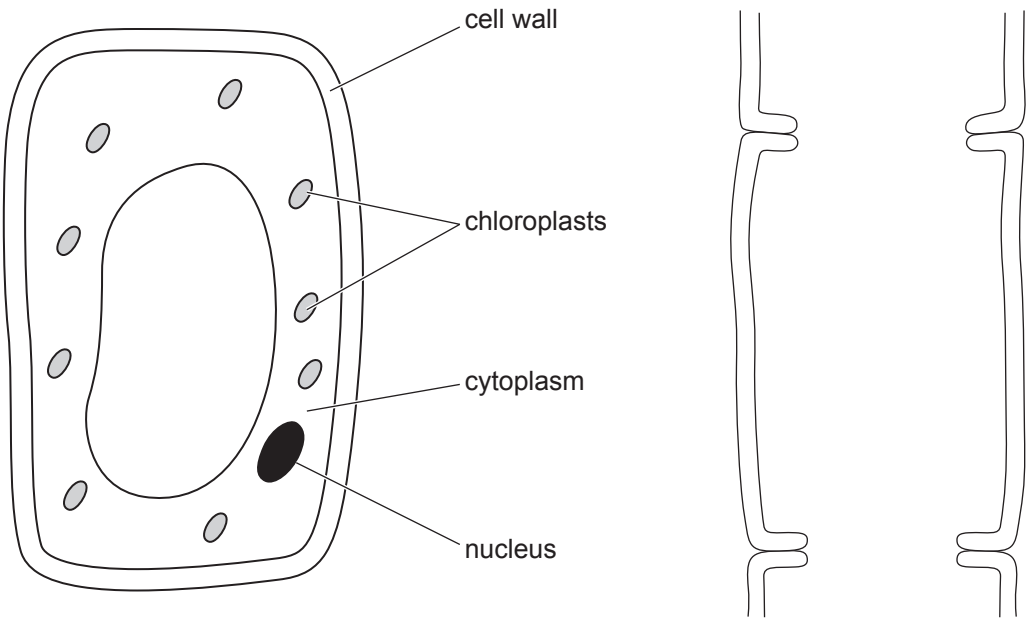
The total mark for this paper is 50.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
Total Marks	

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Examiner Only	
Marks	Remark

1 The diagrams show two plant cells.



palisade cell **xylem cell**

(a) Name the mineral needed for cell wall formation.

_____ [1]

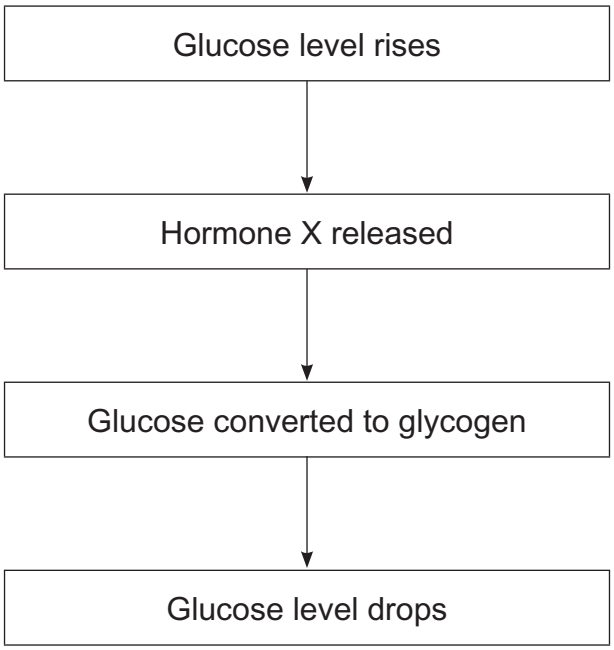
(b) Suggest why the xylem cell has no internal structures, e.g. no nucleus or cytoplasm.

_____ [1]

(c) In which part of the plant are palisade cells found?

_____ [1]

2 The flowchart shows how the level of glucose is controlled in the blood.



(a) Suggest what causes a rise in blood glucose levels.

_____ [1]

(b) Name hormone X.

_____ [1]

(c) Name the condition where the body does not produce enough of this hormone.

_____ [1]

(d) If a person does not produce enough hormone X then the person is treated with injections of this hormone (a protein).

Suggest why this hormone cannot be taken in tablet form.

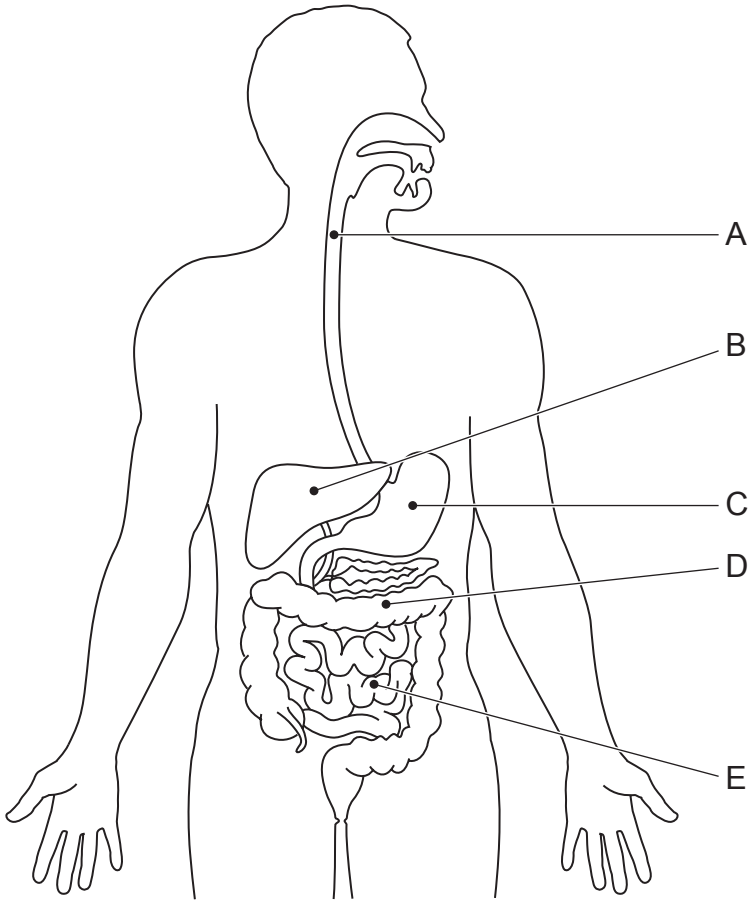
_____ [1]

Examiner Only

Marks	Remark

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3 The diagram shows the digestive system.



(a) Explain why it is important that food is digested.

_____

_____ [2]

(b) Using letters from the diagram give the regions where protein digestion occurs.

_____ and _____ [2]

(c) What is the function of region D?

_____ [1]

Examiner Only

Marks	Remark

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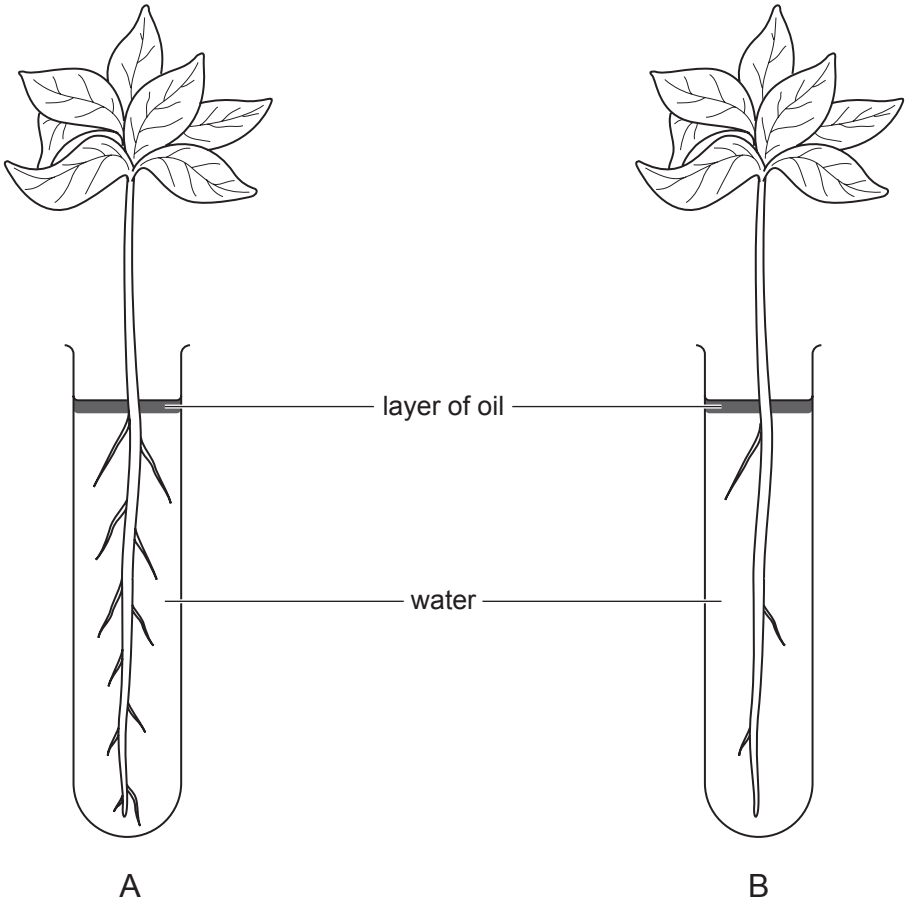
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(Questions continue overleaf)

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Examiner Only	
Marks	Remark

4 The diagram shows an experiment to investigate the loss of water from seedlings A and B.



The seedlings were placed in a bright room. The mass of each test tube was recorded at the beginning of the experiment and after 24 hours.

(a) Name the process where water is lost from the seedling leaves.

_____ [1]

(b) The results of the experiment are shown in the table.

Seedling	A	B
Mass at start/g	200	200
Mass after 24 hrs/g	152	176
Loss in mass after 24 hrs/g		
Rate of water loss g/hr		

Complete the table to show the loss in mass after 24 hours and the rate of water loss for A and B. [2]

(c) Describe and explain the results for the two seedlings.

Examiner Only

Marks	Remark

_____

_____ [2]

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5 A student examined the percentage of gases in inhaled and exhaled air. The results are shown below.

Gas sample	Percentage oxygen	Percentage carbon dioxide	Percentage nitrogen
A	16.1	4	79
B	20.5	0.04	79

(a) Use the information in the table to explain how you know sample A is exhaled air.

_____ [1]

(b) Suggest why the total percentage of the gas samples is slightly less than 100%.

