CCEA GCSE BIOLOGY (2003 SPECIFICATION)

BIOLOGY



EXAM QUESTION PACK

PAPER 2 FOUNDATION TIER G0902 PAPERS

STEMUP

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Rewarding Learning

General Certificate of Secondary Education
2012

Science: Biology

Paper 2
Foundation Tier

[G0902]

WEDNESDAY 20 JUNE, MORNING

MARK SCHEME

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					AVAILABLE MARKS
1	(a)	(i)	Labelled line F to filament;	[1]	
		(ii)	A – Petal; B – Stigma; C – Sepal;	[3]	
		(iii)	Anther – produce pollen; Nectar – to attract insects/bees;	[2]	
		(iv)	Pollen **from** the **anther**; **To** the **stigma**;	[2]	
		(v)	Wind/bees;	[1]	
	(b)	(i)	Red and fleshy to attract birds/animals to eat; Hard coat not digested/passes through gut;	[2]	
		(ii)	Any **two** from: Self/explosive; Water; Wind;	[2]	
		(iii)	Any **one** from: Prevent overcrowding; Reduce competition for light/nutrients/water; Colonise new areas/habitats;	[1]	
		(iv)	Two bars drawn accurately;	[2]	
		(v)	Larger fruits; Better price/more profit;	[2]	
	(c)	(i)	From buds on the runner;	[1]	
		(ii)	Provides it with food (from the parent plant);	[1]	
		(iii)	New plant can photosynthesise/make own food/glucose/starch;	[1]	
		(iv)	Only one parent plant has produced the offspring/no mixing of genes;	[1]	22

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				AVAILABLE MARKS
2	(a)	(i)	A – White blood cell/cell membrane; B – Platelets; [2]	
		(ii)	Plasma; [1]	
		(iii)	Transport oxygen; [1]	
		(iv)	**Large surface area** – faster diffusion/more gas exchange; No nucleus – **More** room for haemoglobin/able to carry **more** oxygen; [2]	
	(b)	(i)	A – Aorta; B – Vena cava; [2]	
		(ii)	Hepatic portal vein correctly drawn; Label; [2]	
		(iii)	Lungs; [1]	
		(iv)	Arrow drawn from heart to lungs; [1]	
		(v)	Pulmonary vein – oxygenated/less CO_2; [1]	
		(vi)	Chamber Y – Left ventricle; Produce high pressure; Pump blood all around the body/further; [3]	
	(c)	(i)	Valves; Thinner muscle; Bigger lumen; [3]	
		(ii)	Away from heart; Vein; Capillary; [3]	22

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			AVAILABLE MARKS
3	**(a)**	A: Oesophagus; B: Liver; C: Colon; [3]	
	(b)	Long/folds; [1] Good blood supply; [1]	
	(c)	Any **one not given in (b)** from: Large surface area/villi; Moist; Permeable; Thin walls; [1]	
	(d)	Mouth (Ingestion); Mouth/stomach/small intestine (Digestion); (Colon) Absorption; (Anus) Egestion; [4]	
	(e)	**(i)** Liver; [1]	
		(ii) Emulsifies fats/breaks them down (into smaller pieces/droplets/particles); [1]	
		(iii) Neutralises; [1]	
	(f)	Enzyme; [1]	
	(g)	A – Glycerol/Fatty acid; B – Fatty acid/Glycerol; } Allow Glycerol and Fatty acid only **once** each [2]	
	(h)	Any **two** from: Small; Simple; Soluble; [2]	18

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					AVAILABLE MARKS
4	**(a)**	**(i)**	Coal/oil;	[1]	
		(ii)	Any **two** from: CO/CO_2; SO_2/SO_x; NO_2/NO_x;	[2]	
		(iii)	Soot covers leaves/blocks stomata; (Must affect outside of leaf)	[1]	
		(iv)	Less light enters leaf/less gas exchange; Less **photosynthesis**;	[1] [1]	
		(v)	Any **two** from: Renewable sources of energy; Scrubbers in factory chimneys; Catalytic converters; Increased use of public transport/example described; Increased insulation; Burn less fossil fuels; Use unleaded petrol;	[2]	
	(b)	**(i)**	Landfill;	[1]	
		(ii)	Any **two** from: Smell; Unsightly; Disease; Attracts unwanted birds/gulls/animals/rodents/foxes; Leaching of toxins to groundwater; Needs **large area** of land/damages habitats/needs long time;	[2]	
		(iii)	Incineration/burning/composting/recycling;	[1]	
	(c)	**(i)**	Knock;	[1]	
		(ii)	(Red squirrels) decreasing; (Grey squirrels) increasing; (**Reject** a description of numerical values)	[2]	
		(iii)	Any **three** from: Grey squirrels – Eat wider range of food; Outcompete reds for habitats; Higher reproduction rate; Resistant to/carrier of virus (parapox);	[3]	18

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				AVAILABLE MARKS
5	(a)	(i)	A – **Spongy mesophyll**; B – **Lower** epidermis; C – Stoma(ta); [3]	
		(ii)	Allows (maximum amount of) light into leaf/cells/mesophyll/ chloroplasts; Thin (leaf); Large **surface area** (for light absorption); [3]	
		(iii)	8 (arbitrary units); [1]	
		(iv)	Any **two** from: Thickened **inner** walls; Chloroplasts present; Smaller vacuole; No cuticle; [2]	
		(v)	Any **three** from: Carbon dioxide; / Through stomata; / By diffusion; **or** Water; / From xylem; / By osmosis; Into mesophyll cell/chloroplast/air space/vacuole/any appropriate named structure; [3]	
			Quality of written communication [2]	
	(b)	(i)	Kill the leaf/break down cuticle/cells (to allow chemicals to enter); Remove chlorophyll/green colour/decolorise leaf; [2]	
		(ii)	Any **one** from: Turn off Bunsen/no naked flames; Wear goggles; [1]	
		(iii)	Dip(ped) in water; [1]	
		(iv)	Starch; Yellow-brown to blue-black; [2]	
		(v)	Starch all used (up)/not present; By respiration; [2]	22

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					AVAILABLE MARKS
6	**(a)**	**(i)**	nn; Normal wing;	[2]	
		(ii)	Wings can't be used/can't fly; to get food/find mate/escape predators;	[2]	
		(iii)	Length of DNA/chromosome; In nucleus;	[2]	
	(b)	**(i)**	NN, Nn; Nn, nn;	[2]	
		(ii)	3:1;	[1]	
		(iii)	16, 4;	[1]	
		(iv)	4:1;	[1]	
		(v)	Any **one** from: Random process; Large numbers required/small numbers produced in this case;	[1]	
	(c)	**(i)**	Man: Testosterone; Woman: Oestrogen;	[2]	
		(ii)			

Secondary sexual characteristic	Males	Females	
Voice deepens	✓	✗	[1]
Growth of body and pubic hair	✓	✓	[1]
Menstruation begins	✗	✓	[1]
Sexual awareness	✓	✓	[1]

[4] 18

Total **120**

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Rewarding Learning

Centre Number

71	

Candidate Number

General Certificate of Secondary Education
2011

Science: Biology

Paper 2
Foundation Tier

G0902

[G0902]

THURSDAY 2 JUNE, MORNING

TIME

1 hour.