_____ [1]

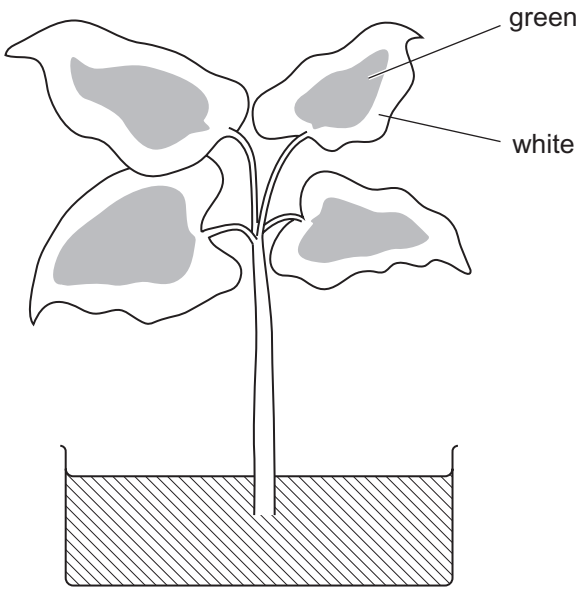
(c) Name the type of respiration that does **not** use oxygen.

_____ [1]

Examiner Only

Marks	Remark

6 You are provided with a variegated plant (part of each leaf is green, the rest is white).



Using the plant and any other apparatus that is required, describe an experiment to show that chlorophyll is needed for photosynthesis.

_____

_____

_____

_____

_____

_____

_____

_____ [4]

Examiner Only

Marks	Remark

7 Excretion is the removal of waste products from the body.

(a) Name **one** waste product of respiration.

_____ [1]

(b) Explain how the waste from respiration is removed from the body.

_____

_____

_____ [2]

Examiner Only	
Marks	Remark

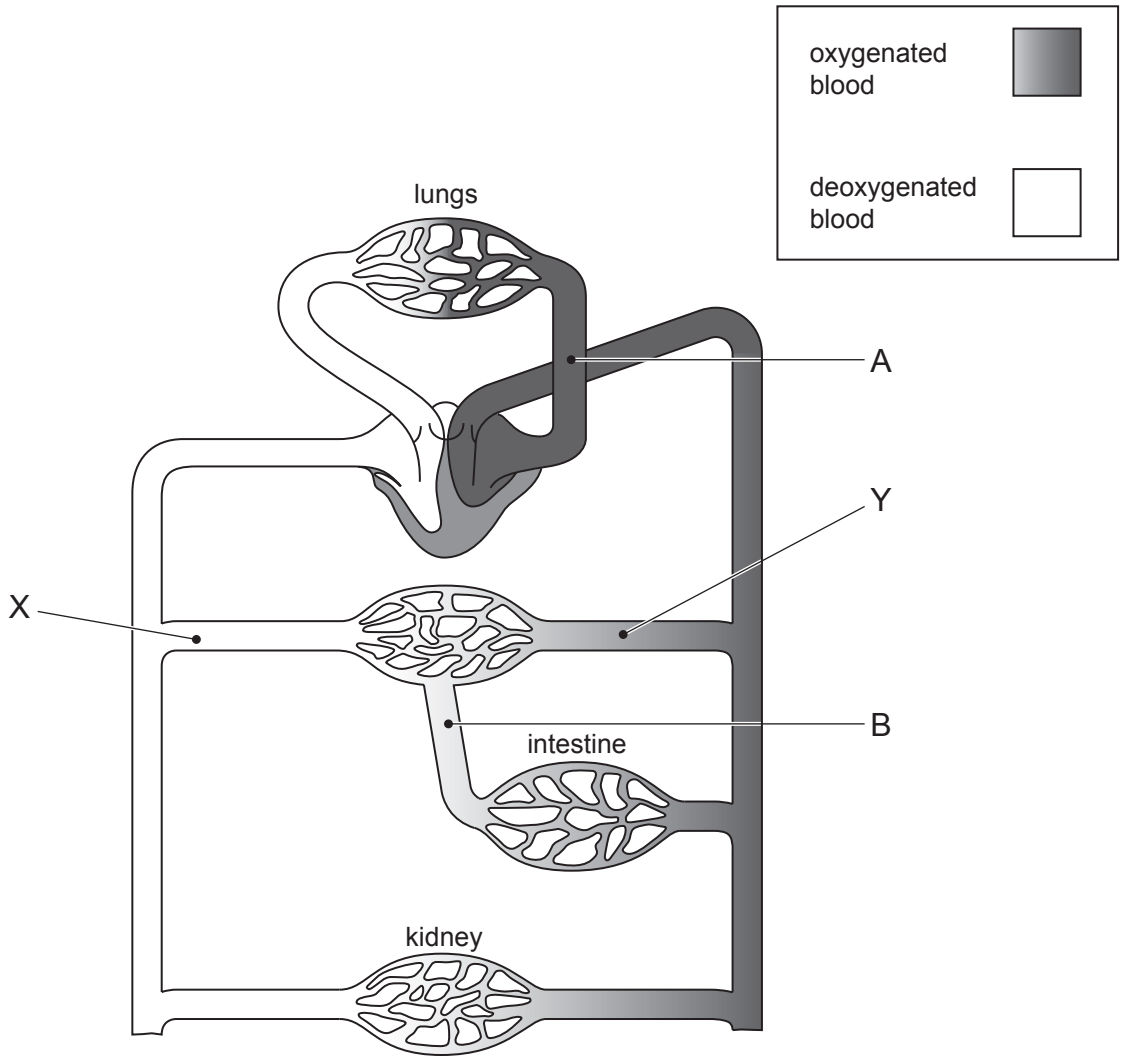
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8 The diagram shows part of the circulatory system.



© Human Biology: An Active Approach by P Rowlinson and M Jenkins, published by Cambridge University Press, 1982

(a) What is meant by **double circulation**?

_____

_____ [1]

(b) Name the blood vessels:

A _____

B _____ [2]

Examiner Only

Marks	Remark

(c) Explain why the concentration of oxygen is lower in vessel X than in vessel Y.

Examiner Only

Marks	Remark

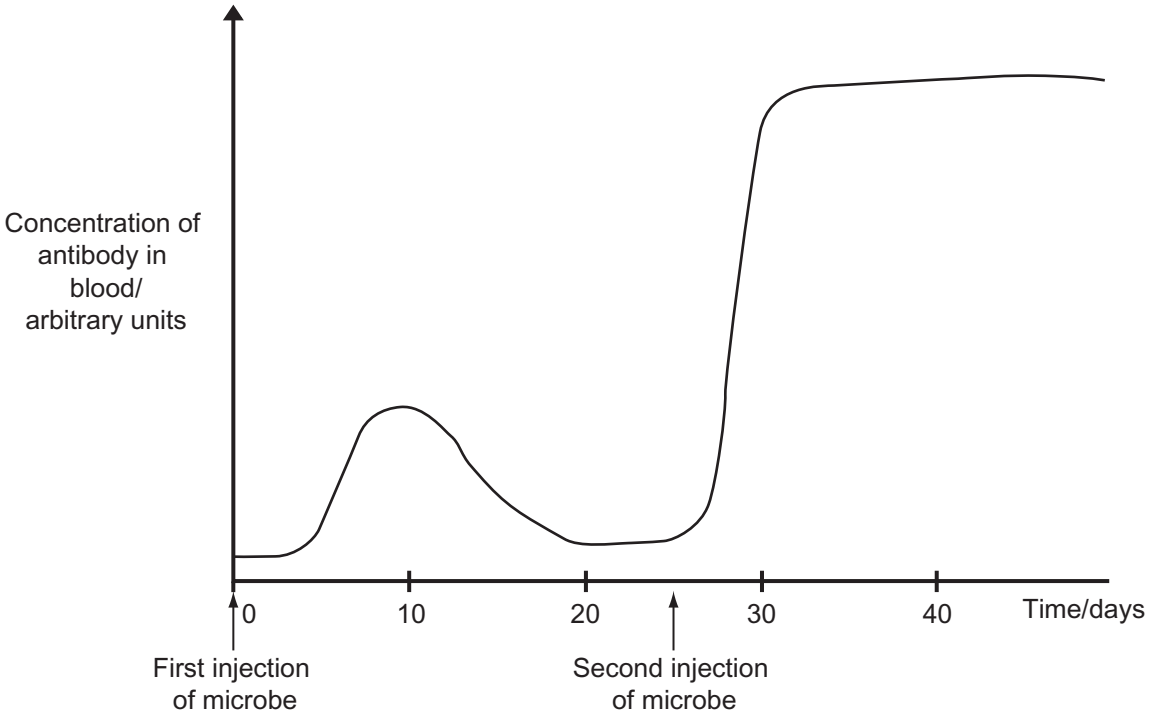
_____

_____ [2]

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Examiner Only	
Marks	Remark

9 The graph shows the body's response to the injection of a microbe.



(a) Name the method of fighting disease where a weakened form of the microbe is injected into the body.

_____ [1]

(b) Use the graph to give two differences between the responses to the first and second injections.

1. _____

2. _____ [2]

(c) The antibodies connect with the microbes to form a clump. Name the process by which the body destroys the clump.

_____ [1]

10 In blood donation, blood is taken from a vein in a person's arm and used to treat patients who need a blood transfusion.



© US Federal Government

The photograph shows a needle inserted into a blood vessel in a donor's arm.

(a) Suggest why the needle is inserted into a vein rather than an artery.

_____ [1]

(b) Use your knowledge of osmosis to explain why the blood cells could be damaged if water was added to the donated blood by mistake.

_____

_____

_____

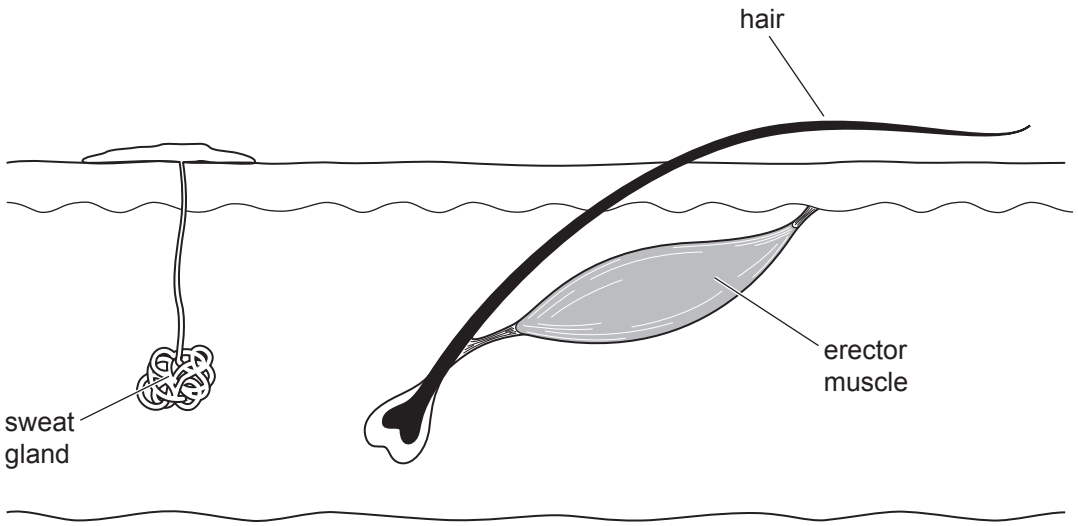
_____

_____ [4]

Examiner Only

Marks	Remark

11 The skin plays an important role in temperature regulation.



The diagram shows the skin on a hot day. Complete the table to show how the following actions help the body lose heat.

Action	How this helps heat loss
Hair lies flat	
Sweat is produced	

[4]

Examiner Only

Marks	Remark

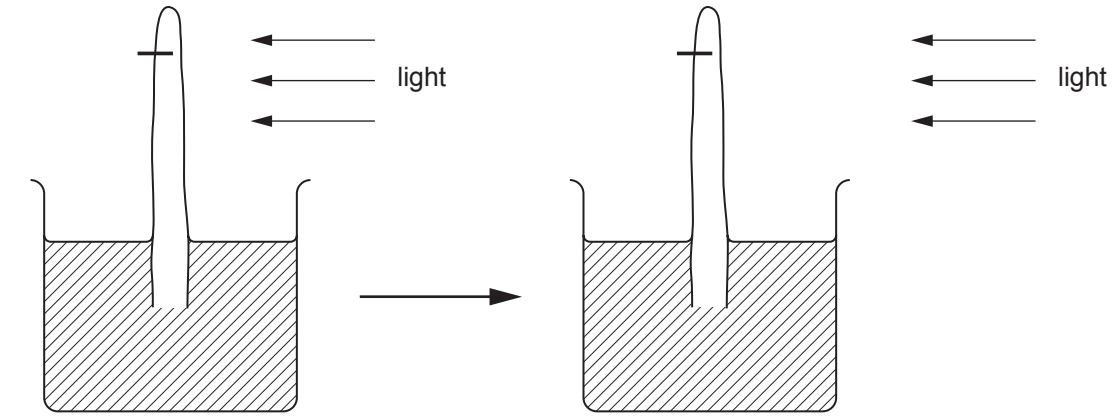
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12 An experiment was carried out to investigate the effect of light shining from one side on a plant shoot.

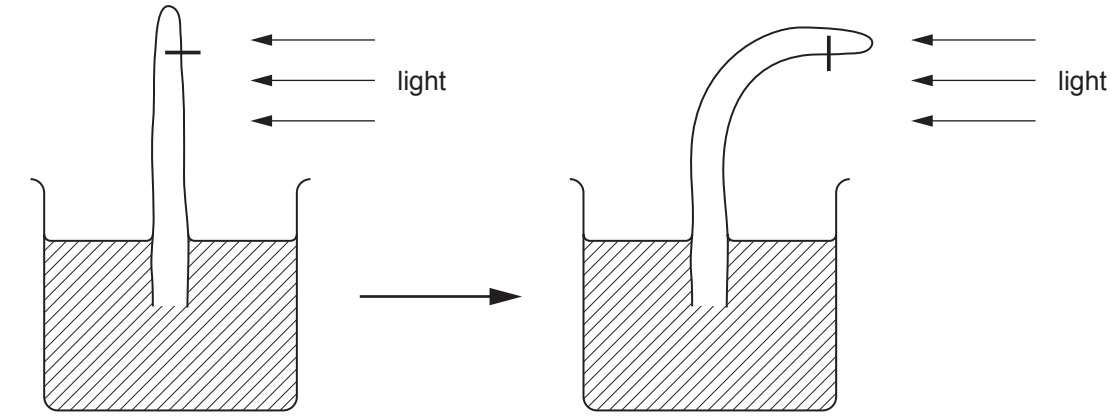
Examiner Only	
Marks	Remark



small sheet of impermeable material placed in shaded side of shoot tip

after 5 days

Experiment A



small sheet of impermeable material placed in illuminated side of shoot tip

after 5 days

Experiment B

(a) A plant hormone (auxin) causes the bending response. Auxin is produced in the tip and travels downwards to cause the cells to elongate. Use the results to explain which side of the shoot the auxin travels downwards in.

_____

_____ [2]

(b) (i) Name the response shown by the shoot in experiment B.

_____ [1]

(ii) Explain how this response will benefit the plant.

_____

_____ [2]

Examiner Only	
Marks	Remark

THIS IS THE END OF THE QUESTION PAPER

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Rewarding Learning

General Certificate of Secondary Education
2010–2011

Science: Double Award (Modular)

Living Organisms and the Processes of Life

End of Module Test

A Foundation Tier

[GDA01]

THURSDAY 24 FEBRUARY 2011, MORNING

MARK SCHEME

STEMUP.CO.UK

			AVAILABLE MARKS
1	**(a)** Calcium/Ca	[1]	
	(b) To allow water/dissolved minerals to pass through easily/transports water/allow substance pass through/no obstruction	[1]	
	(c) Leaf	[1]	3
2	**(a)** Food/meal/named food with sugar	[1]	
	(b) Insulin	[1]	
	(c) Diabetes	[1]	
	(d) It would be digested/broken down/destroyed	[1]	4
3	**(a)** Any **two** from: Food is digested from large molecules to **small(er)** molecules; from insoluble to **soluble**; so it can be absorbed/go into blood	[2]	
	(b) C and E (stomach and small intestine) [1] each	[2]	
	(c) Absorption of water	[1]	5
4	**(a)** Transpiration/evaporation	[1]	
	(b)	[2]	
	(c) Increased loss from A **or** less from B increased surface area for water absorption/A more roots **or** converse B has less roots	[2]	5
5	**(a)** **More** carbon dioxide/**less** oxygen	[1]	
	(b) Estimates not accurate/other (minor) gases make up remainder **or** named, e.g. argon/water vapour gas not accounted for	[1]	
	(c) Anaerobic	[1]	3

A	B	
48	24	= [1]
2.0	1.0	= [1]

marks for rows

			AVAILABLE MARKS
6	Any **four** from: Destarch the plant/leave in dark cupboard for 48 hrs; Then place plant in bright light for period of time; Kill leaf by boiling/boil (in water); (Hot or) **Boil** in ethanol (to remove the chlorophyll; or colour); Then place leaf in water (remove alcohol); Add iodine solution; Green region (with chlorophyll) will turn blue–black; blue–black indicates presence of starch; White region (has no chlorophyll) will turn brown/yellow; brown/yellow indicates no starch present.	[4]	4
7	**(a)** Carbon dioxide/CO_2/water/H_2O	[1]	
	(b) Any **two** from: Carbon dioxide **diffuses**; out of the blood; into lungs/across alveoli; (CO_2 is exhaled = [1]) **or** Water lost as urine; passes to the kidney; via ureter; to bladder; expelled via urethra; **or** Water lost as sweat; onto the surface of the skin. **or** Water diffuses; into lungs/alveoli; and is exhaled [1].	[2]	3
8	**(a)** Blood passes through the heart twice **in one circuit of the body**/ Blood flows from heart to lungs then back to the heart to be passed around the body	[1]	
	(b) A Pulmonary vein B Hepatic portal vein **not** hpv	[2]	
	(c) Some oxygen is **used in respiration**; by the **liver**.	[2]	5
9	**(a)** Immunisation/vaccination/active immunity	[1]	
	(b) Any **two** from: For the second injection the response is quicker; a higher level of antibody production; the level of antibodies remains higher	[2]	
	(c) Phagocytosis	[1]	4

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		AVAILABLE MARKS
10	**(a)** Blood is under **too high pressure** in artery [1]	
	(b) Any **four** from: more H_2O **outside**/more dilute solution outside there is a higher water concentration outside the cell/lower water **inside** the cell; so water moves into the blood **cells**; across a partially permeable membrane; the cells would burst; as they do not have a cell wall [4]	5
11	Any **two** from each	
	Air movements/air is not trapped/allows air to move Remove warm air/heat is not trapped/air is not an insulator Heat lost by radiation/or convection **Evaporation** of water; Cooling effect on the skin; Heat lost by radiation [4]	4
12	**(a)** Auxin is present in the left/hand side/shaded side; the impermeable sheet prevents its downward movement [2]	
	(b) **(i)** Phototropism [1]	
	(ii) Plant gets **more** light So more photosynthesis/more growth or better photosynthesis [2]	5
	Total	**50**

Rewarding Learning

Centre Number

71	

Candidate Number

General Certificate of Secondary Education
2010–2011

Science: Double Award (Modular)

Living Organisms and the Processes of Life
End of Module Test

A Foundation Tier

[GDA01]

GDA01

WEDNESDAY 10 NOVEMBER 2010, AFTERNOON

TIME

45 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all twelve** questions.

INFORMATION FOR CANDIDATES

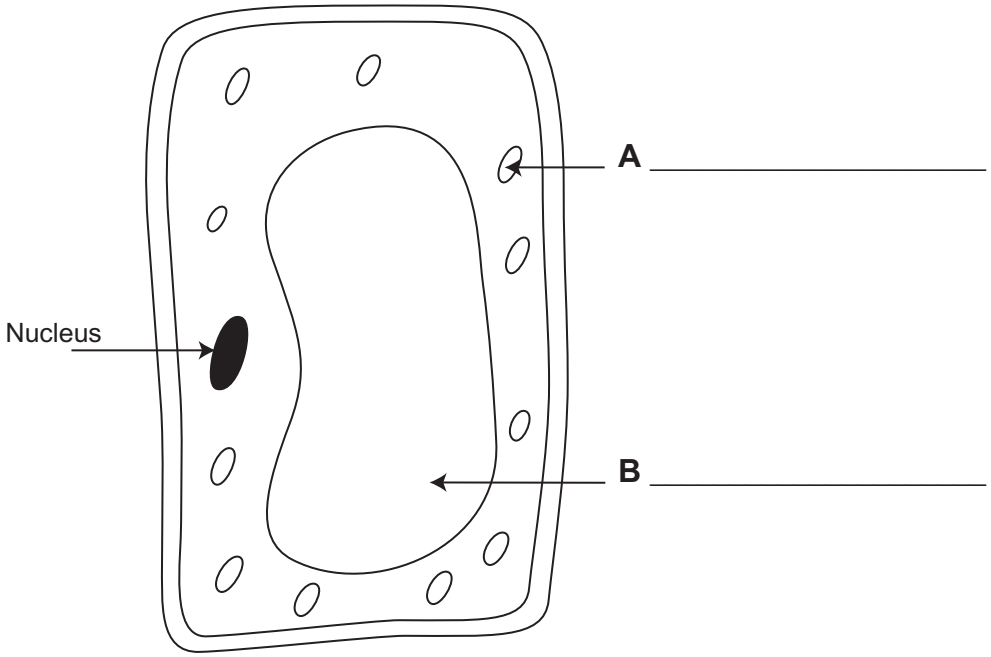
The total mark for this paper is 50.
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For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
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10	
11	
12	
Total Marks	

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Examiner Only	
Marks	Remark

1 Amy observed this cell through a microscope.



(a) Label parts **A** and **B** on the diagram. [2]

(b) Give one way that Amy knows that this is a plant cell.