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 six** questions.

INFORMATION FOR CANDIDATES

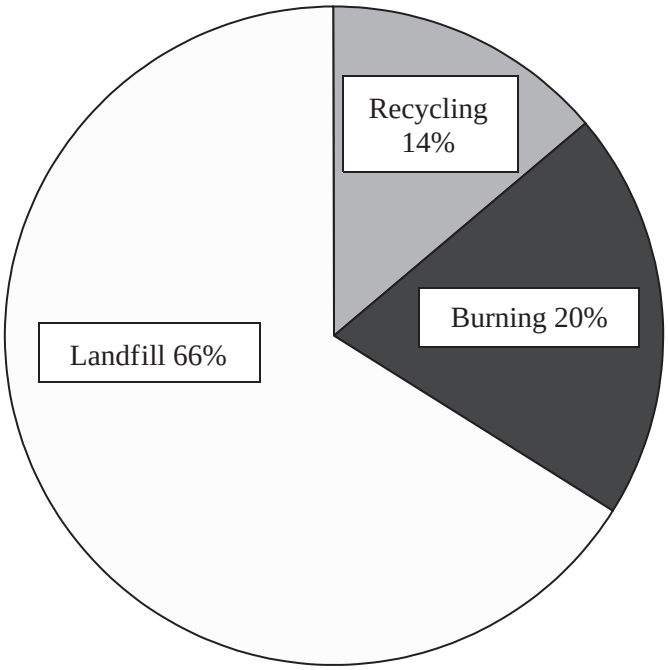
The total mark for this paper is 120.
Quality of written communication will be assessed in question **5(b)(ii)**.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
Details of calculations should be shown.
Units must be stated in numerical answers where appropriate.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
Total Marks	

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Examiner Only	
Marks	Remark

1 **(a)** The pie chart shows different ways of treating rubbish



(i) Complete the table using the information in the pie chart.

Way of treating rubbish	Percentage
Recycling	
Burning	
Landfill	

[2]

(ii) Which way of treating rubbish is used least?

_____ [1]

(iii) Describe **two** ways landfill is damaging to the environment.

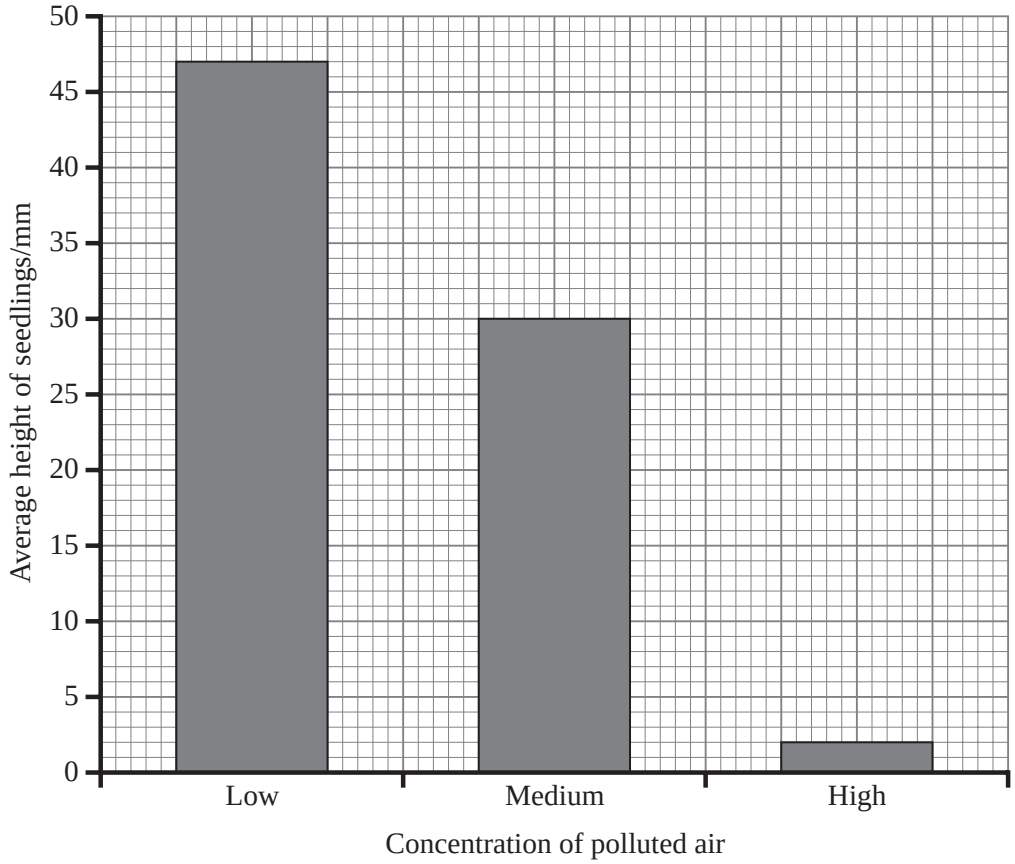
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_____

_____ [2]

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(b) The graph shows the average height of seedlings grown in different concentrations of polluted air.



(i) Give the average height of seedlings grown in the medium concentration of polluted air.

_____ mm [1]

(ii) How does increasing the concentration of polluted air affect the average height of seedlings?

_____

_____ [1]

(iii) Suggest **two** ways air pollution can be reduced.

_____

_____

_____ [2]

Examiner Only

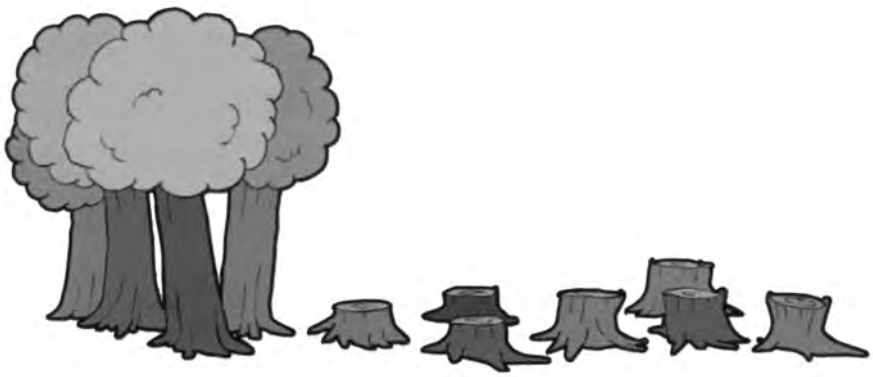
Marks	Remark

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(iv) Give **one** source of air pollution.