_____ [1]

(c) Give a function of the nucleus.

_____ [1]

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2 **(a)** Complete the table about vitamins and their sources in the diet.

Vitamin	Source
	Citrus fruit
Vitamin D	

[2]

(b) **(i)** Name the food test you would use to test a biscuit for sugar.

_____ [1]

(ii) Describe the result you would obtain if sugar was present.

_____ [1]

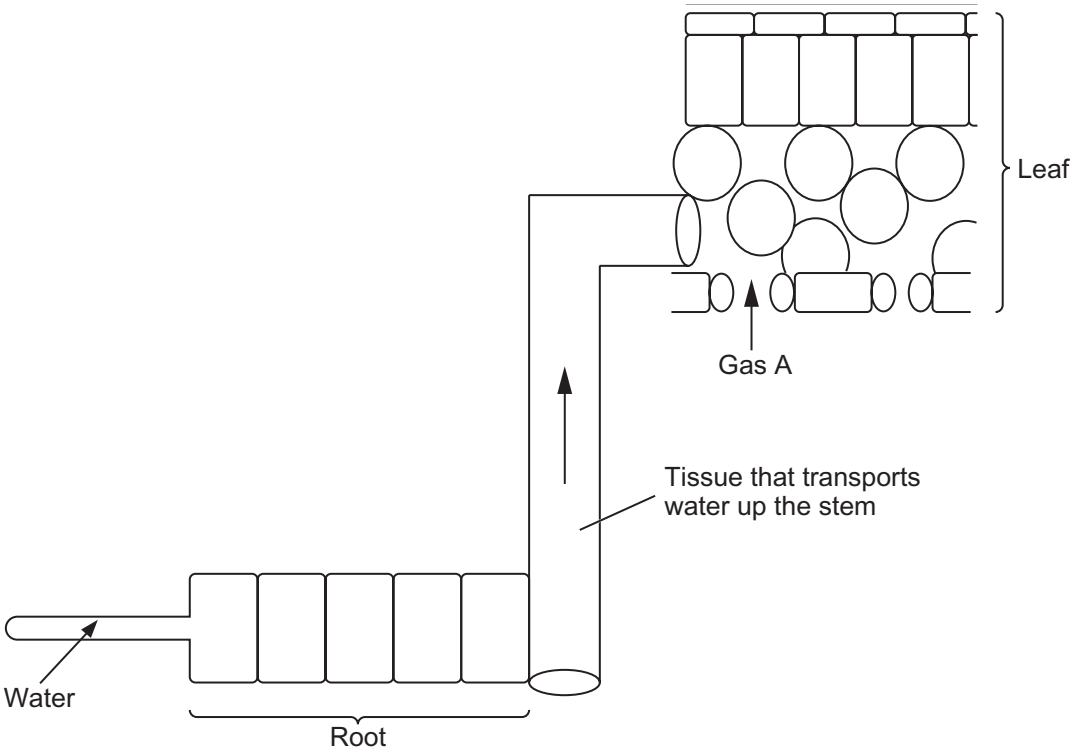
Examiner Only

Marks	Remark

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3 The diagram shows structures involved in plant transport.

Examiner Only	
Marks	Remark



(a) Use the diagram and your knowledge to name:

(i) the type of cell that absorbs water from the soil;

_____ [1]

(ii) the tissue that transports water up the stem.

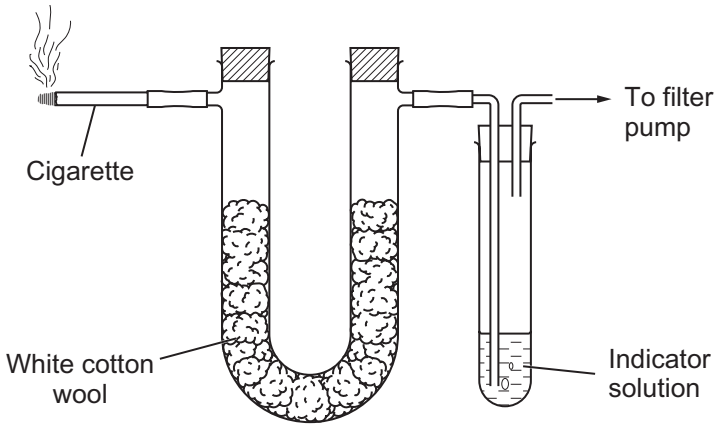
_____ [1]

(b) If the plant is kept in **darkness**, name gas A that enters the leaf through the stomata.

_____ [1]

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4 The diagram shows a "smoking machine".



(a) Suggest the name of the chemical present in cigarette smoke that causes the cotton wool to turn yellow and can lead to lung cancer.

_____ [1]

(b) Explain why smoking cigarettes causes less oxygen to be carried in the blood.

_____

_____

_____ [2]

(c) Apart from causing lung cancer, give one other way the body is harmed by smoking cigarettes.

_____ [1]

Examiner Only

Marks	Remark

STEMUP.CO.UK

Examiner Only	
Marks	Remark

5 Testing a leaf for starch includes the stages listed below.
The stages are not in the correct order.

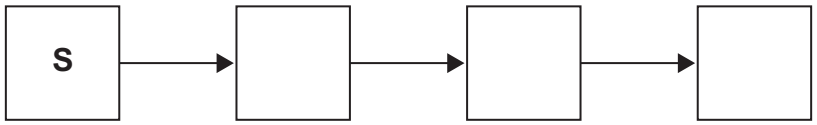
Stage P: Iodine added

Stage Q: Leaf boiled in alcohol

Stage R: Leaf softened in hot water

Stage S: Leaf boiled in water

(a) Fill in the boxes to complete the order in which these stages are carried out.



[1]

(b) Explain why the leaf is boiled in alcohol (Stage Q).

_____ [1]

(c) The equation for photosynthesis is given below.

$$\text{Carbon dioxide} + \text{Water} \xrightarrow{\text{Light absorbed by chlorophyll}} \text{Glucose} + \text{Oxygen}$$

State one way in which the plant uses the glucose made.

_____ [1]

Examiner Only	
Marks	Remark

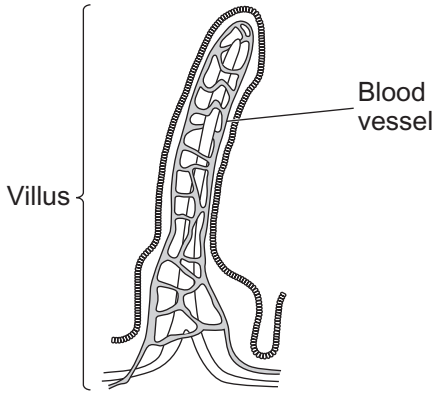
6 In digestion, large food molecules are broken down into smaller ones that can be absorbed.

(a) Complete the table below about the role of enzymes in digestion.

Enzyme	Large food molecule	Small food molecule(s)
Amylase	Starch	Sugar
Protease	Protein	
Lipase	Fats	

[3]

(b) The diagram shows a villus from the human digestive system.



(i) Name the part of the digestive system where villi are present.

_____ [1]

(ii) Explain the importance of having thousands of villi in this part of the digestive system.

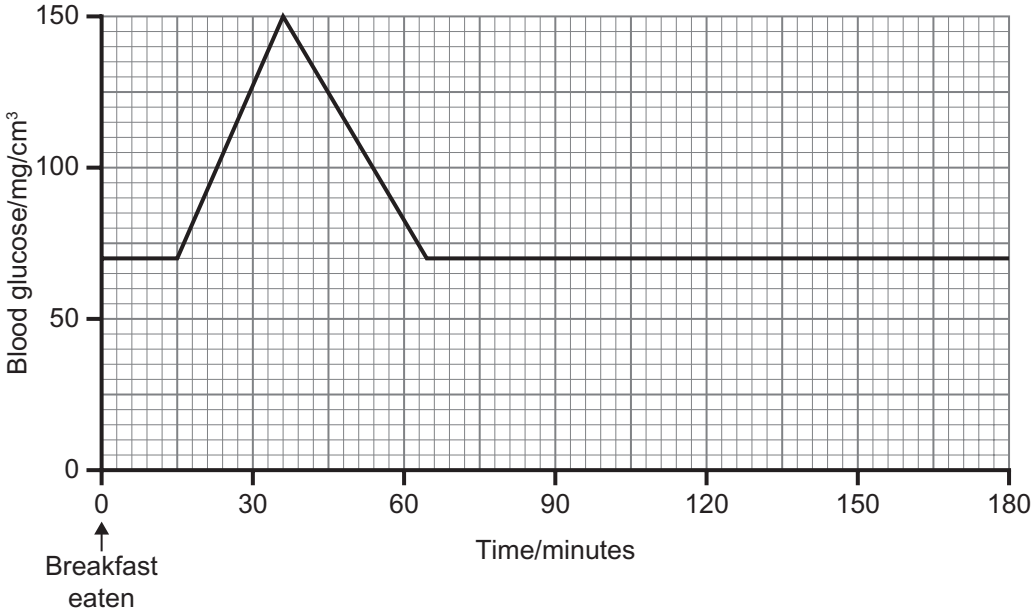
_____

_____ [2]

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Examiner Only	
Marks	Remark

7 The graph shows changes in Mary's blood glucose levels after she ate breakfast.



(a) Suggest why the blood glucose level did not start to increase for 15 minutes after Mary had eaten breakfast.

_____ [1]

(b) Name the hormone that causes the blood glucose level to return to normal.

_____ [1]

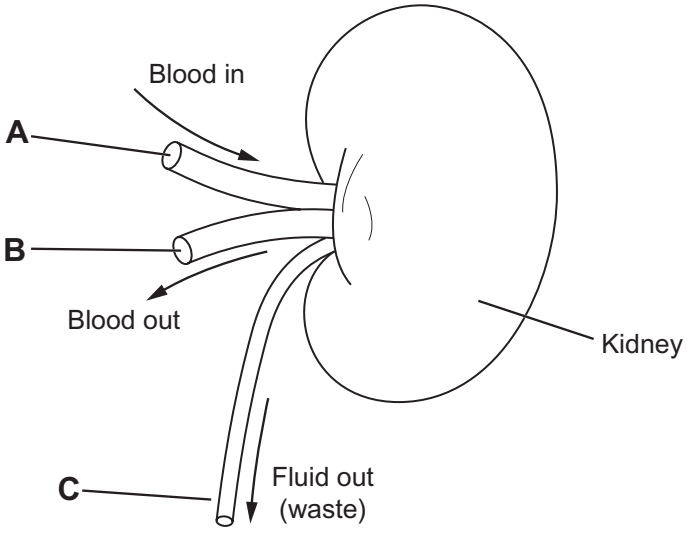
(c) Suggest one way in which this hormone causes the glucose levels to fall.