_____ [1]

The diagram shows the process of deforestation.



Source: www.edupics.com

(c) (i) What is deforestation?

_____ [1]

(ii) Give **two** advantages to the environment of reducing deforestation.

1. _____

_____ [1]

2. _____

_____ [1]

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Marks	Remark

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(d) The photographs show a grey and a red squirrel.

Grey Squirrel



© iStockphoto / Thinkstock

Red Squirrel



© iStockphoto / Thinkstock

There are now more of the larger grey squirrels (height 25–30 cm) in Ireland than the smaller red squirrels (height 19–23 cm). The red squirrels are hard to find as they spend a lot of their time in trees. At a weight of 300g red squirrels are half the weight of grey squirrels. Red squirrels also have large tufted ears and a longer bushy tail compared to the short and rounded tail of grey squirrels.

(i) Use the photographs and the passage to help complete the table comparing grey and red squirrels.

Feature	Grey Squirrel	Red Squirrel	
Height/cm			[1]
Weight/g			[2]
Tail			[1]

(ii) Suggest **one** reason why grey squirrels now outnumber red squirrels.

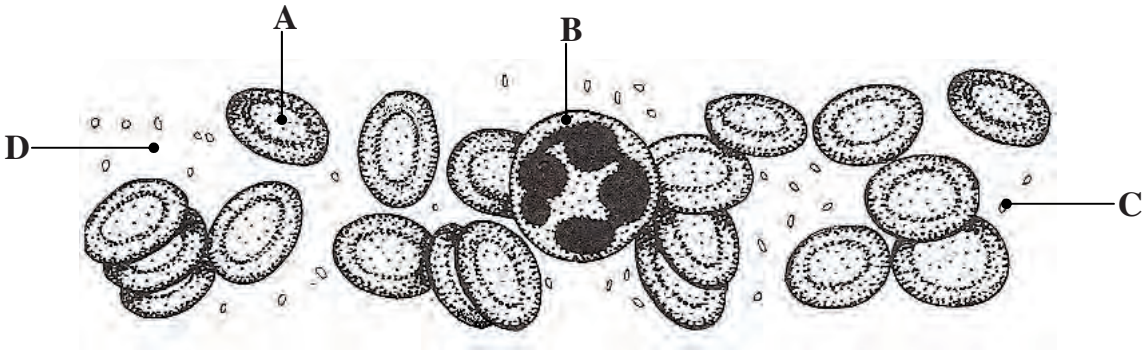
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_____ [1]

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Marks	Remark

2 The diagram shows a sample of blood.



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(a) (i) Name the parts A, B and C.

A _____ [1]

B _____ [1]

C _____ [1]

(ii) Use the diagram to find the ratio of cell type A to cell type B.

_____ [1]

Cell A contains haemoglobin.

(iii) What is the function of haemoglobin?

_____

_____ [1]

(iv) Give **two other** differences, shown in the diagram, between cells A and B.

_____

_____

_____ [2]

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Marks	Remark

The part of the blood sample labelled D is a pale yellow liquid.

Examiner Only	
Marks	Remark

(v) Name the pale yellow liquid D and give its function.

_____

_____

_____[2]

(vi) Which of the parts of the blood sample, A, B, C, or D is involved in clotting?

_____[1]

(vii) Explain why clotting is necessary.

_____

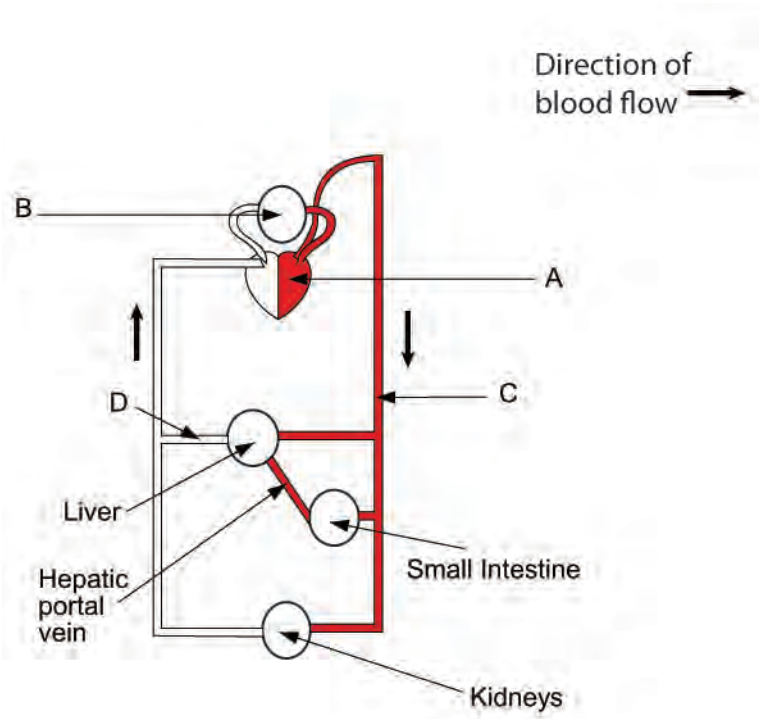
_____

_____

_____[2]

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The diagram shows part of the circulatory system.



© CCEA

(b) (i) Name organs A and B, artery C and vein D.

Organ A _____ [1]

Organ B _____ [1]

Artery C _____ [1]

Vein D _____ [1]

(ii) **Draw an arrow** on the hepatic portal vein to show the direction of blood flow. [1]

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Marks	Remark

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(c) Complete the table of blood vessels.