_____ [1]

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Examiner Only	
Marks	Remark

8 The kidney controls the water content of the body and removes waste from the blood.



(a) Name blood vessel **A**.

_____ [1]

(b) Suggest one substance that you would expect to be at a higher concentration in blood vessel **A** compared to blood vessel **B**.

_____ [1]

(c) Where is the fluid in **C** taken to for temporary storage?

_____ [1]

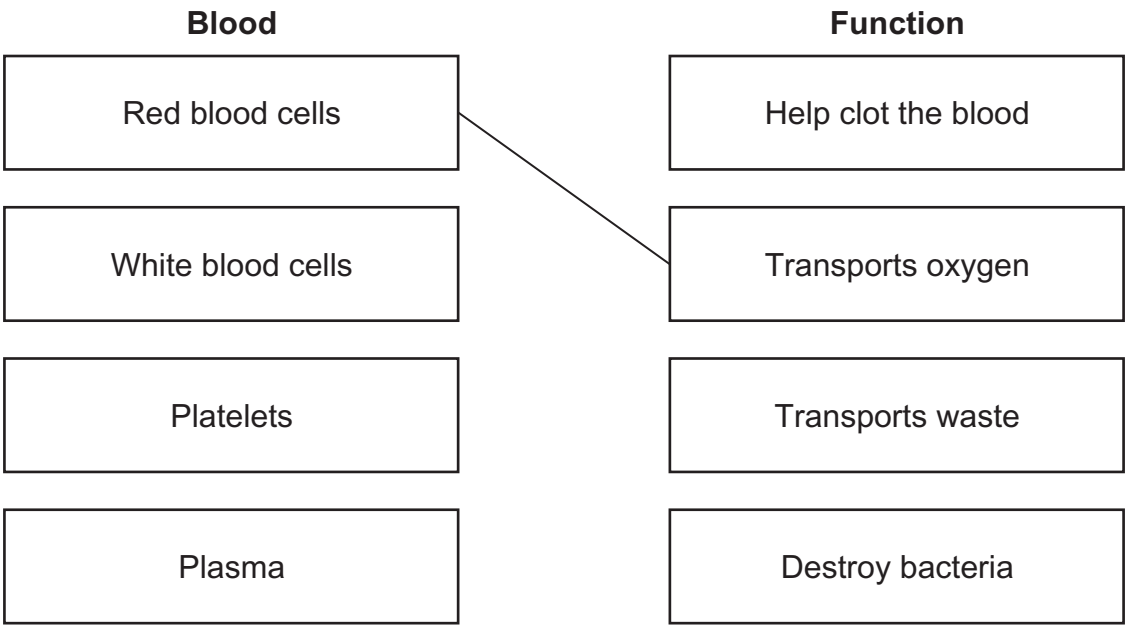
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Examiner Only	
Marks	Remark

9 The blood is made up of cells, plasma and platelets.

(a) Draw one line from each blood component to its function.

One example has been completed for you.



[2]

(b) The heart is supplied with blood by the coronary artery.

Explain why eating too much animal fat can cause a heart attack.

_____

_____

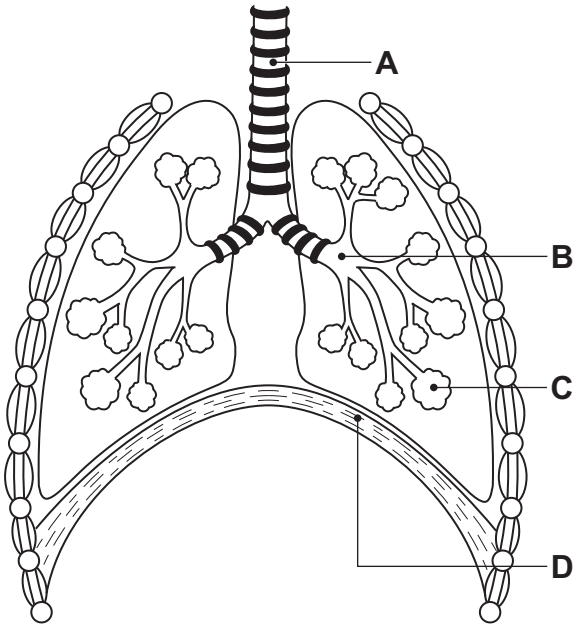
_____

_____

_____ [3]

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10 The diagram shows the human respiratory system.



(a) Which letter, **A**, **B**, **C** or **D** points to a bronchus?

_____ [1]

(b) Name the process by which oxygen moves from the alveoli into the blood.

_____ [1]

(c) Describe and explain the mechanism of inhalation (breathing in).

_____

_____

_____

_____

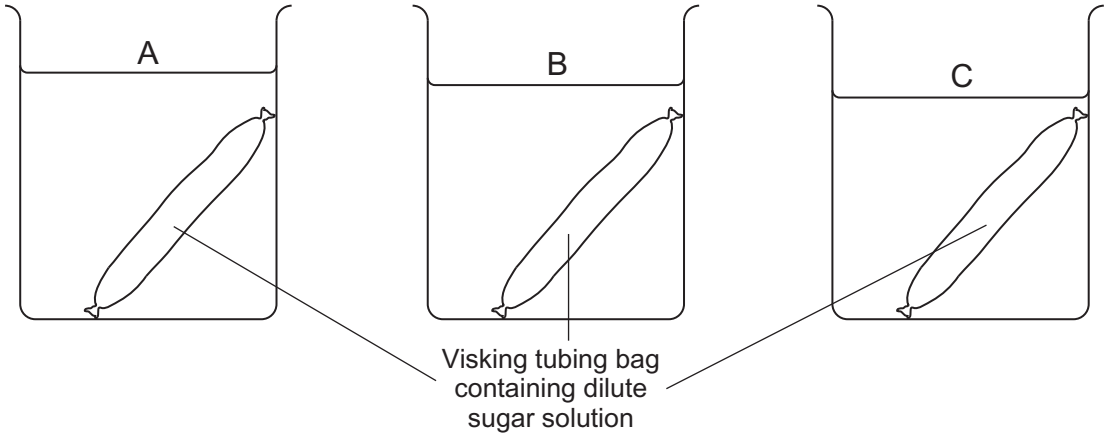
_____ [4]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

11 Paul filled three Visking tubing bags with dilute sugar solution as shown in the diagram. Visking tubing is selectively permeable.
He then placed each bag into one of three beakers, A, B and C.
One beaker contained water, another dilute sugar solution and the other concentrated sugar solution.



After being weighed the bags were left in the beakers for one hour. They were then removed, excess liquid on the outside dried and the bags reweighed. The results are shown in the table.

Beaker	Mass of Visking tubing bag at start/g	Mass of Visking tubing bag after one hour/g	Change in mass/g
A	10.0	14.9	+4.9
B	10.0	10.0	0
C	10.0	6.4	–3.6

(a) Use the results to work out which fluid was in each beaker. Write the letter of the correct beaker in the appropriate box.

Concentrated sugar solution – beaker ☐

Dilute sugar solution – beaker ☐ [2]

(b) Explain why the Visking tubing in beaker A increased in mass.

_____

_____

_____

_____ [3]

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12 **(a)** Name the type of micro-organism that causes the disease athlete's foot.

_____ [1]

(b) Describe how the body defends itself against bacteria that have entered the bloodstream.

_____

_____

_____

_____

_____ [3]

Examiner Only	
Marks	Remark

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Rewarding Learning

General Certificate of Secondary Education
2010–2011

Science: Double Award (Modular)

Living Organisms and the Processes of Life
End of Module Test

Foundation Tier

[GDA01]

WEDNESDAY 10 NOVEMBER, AFTERNOON

MARK SCHEME

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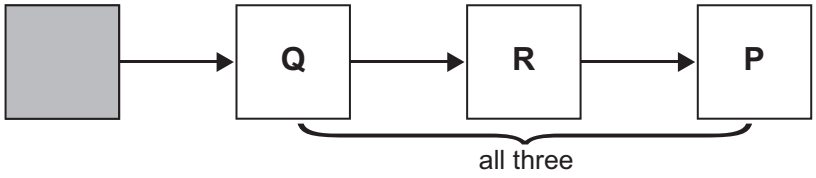
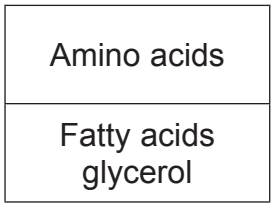
		AVAILABLE MARKS
1	**(a)** A – chloroplast/chlorophyll B – vacuole [2]	
	(b) Cell wall/vacuole/chloroplasts/regular shape or described [1]	
	(c) Contains chromosomes/genes/controls the cell or reaction/stores DNA/contains **genetic** info [1]	4
2	**(a)**	

Nutrient	Source
Vitamin C	
	Butter/egg yolk/margarine/ fish oil/cod or halibut/milk

[2]

	(b) **(i)** Benedicts; [1]	
	(ii) orange-red colour if sugar is present [1]	4
3	**(a)** **(i)** Root *hair cell* [1]	
	(ii) Xylem [1]	
	(b) Oxygen/O_2 [1]	3
4	**(a)** Tar [1]	
	(b) Any **two** from: carbon monoxide; binds to red blood cells/haemoglobin; displaces O_2/higher affinity or described; irreversible reaction [2]	
	(c) heart disease/irregular or increasing heartbeat/emphysema/ bronchitis/gangrene/other mouth/throat cancer/heart attack/stroke [1]	4