Type of blood vessel	Thickness of wall	Valves present	Speed of blood flow
Artery		No	
Vein	Thin		
Capillary	1 cell thick		Very slow

[5]

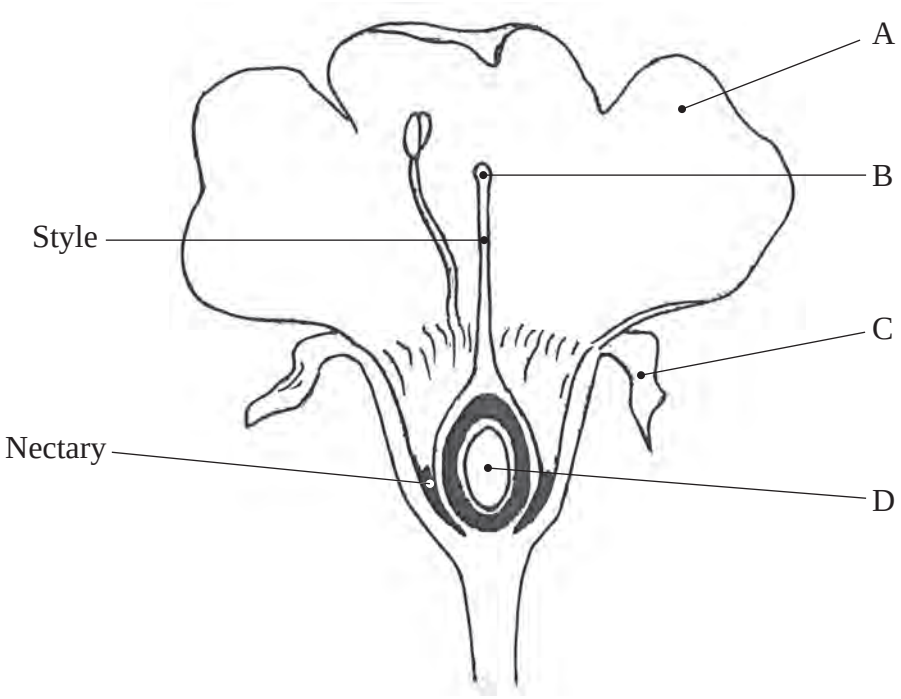
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Marks	Remark

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Examiner Only	
Marks	Remark

3 **(a)** The diagram shows part of an apple flower.



(i) Name parts A, B, C and D.

A _____ [1]

B _____ [1]

C _____ [1]

D _____ [1]

The stamens of an apple flower are just longer than the style.

(ii) **Draw a stamen** on the diagram. One has already been drawn for you. [2]

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Apple flowers are pollinated by insects.

(iii) What is pollination?

_____

_____

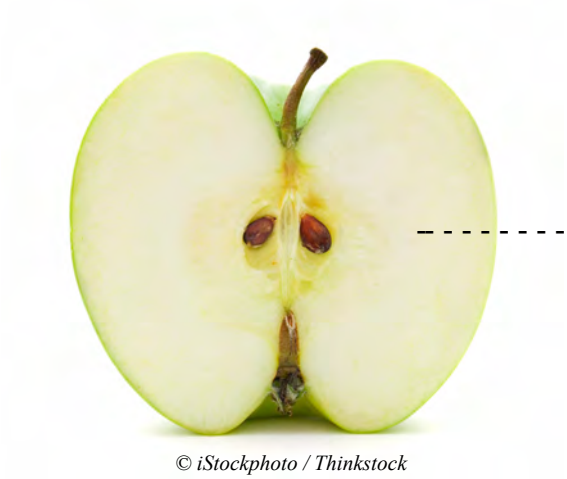
_____ [2]

(iv) Give **two** ways apple flowers are adapted for pollination by insects.

1. _____ [1]

2. _____ [1]

(b) The diagram shows half an apple.



© *iStockphoto / Thinkstock*

Food store

(i) **Use a line to label a seed** on the diagram. [1]

Apples are dispersed by animals.

(ii) Suggest **two** ways apples are adapted to attract animals.

1. _____

_____ [1]

2. _____

_____ [1]

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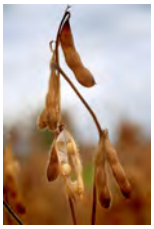
Marks	Remark

(iii) Suggest why the seed must have a tough outer coat.

_____

_____ [1]

(iv) Complete the table.

Example	Type of dispersal
Apple  © *iStockphoto / Thinkstock*	Animal
Creeping thistle  © *iStockphoto / Thinkstock*	
Vetch  © *Hemera / Thinkstock*	
Burdock  © *iStockphoto / Thinkstock*	

[1]

[1]

[1]

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Marks	Remark

(c) The apple was tested to find out whether it contained starch or sugars in the food store.

Examiner Only

Marks	Remark

(i) Name the reagent used to test for starch.

_____ [1]

(ii) Describe how you would test the apple for sugars.

_____

_____

_____ [2]

The table shows the colour of the reagent at the start and after testing with the apple.

Test for	Colour of reagent	
	start	**end**
Starch	Yellow/brown	Yellow/brown
Sugar	Blue	Brick red

(iii) Explain what these results show.

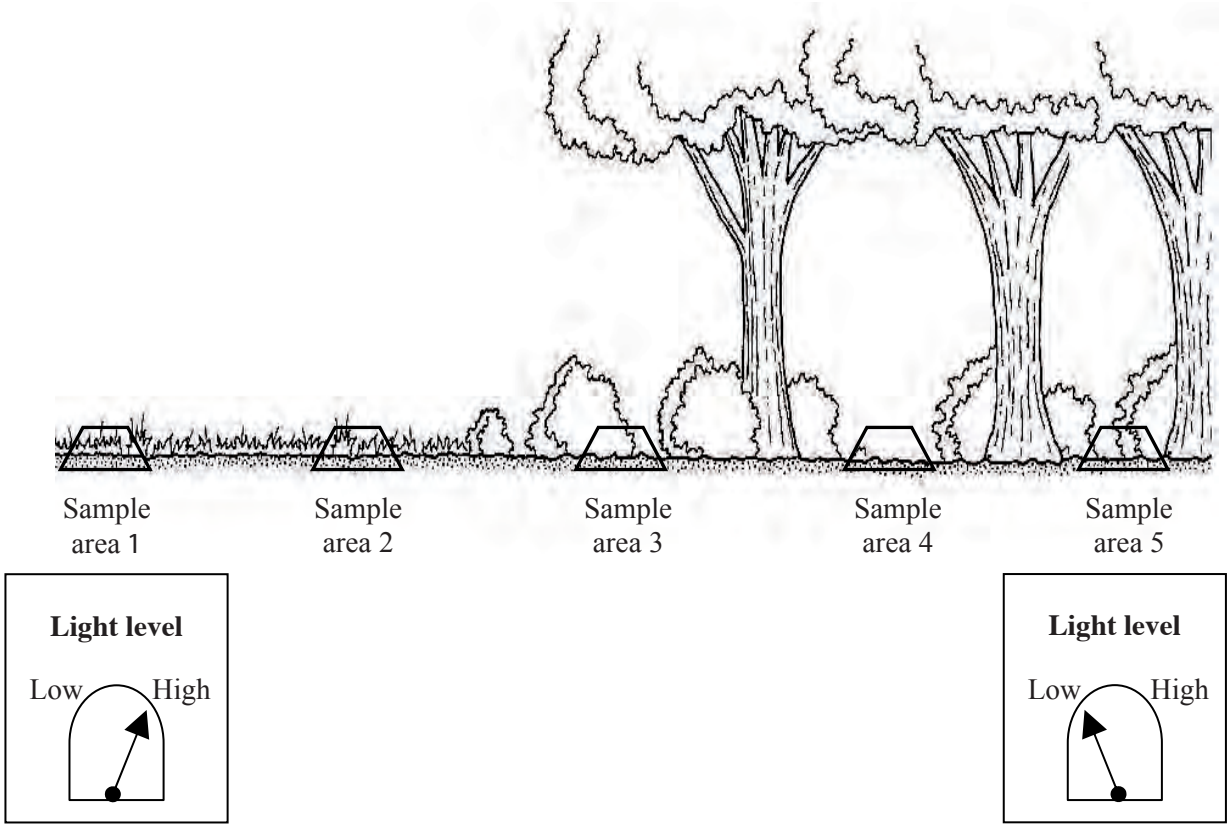
_____

_____

_____ [2]

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4 **(a)** The diagram shows where light measurements and samples were taken in a habitat study.