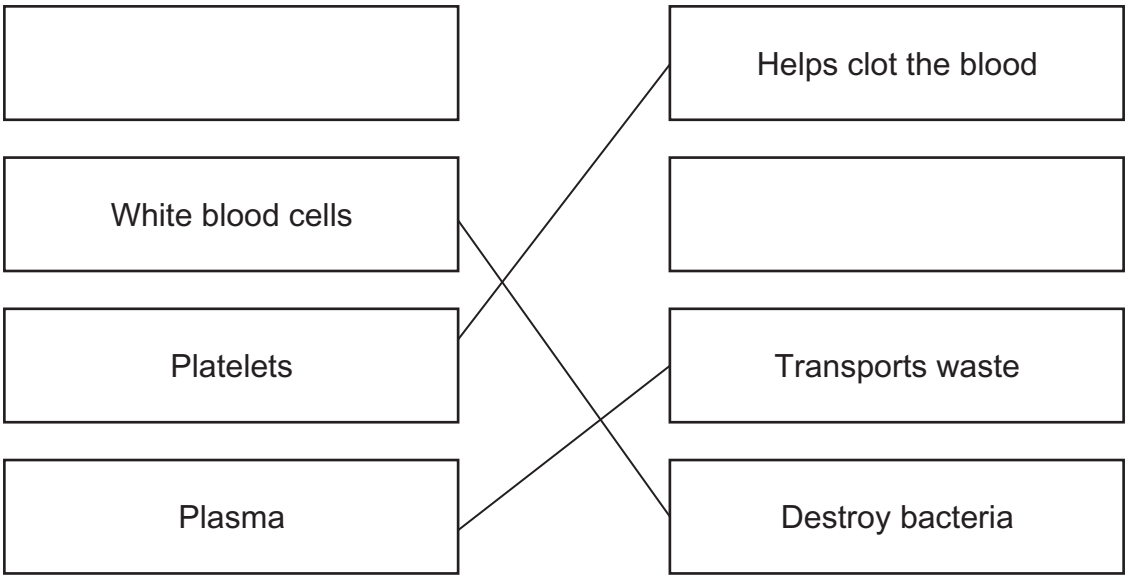
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			AVAILABLE MARKS
5	**(a)**	 [1]	
	(b)	To remove chlorophyll/green pigment/decolorize [1]	
	(c)	Converted to sucrose/cellulose/starch/fat/oil/protein/respired [1]	3
6	**(a)**	 [3]	
	(b)	**(i)** Small intestine/ileum [1]	
		(ii) large surface area; maximum absorption or described for diffuse/ help uptake [2]	6
7	**(a)**	Takes this time for the food to be **digested/absorbed**/time get into the blood [1]	
	(b)	Insulin [1]	
	(c)	Causes more glucose to be respired/or converted to glycogen/to be taken up into the cells/converted into fat [1]	3

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			AVAILABLE MARKS
8	**(a)** Renal artery	[1]	
	(b) Glucose/oxygen/urea/amino acids/water/salts/ammonia	[1]	
	(c) Bladder	[1]	3

9 **(a)**



All 3 correct = [2]
1 correct = [1] [2]

(b) Any **three** from:
cholesterol;
causes blockage/clot/clogging up;
reduced blood flow;
less glucose/oxygen pass;
less respiration/energy;
for the heart muscle to contract/heart muscle die [3] 5

10 **(a)** B [1]

(b) Diffusion [1]

(c) Any **four** from:
Diaphragm contracts;
diaphragm pulls down/flattens;
Intercostal muscles (contract);
ribs move up/out;
volume of thorax increases; pressure in thorax decreases [4] 6

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				AVAILABLE MARKS
11	**(a)**	Concentrated sugar solution **C** Dilute sugar solution **B**	[2]	
	(b)	Any **three** from: more water molecules **outside**/less water molecules **inside**/more dilute solution outside; water molecules **move into** the Visking tubing; by osmosis; across a selectively permeable membrane	[3]	5
12	**(a)**	Fungus	[1]	
	(b)	Any **three** from: Antigens on the bacteria surface; stimulates white blood cells/lymphocytes; to produce antibodies; antibodies join with the antigens/complementarity of antibody and antigen/lock to antigens; clump forms; which is ingested/digested by phagocytes/phagocytosis engulf/surround/ingest; digest/broken down; phagocyte or WBC	[3]	4
			Total	**50**

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Rewarding Learning

Centre Number	
71	

Candidate Number

General Certificate of Secondary Education
2009–2010

Science: Double Award (Modular)

Living Organisms and the Processes of Life
End of Module Test
Foundation Tier

GDA01

A **[GDA01]**

THURSDAY 20 MAY 2010, MORNING

TIME

45 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all twelve** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 50.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

For Examiner's use only	
Question Number	**Marks**
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
Total Marks	

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1 Complete the table below about food types.

Food type	Example of source	Test
Sugar	Cakes	
	Citrus fruits	DCPIP
Protein		Biuret

[3]

Examiner Only

Marks	Remark

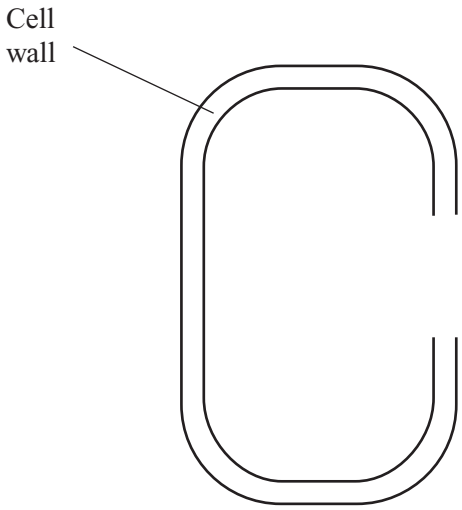
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Examiner Only	
Marks	Remark

2 Plants take up water and minerals using their root hair cells.

(**a**) The drawing below shows a partially completed root hair cell.

Complete the drawing by adding the remaining part of the cell wall and adding and labelling the vacuole and nucleus.



[3]

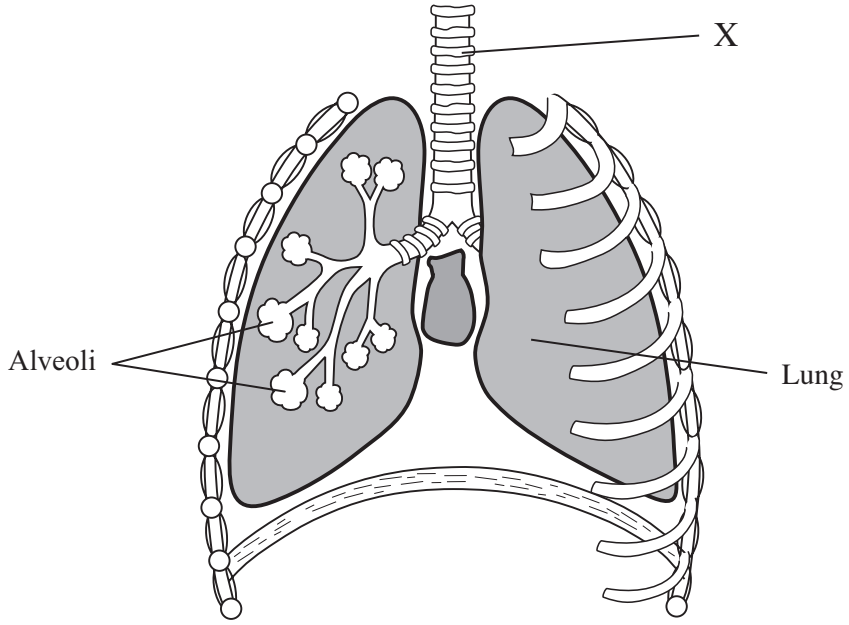
(**b**) Complete the table about minerals used by plants.

Mineral	**Function**
	Cell wall formation
Magnesium	
Nitrogen (nitrate)	

[3]

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3 The diagram shows part of the respiratory system.



© Key Stage 4 revision GCSE Science Single and Double Award by Bob McDuell, Keith Hirst and Graham Booth, published by Stanley Thornes, 1998, ISBN 0748736670

(a) Name the part labelled X.

_____ [1]

(b) On the diagram, draw an arrow on the diaphragm to show the direction it moves during inhalation. [1]

(c) **(i)** Name the substance in cigarette smoke that causes lung cancer.

_____ [1]

(ii) Describe and explain the effect that carbon monoxide in cigarette smoke has on the body.

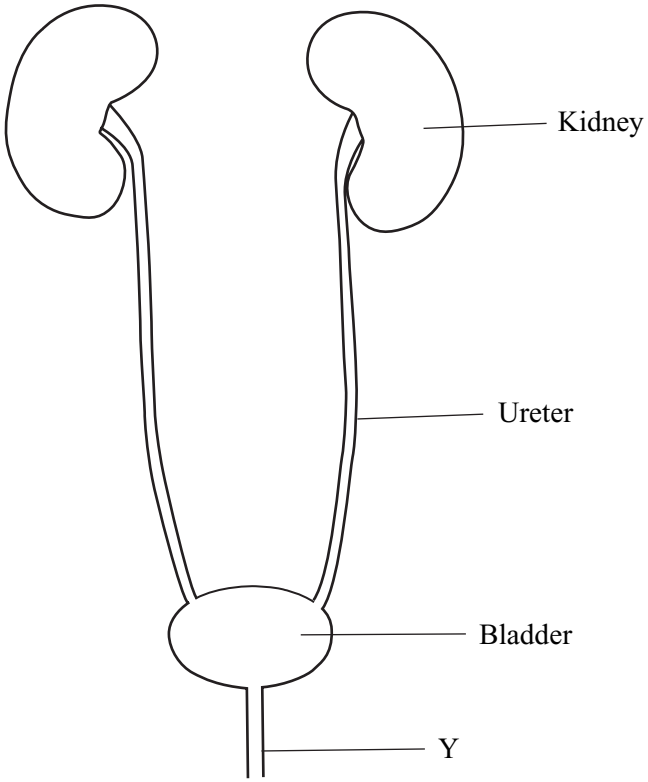
_____

_____ [2]

Examiner Only	
Marks	Remark

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4 The diagram shows part of the excretory system.



(a) (i) Name part Y.

_____ [1]

(ii) On the diagram, draw in the sphincter muscle. [1]

(b) What is meant by the term **osmoregulation**?

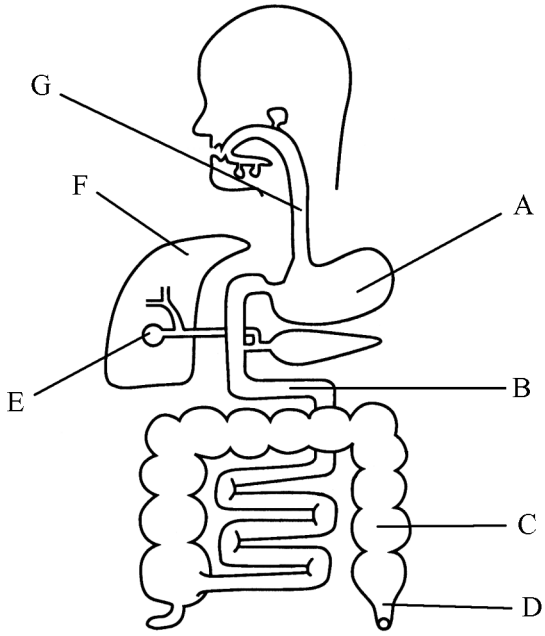
_____ [1]

Examiner Only

Marks	Remark

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5 The diagram shows the digestive system.