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Marks	Remark

The table shows the number of plant species in each sample area.

Sample area	1	2	3	4	5
Number of plant species	12	11	7	4	3

(i) Suggest why the number of plant species decreases from sample area 1 to sample area 5.

_____

_____ [1]

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(ii) Explain how light is used by plants.

_____

_____

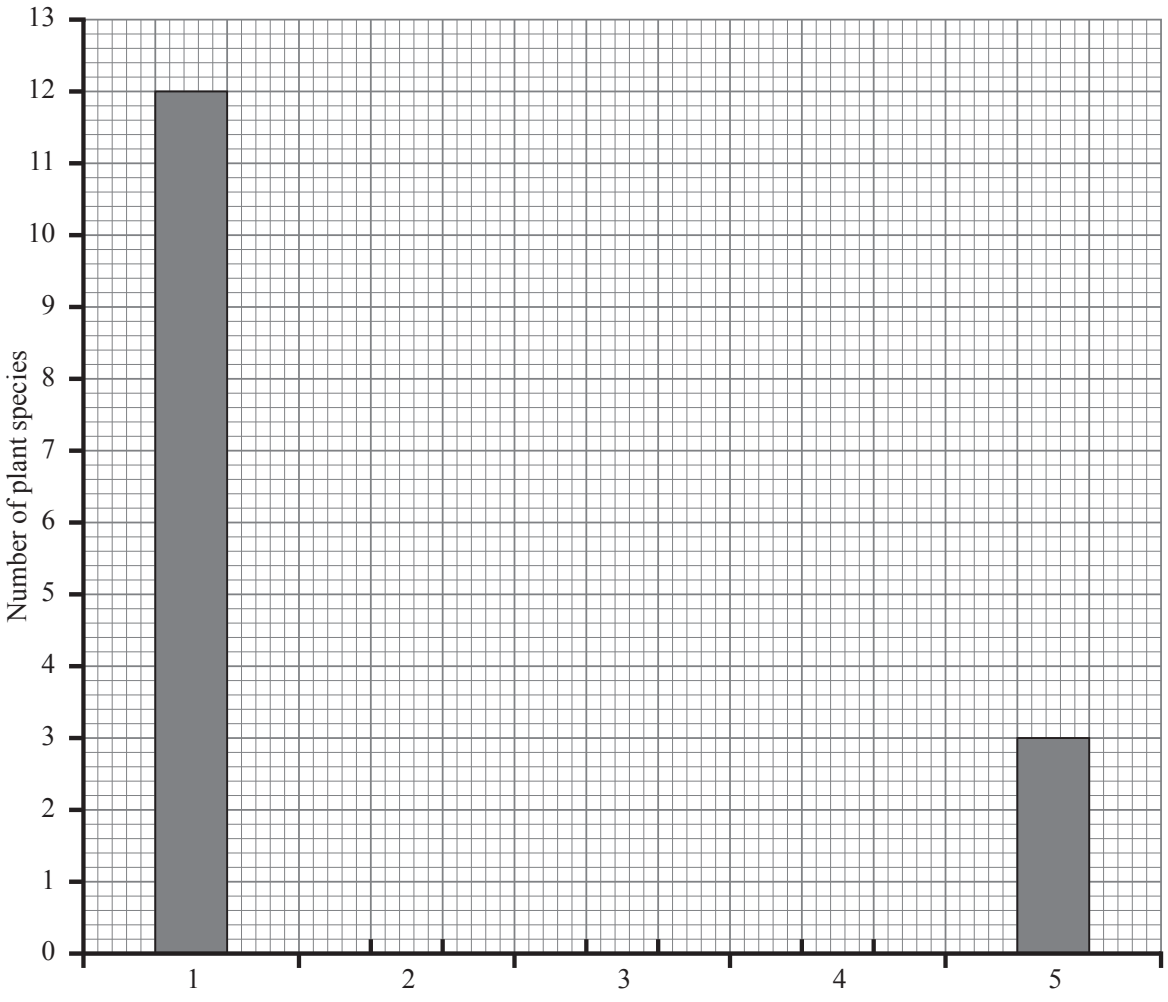
_____[2]

(iii) Give **two other** environmental factors which could affect the plants found.

1. _____[1]

2. _____[1]

(iv) Use the results table to label the axis of the graph and complete the bar graph.



[3]

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Marks	Remark

(b) The diagram shows a sample of the animals collected during the habitat study.



A – © iStockphoto / Thinkstock
B – © iStockphoto / Thinkstock
C – © Brand X Pictures / Thinkstock
D – © iStockphoto / Thinkstock E – © Hemera / Thinkstock

(i) Give the letters of the animals which are insects.

_____ [1]

(ii) Give **two** features of insects **not visible** in the diagram.

1. _____ [1]

2. _____ [1]