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Complete the table by adding the letter of the structure to match the process.

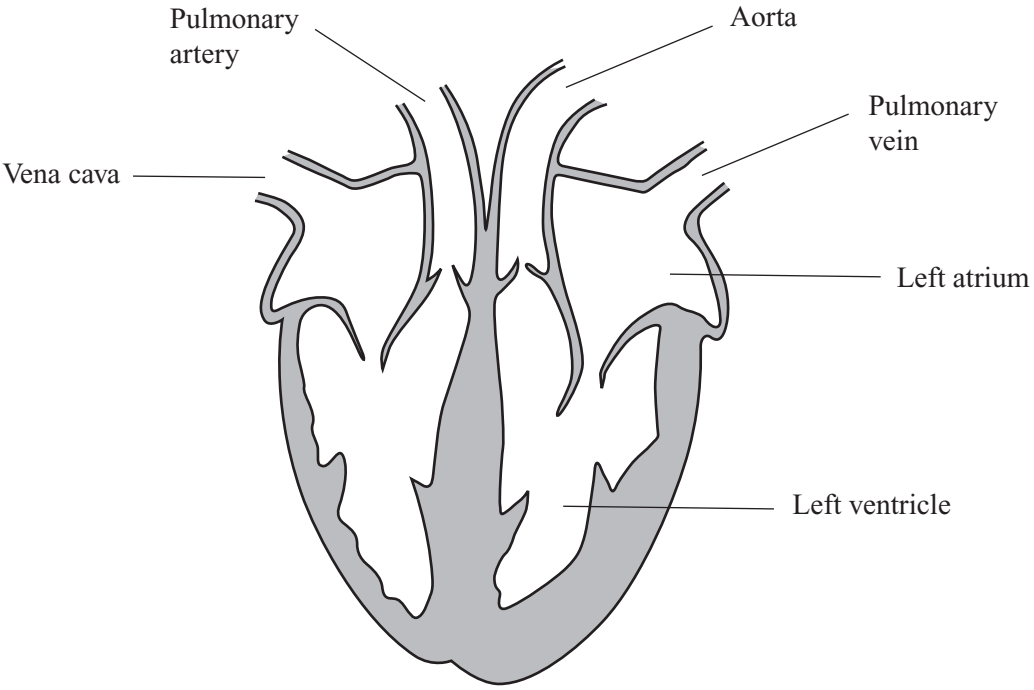
Process	Structure (give letter)
Protein digestion begins	
Water is reabsorbed	
Carbohydrate, fat and protein digestion **all** occur	
Bile is stored	

[4]

Examiner Only

Marks	Remark

6 The heart pumps blood around the body.



© CCEA

(a) (i) Add arrows to the diagram to show the flow of blood through the heart. [2]

(ii) Name **one** blood vessel shown on the diagram that carries deoxygenated blood.

_____ [1]

(b) What is the function of the plasma?

_____ [1]

Examiner Only

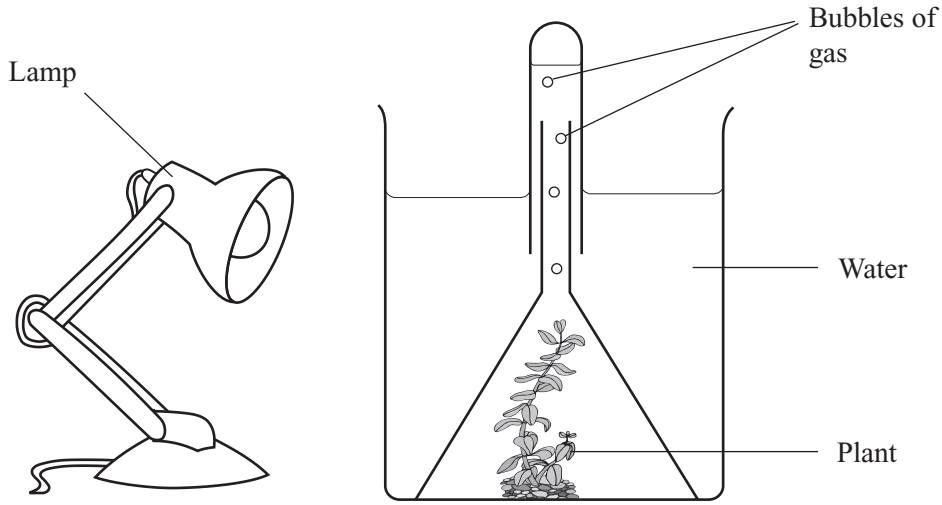
Marks	Remark

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Examiner Only	
Marks	Remark

7 This apparatus was set up to measure the rate of photosynthesis in different light intensities.

The rate of photosynthesis was measured by counting the number of bubbles of gas leaving the plant in a given time.



(a) Suggest one way of varying the light intensity in this experiment.

_____ [1]

(b) Name the gas present in the bubbles.

_____ [1]

(c) Suggest a more accurate method of measuring the rate of photosynthesis than counting the bubbles of gas released in a given time.

_____

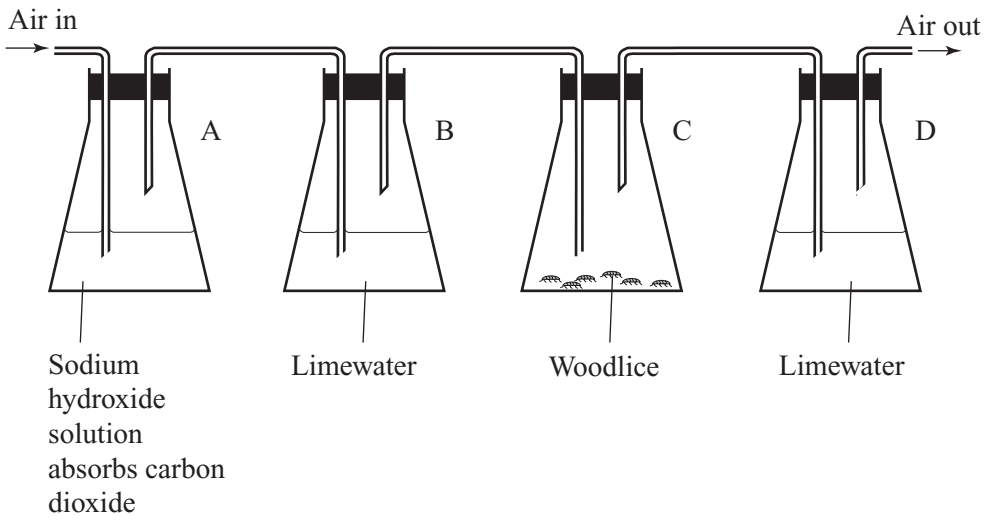
_____ [2]

(d) Apart from light intensity, name **one** other factor that will affect the rate of photosynthesis in the water plant.

_____ [1]

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8 The diagram shows an investigation using woodlice.



Limewater changes from clear to cloudy with an increase in the carbon dioxide level.

(a) Name the process being investigated.

_____ [1]

(b) What is the purpose of flask B?

_____ [1]

(c) What colour would you expect the limewater in flask D to be at the end of the experiment?

_____ [1]

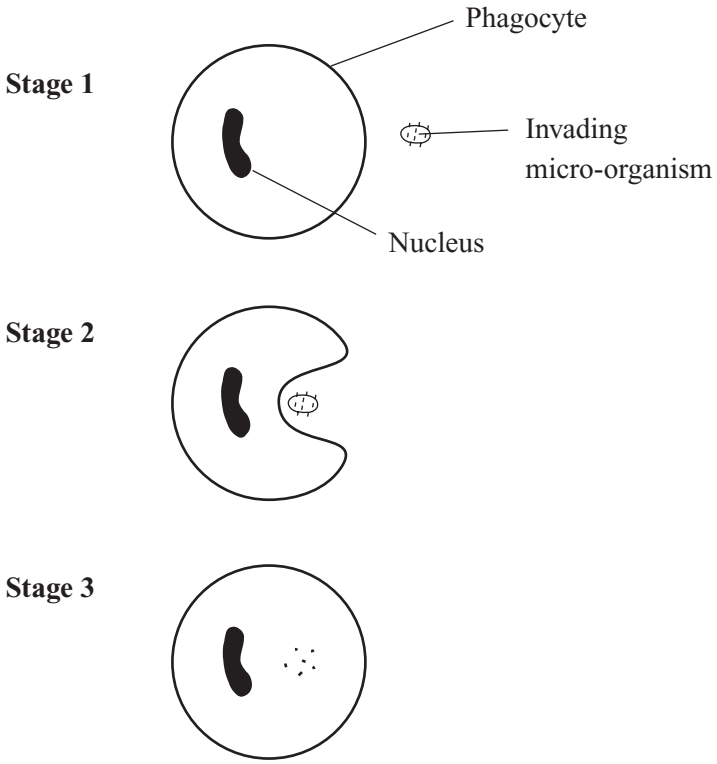
Examiner Only

Marks	Remark

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Examiner Only	
Marks	Remark

9 The diagram shows one way in which the body defends itself against micro-organisms.



(a) Suggest what type of blood cell is a phagocyte.

_____ [1]

(b) Describe what is happening at:

Stage 2 _____

Stage 3 _____ [2]

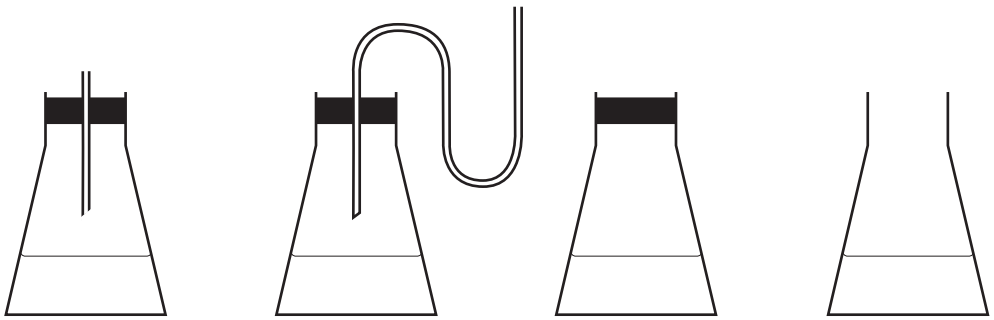
(c) Describe another way in which the body defends itself once micro-organisms have entered the bloodstream.

_____ [1]

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10 The diagram shows an experiment similar to one carried out by Pasteur.

All flasks contained sterile broth at the start of the experiment. Sterile broth is clear.



A B C D

The apparatus was left for one week at room temperature.