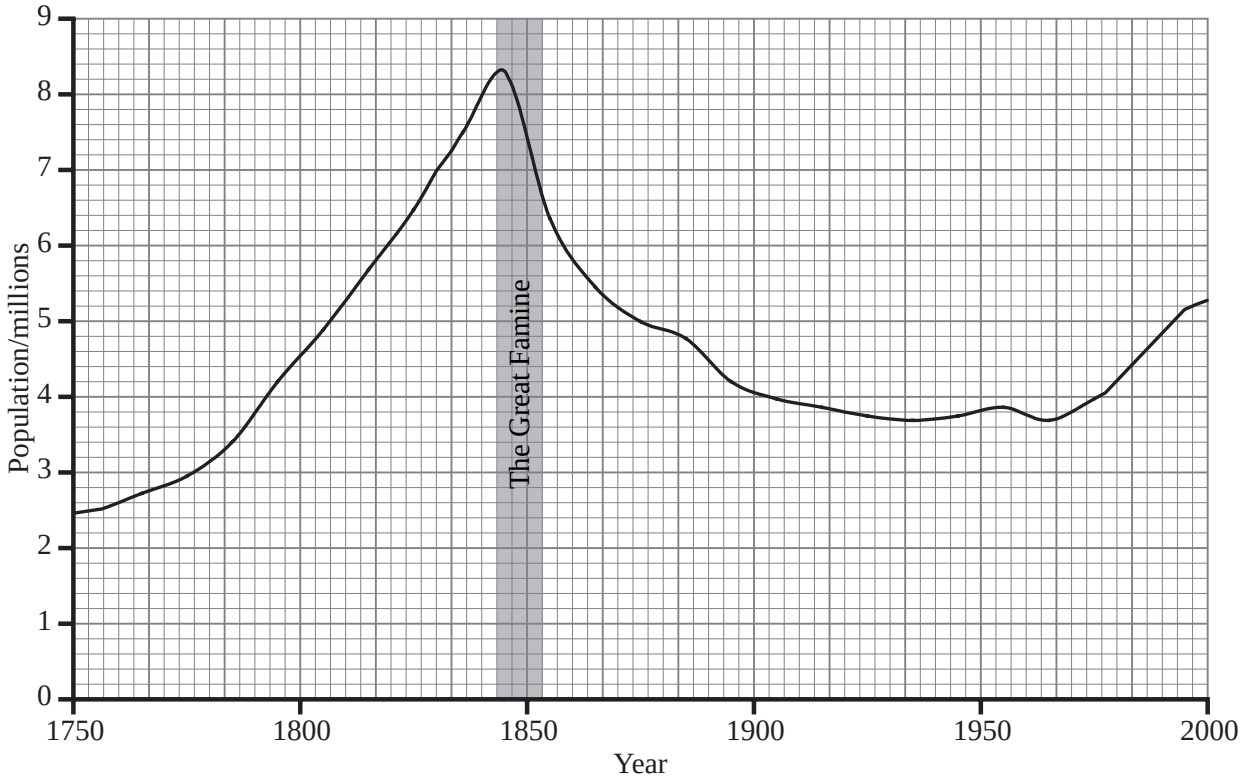
(iii) To which group do insects belong?

_____ [1]

(iv) Give **one** feature **visible** in the diagram, which adapts all of these animals for life on land.

_____ [1]

(c) The graph shows changes in the population of Ireland between 1750 and 2000.



© Dr Wesley Johnston

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Marks	Remark

(i) Explain, in terms of birth rate and death rate, the population change during the Great Famine.

_____

_____

_____[2]

After the Great Famine, the population decreased mainly due to emigration.

(ii) What is emigration?

_____

_____[1]

(iii) Suggest **two** reasons why the population started to increase after 1960.

1. _____[1]

2. _____[1]

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Examiner Only	
Marks	Remark

5 (a) (i) Complete the table on organ systems.

Organ systems	Function
Skeletal	
	Breaks down food for absorption
Circulatory	
	Controls and co-ordinates body functions

[1]

[1]

[1]

[1]

(ii) What is meant by an organ system?

_____

_____ [1]

The main function of the respiratory system is gas exchange.

(iii) Suggest why it is an advantage to take air in through the nose rather than the mouth.

_____

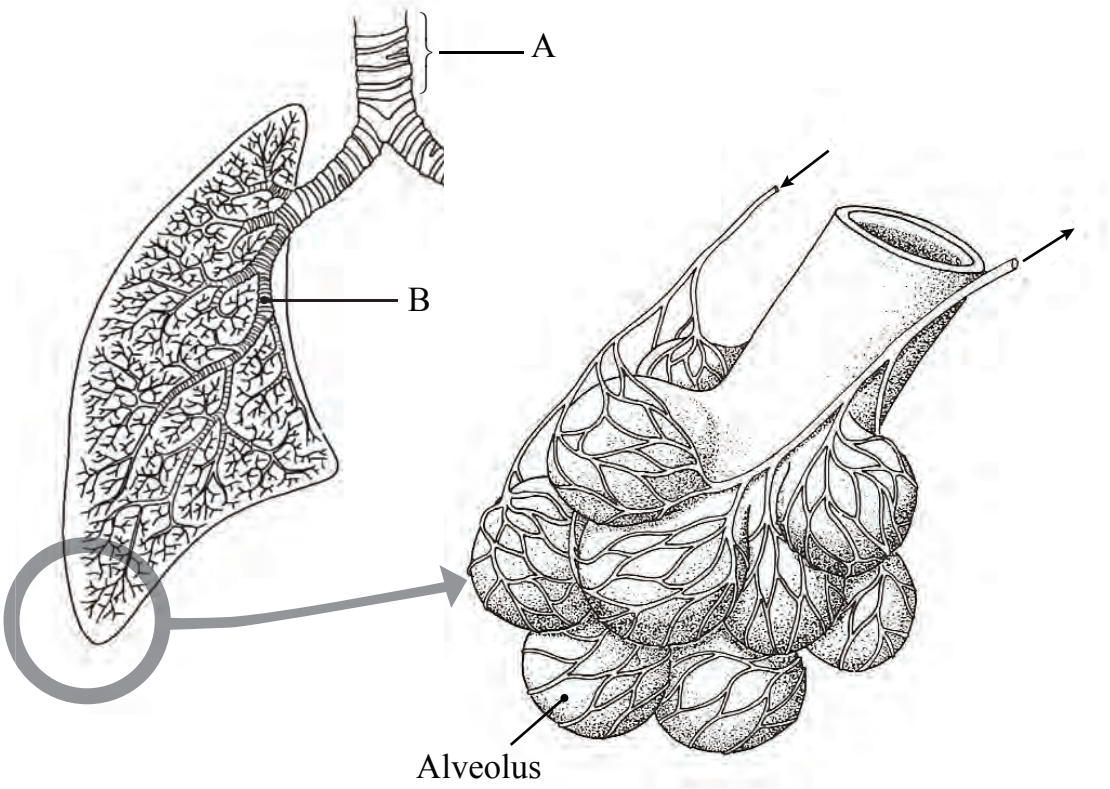
_____

_____

_____ [2]

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(b) The diagrams show part of the human respiratory system.



© *Introduction to Biology by D G Mackean, published by John Murray, 1978, ISBN 0719534496*

(i) Name parts A and B.

A _____ [1]

B _____ [1]

(ii) Describe how an alveolus is adapted for gas exchange.

_____

_____

_____

_____

_____

_____

_____

_____ [3]

Quality of written communication [2]

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Marks	Remark

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(c) Use this passage about smoking cigarettes to help answer the questions.

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Marks	Remark

In the UK about 120,000 people per year die of smoking-related diseases. 82% of all deaths from lung cancer, 83% of all deaths from bronchitis and emphysema and about 25% of all deaths from heart disease are linked to smoking.
People who smoke between 1 and 14 cigarettes a day have 8 times the risk of dying from lung cancer compared to non-smokers. The risk increases the more cigarettes are smoked; those who smoke over 25 cigarettes a day have 25 times this risk.
Many smokers would like to quit. Ten years after stopping smoking the risk of getting lung cancer has fallen to half that of a smoker and the risk of having a heart attack is the same as never having smoked.

(i) How many people die of smoking-related diseases each year?

_____ [1]

(ii) Complete the table. (Lines 2–4)

Cause of death	Percentage linked to smoking
Bronchitis and emphysema	
	25

[1]
[1]
[1]

(iii) Describe the difference in the risk of smoking 10 cigarettes per day compared to 30 cigarettes per day. (Lines 5–8)

_____

_____

_____ [2]

(iv) Which chemical in cigarette smoke can cause lung cancer?

_____ [1]

(v) Suggest why people who smoke cigarettes find it hard to stop.

_____ [1]

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Examiner Only	
Marks	Remark

6 **(a)** Complete the table on cell structure by placing a ✓ or an ✗ in the boxes.

✓ = present ✗ = absent

Cell structure	Plant cell	Animal cell
Cell wall	✓	
Cytoplasm		
Chloroplast		
Vacuole		✗

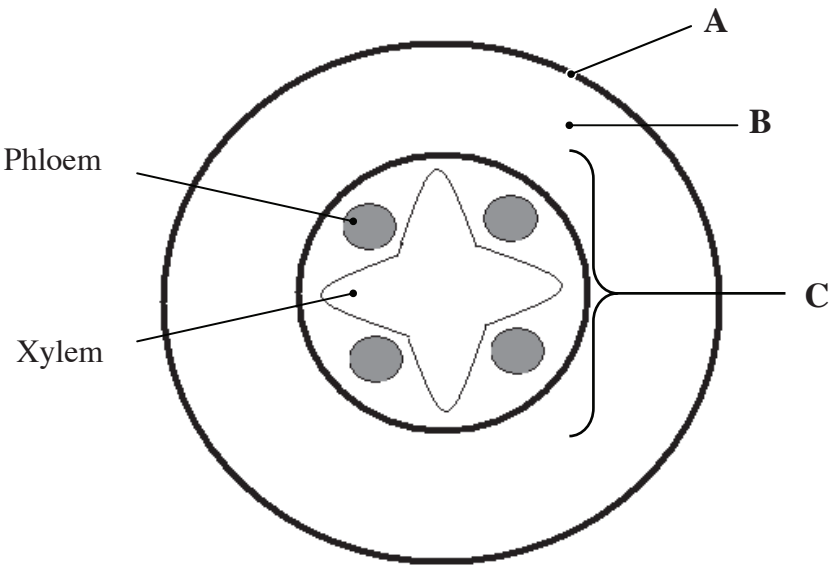
[1]

[1]

[1]

[1]

(b) The diagram shows a section through a plant root.



(i) Name parts A, B and C.

A _____ [1]

B _____ [1]

C _____ [1]

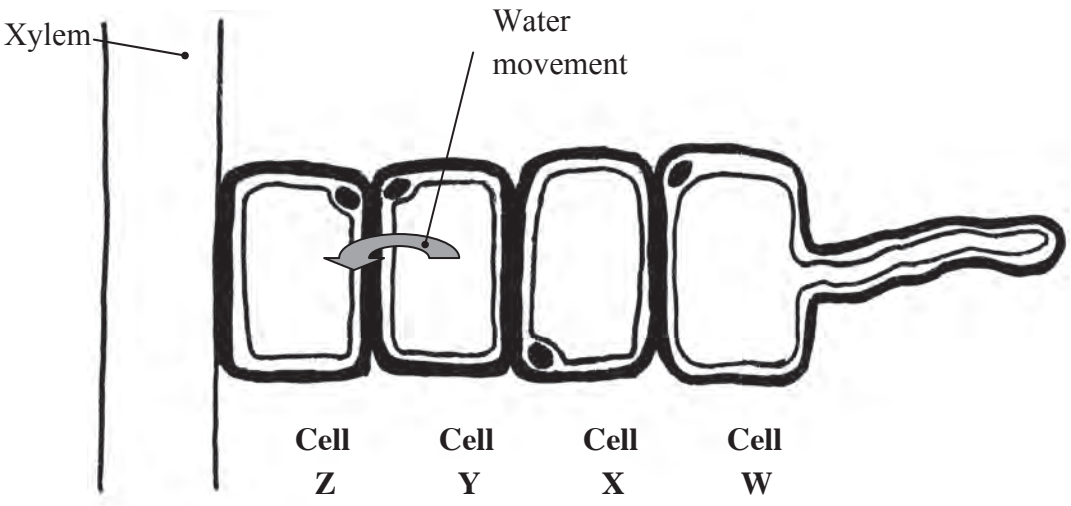
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(ii) Describe the function of phloem.

_____

_____ [2]

The diagram shows an enlarged section through part of the plant root.



(iii) On the diagram draw an arrow to show the direction water moves in the xylem. [1]

(iv) Give the name of this movement of water in the xylem.

_____ [1]

(v) Name the process by which water diffuses from cell Y to cell Z.

_____ [1]

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Marks	Remark

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(vi) Draw cell X enlarged three times.

[3]

(vii) Name cell W and describe how it is adapted for its function.

_____

_____

_____

_____

_____[3]

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Marks	Remark

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111051

Rewarding Learning

General Certificate of Secondary Education
2011

Science: Biology

Paper 2
Foundation Tier

[G0902]

THURSDAY 2 JUNE, MORNING

MARK SCHEME

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					AVAILABLE MARKS
1	**(a)**	**(i)**	14, 20, 66;	[2]	
		(ii)	Recycling;	[1]	
		(iii)	*Any **TWO** from:* Leaching/release of toxic chemicals; Sight/smell/described; Increased methane/CO_2/greenhouse gas; Using up more land;	[2]	
	(b)	**(i)**	30;	[1]	
		(ii)	Reduced/smaller/lower/shorter/decreases;	[1]	
		(iii)	*Any **TWO** from:* Burn less fossil fuels; Use alternative energy sources/described; Greater use of public transport/described; Catalytic convertors/chimney scrubbers; Lead free petrol; Reduce use of aerosols;	[2]	
		(iv)	**Burning** Fossil fuels/named example;	[1]	
	(c)	**(i)**	Cutting down (mature) trees;	[1]	
		(ii)	*Any **TWO** from:* Increased oxygen; Decreased carbon dioxide; Less soil erosion/reduces flooding; Fewer habitats lost;	[2]	
	(d)	**(i)**	Height: 25–30, 19–23; Weight: 600; 300; Tail: Short **and** rounded, Long **and** bushy;	[1] [2] [1]	
		(ii)	*Any **ONE** from:* Grey can eat/digest wider range of foods; Grey breed more often/have larger litters; Grey immune to/carries viral disease which kills red;	[1]	18