(a) Complete the results table below by placing a tick (✔) if you would expect the broth to be contaminated with micro-organisms after a week, or an ✘ if you would expect the broth to be uncontaminated.

Flask	Contaminated/uncontaminated after one week
A	
B	
C	
D	

[3]

(b) Name the theory that the results of Pasteur's experiment disproved.

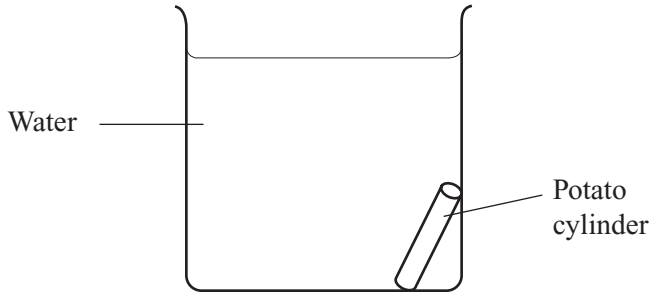
_____ [1]

Examiner Only

Marks	Remark

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11 The diagram shows a potato cylinder that has just been put into a beaker of water.



The cylinder was left in the water for 24 hours.

Describe and explain the change in the potato cylinder after 24 hours.

Description: _____

Explanation: _____

_____

_____

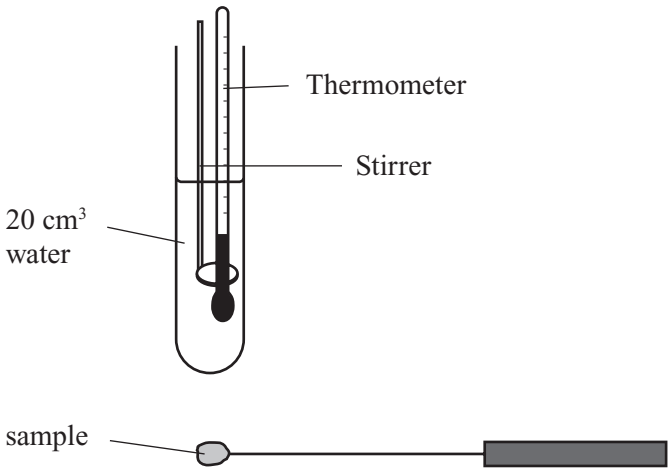
_____

_____ [4]

Examiner Only	
Marks	Remark

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12 The energy value of foods can be compared using the apparatus shown in the diagram.



(a) Using the apparatus and any additional materials, describe how you would compare the energy values of equal masses of biscuit and bacon.

_____

_____

_____

_____

_____

_____

_____

_____ [4]

(b) How would you expect the results for the biscuit and the bacon to differ?

_____ [1]

Examiner Only

Marks	Remark

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GCSE

Science: Double Award (Modular)

End of Module Tests

May 2010

Mark Schemes

Issued: October 2010

Rewarding Learning

General Certificate of Secondary Education
2009 – 2010

Science: Double Award (Modular)

Living Organisms and the Processes of Life
End of Module Test
Foundation Tier

[GDA01]

THURSDAY 20 MAY 2010, MORNING

MARK SCHEME

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AVAILABLE MARKS

1

		Benedicts
Vitamin C		
	Meat, eggs, fish etc Milk/pulses/nuts/ chicken/soya	

[3] 3

2 **(a)** Cell extension drawn in correctly; with two lines for cell wall
Nucleus drawn in correct place (i.e. in cytoplasm) and labelled;
Vacuole correctly drawn and labelled [3]

(b)

Calcium/Ca	
	Chlorophyll Chloroplasts
	Amino acids/proteins

[3] 6

3 **(a)** Trachea/windpipe/ring of cartilage/cartilage [1]

(b) Arrow points downwards
from diaphragm [1]

(c) **(i)** Tar [1]

(ii) Any **two** from:
Binds to red blood cells/haemoglobin;
Irreversible;
Displaces oxygen/takes place of oxygen/less oxygen carried;
greater affinity (for haemoglobin) [2] 5

4 **(a)** **(i)** Urethra [1]

(ii) Sphincter muscle drawn below bladder in correct position [1]

(b) **Control** of water level/**regulation** of water in body [1] 3

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					AVAILABLE MARKS
5					
	A – stomach C – large intestine/colon B – duodenum/ileum/small intestine E – gall bladder			[4]	4
6	**(a)**	**(i)**	Arrows enter vena cava, into right ventricle, up through pulmonary artery; Arrows in through pulmonary vein, into left ventricle, up through aorta 1 mark each side	[2]	
		(ii)	Vena cava/pulmonary artery	[1]	
	(b)		Transport/transport of food or waste/carry blood cells platelets/CO_2/ vitamins/minerals/hormones	[1]	4
7	**(a)**		Move lamp/stronger or weaker bulb	[1]	
	(b)		Oxygen/O_2	[1]	
	(c)		Use a graduated tube; Measure **volume** of gas released/collect gas then measure volume Measure **amount** of gas [1] syringe	[2]	
	(d)		Carbon dioxide/temperature/**amount** of chlorophyll	[1]	5
8	**(a)**		Respiration	[1]	
	(b)		To **show/prove** that there is no carbon dioxide present	[1]	
	(c)		Cloudy/milky/white	[1]	3
9	**(a)**		White blood cells/white	[1]	
	(b)		Stage 2: Ingestion/engulfing/eating (swallows)/surrounds; Stage 3: Digestion/broken down/destroys/dissolves	[2]	
	(c)		**Active** immunity/production of antibodies	[1]	4

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			AVAILABLE MARKS
10	**(a)**	✓ ✗ ✗ ✓ [3]	
		4 correct – [3] marks 3 correct – [2] marks 2 correct – [1] marks	
	(b)	**Spontaneous** generation [1]	4
11		Any **four** from: **Description**: Cylinder increases in size/length/expands/turgid/firmer/heavier **Explanation**: High concentration of water **outside cylinder**; So water moves in; by osmosis; across a selectively permeable membrane 1 mark for description wherever it occurs within the answer. [4]	4
12	**(a)**	Any **four** from: Take initial temperature of water; Set food alight/at start; Hold burning food at a set distance from base of tube; Stir water; Take final temperature/work out difference (change in temp); Replace water (with fresh water); repeat for second food sample/or same volume of water; Do repeats (to improve reliability) Completely burn food [4]	
	(b)	Bacon has more energy/larger increase in temperature bacon burns longer [1]	5
		Total	**50**

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GCSE

Science: Double Award (Modular)

End of Module Tests

March 2010

Mark Schemes

Issued: May 2010

Rewarding Learning

General Certificate of Secondary Education
2009 – 2010

Science: Double Award (Modular)

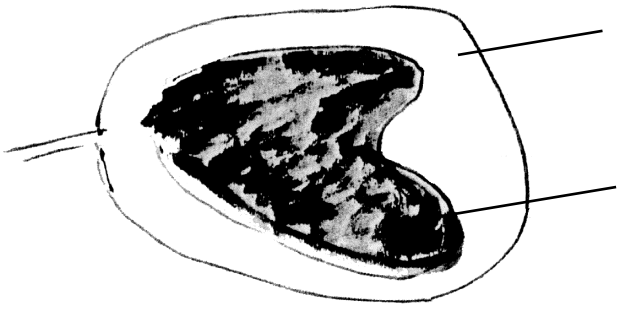
Living Organisms and the Processes of Life
End of Module Test
Foundation Tier

[GDA01]

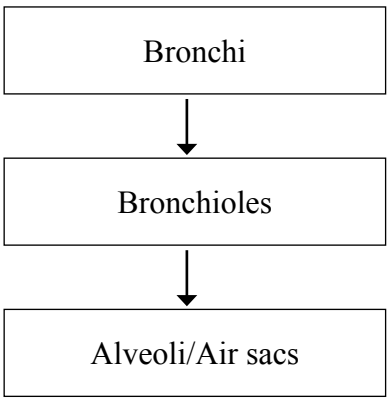
WEDNESDAY 24 FEBRUARY, MORNING

MARK SCHEME

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				AVAILABLE MARKS
1	**(a)**	Chloroplasts/chlorophyll – not shape (not vacuole not cell wall)	[1]	
	(b)	**(i)** Cilia	[1]	
		(ii) Respiratory tract/oviduct/trachea/bronchi	[1]	
	(c)	Chromosomes/genes	[1]	4
2	**(a)**	A – eyepiece lens B – Stage	[2]	
	(b)	× 10 × 10 / × 100	[1]	3
3	**(a)**	Any **three** from: Boil leaf in water; Boil in alcohol; **needs boil** To remove chlorophyll/colour; Soften leaf/dip in warm water; Place on white tile; Add Iodine solution Stages not correct order –1	[3]	
	(b)	 Brown/yellow/orange or red with one of these other colours [not red on its own] Blue/Black or black not purple not blue on its own	[2]	5
4	**(a)**	9 units + 2.5 units } [1] 11.5 units [1]	[2]	
	(b)	Will become obese/overweight/liver damage/brain damage/liver disease	[1]	3
5	**(a)**	DCPIP	[1]	
	(b)	A	[1]	
	(c)	Prevents scurvy/healthy gums	[1]	3

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				AVAILABLE MARKS
6	**(a)**		[3]	
	(b)	Any **two** from: Large surface area/lots alveoli; Good blood supply; Thin walls/one cell thick/permeable; Moist;	[2]	5
7	**(a)**	Antibodies; made by mother/coming from mother	[2]	
	(b)	Placenta/umbilical cord	[1]	
	(c)	Fast acting/protection without exposure to the disease	[1]	4
8	**(a)**	A – Aorta B – Pulmonary vein C – Left atrium	[3]	
	(b)	Left side of heart shaded	[1]	
	(c)	Muscle D pumps blood round the body/or E only has to pump to lungs	[1]	5
9	**(a)**	A – iris; Controls amount of light that enters the eye/protects eye	[2]	
	(b)	Bending of rays at cornea/or lens; Focus onto retina	[2]	4

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				AVAILABLE MARKS
10	**(a)**	So that it can be absorbed/so can get into bloodstream	[1]	
	(b)	A	[1]	
	(c)	Protein ⟶ Amino acids — Both needed Starch ⟶ Glucose/(not carbohydrate) Sugar/ Maltose — Both needed	[2]	4
11	**(a)**	All points correct = 2 3 – 4 points correct = 1 Line = 1	[3]	
	(b)	As light increases, it takes less time for discs to rise/quicker group; More oxygen; more photosynthesis.	[3]	6
12	**(a)**	Osmosis	[1]	
	(b)	Maintain concentration gradient/or create one/ or describe more H_20 outside than inside root cells; To allow **water intake**/prevent water loss; For photosynthesis/described turgor/solvent.	[3]	4
			Total	**50**

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