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						AVAILABLE MARKS
2	**(a)**	**(i)**	**A** – Red blood cell;		[1]	
			B – White blood cell;		[1]	
			C – Platelet;		[1]	
		(ii)	19:1;		[1]	
		(iii)	Transports oxygen;		[1]	
		(iv)	*Any **TWO** from:*			
			A no nucleus **and** nucleus in B;			
			A biconcave shape **and** B round shape;			
			A smaller/B larger;		[2]	
		(v)	Plasma;		[1]	
			transport;		[1]	
		(vi)	C/platelets;		[1]	
		(vii)	Stops blood loss;		[1]	
			Prevents infection/microorganism entering blood;		[1]	
	(b)	**(i)**	**A –** Heart;		[1]	
			B – Lung(s);		[1]	
			C – Aorta;		[1]	
			D – Hepatic vein;		[1]	
		(ii)	Arrow draw pointing towards the liver;		[1]	
	(c)		Thick; Fast/spurts;	[2]		
			Yes; Slow;	[2]		
			No;	[1]	[5]	22

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					AVAILABLE MARKS
3	(a)	(i)	**A** – petal;	[1]	
			B – stigma;	[1]	
			C – sepal;	[1]	
			D – ovule;	[1]	
		(ii)	Filament longer than top of stigma **and** starts in correct area;	[1]	
			anther on top of filament.	[1]	
		(iii)	Transfer of pollen from anther; to stigma;	[2]	
		(iv)	*Any* ***TWO*** *from*: ***Nectar***; brightly coloured ***petals***; scent; anther above stigma;	[2]	
	(b)	(i)	Seed labelled with line;	[1]	
		(ii)	Bright colour;	[1]	
			Sweet smell/taste;	[1]	
		(iii)	Prevent it being **digested**;	[1]	
		(iv)	Wind; self/explosive; animal;	[3]	
	(c)	(i)	Iodine;	[1]	
		(ii)	Boil; in Benedict's solution;	[2]	
		(iii)	Does not contain starch; but does contain sugar;	[2]	22

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					AVAILABLE MARKS
4	(a)	(i)	Less light;	[1]	
		(ii)	*Absorbed* by plant/as energy source/chlorophyll; [1] **(**During) photosynthesis/produce glucose/starch; [1]	[2]	
		(iii)	*Any* ***TWO*** *from*: Temperature; Water/drainage/rainfall/humidity; pH; Minerals/nitrates/fertilizer; CO_2; Wind exposure;	[2]	
		(iv)	*x*-axis label – Sample Areas Accurate plots (×2);	[1] [2]	
	(b)	(i)	A, C, D;	[1]	
		(ii)	*Any* ***TWO*** *from*: Wings; Body temperature not constant; Lay eggs; No backbone;	[2]	
		(iii)	Arthropods;	[1]	
		(iv)	Legs;	[1]	
	(c)	(i)	Death rate **higher/faster**; **than** birth rate;	[1] [1]	
		(ii)	People leaving Ireland/moving away from/moving out of (Ireland);	[1]	
		(iii)	*Any* ***TWO*** *from*: Improved food supply; Improved medical care/less disease; Improved sanitation/housing/standard of living; Increased immigration/birth rate/decreased death rate;	[2]	18

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					AVAILABLE MARKS
5	**(a)**	**(i)**	Support/protection/movement;	[1]	
			Digestive system;	[1]	
			Transport/explained;	[1]	
			Nervous;	[1]	
		(ii)	Group of **organs** working together;	[1]	
		(iii)	Air is warmed/moistened; Mucus traps dust/bacteria/air filtered (by hairs);	[2]	
	(b)	**(i)**	**A** – Trachea;	[1]	
			B – Bronchiole;	[1]	
		(ii)	*Any* ***THREE*** *from*: Large surface area; good blood supply; Thin; moist; good diffusion/concentration gradient; Permeable;	[3]	
			Quality of written communication	[2]	
	(c)	**(i)**	120,000	[1]	
		(ii)	83;	[1]	
			Heart disease;	[1]	
			Lung cancer; 82;	[1]	
		(iii)	10 cigarettes per day **8 times** risk of dying compared to non smokers; 30 per day have **25 times** the risk;	[2]	
		(iv)	Tar;	[1]	
		(v)	Addiction to nicotine;	[1]	22

						AVAILABLE MARKS
6	**(a)**	Cell wall	✓	✗	[1]	
		Cytoplasm	✓	✓	[1]	
		Chloroplast	✓	✗	[1]	
		Vacuole	✓	✗	[1]	
	(b)	**(i)** **A** – Epidermis;			[1]	
		B – Cortex;			[1]	
		C – Vascular bundle;			[1]	
		(ii) Transport; sucrose/sugar/products of photosynthesis/food;			[2]	
		(iii) Arrow pointing **up** in xylem;			[1]	
		(iv) Transpiration;			[1]	
		(v) Osmosis;			[1]	
		(vi) **Size** of cell; **shape**/size of vacuole; position of **nucleus**;			[3]	
		(vii) Root hair (cell); large surface area; to **absorb** water/minerals;			[3]	18
				Total		**120**

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GCSE

Science: Biology

Summer 2010

Mark Schemes

Issued: October 2010

Rewarding Learning

General Certificate of Secondary Education
2010

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Paper 2
Foundation Tier

[G0902]

THURSDAY 3 JUNE, MORNING

MARK SCHEME

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				AVAILABLE MARKS
1	**(a)**	Produce/release energy; Growth; Nutrition; Removing wastes;	[1] [1] [1] [1]	
	(b)	**(i)** Sperm duct;	[1]	
		(ii) Labelled line **X** on penis;	[1]	
		(iii) Labelled line **Y** on the scrotum;	[1]	
		(iv) To store urine; Sperm production;	[2]	
	(c)	**(i)** A – Petal; B – Style; C – Ovary; D – Sepal;	[4]	
		(ii) Attract insects;	[1]	
		(iii) Pollen from anthers; To stigma; Involves (male & female) gametes/pollen & ovule; Which fuse/fertilization/produce seeds;	[4]	18
2	**(a)**	**(i)** A – Eyepiece; B – Stage; C – Light source/lamp;	[3]	
		(ii) **Focus** image;	[1]	
		(iii) 10 × 4 = 40;	[2]	
		(iv) Structures more easily seen;	[1]	
		(v) Coverslip lowered over tissue;	[1]	

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				AVAILABLE MARKS
(b)	**(i)**	A – Nucleus; B – Cytoplasm; C – Vacuole;	[3]	
	(ii)	45;	[1]	
	(iii)	Large surface area; for absorption;	[2]	
	(iv)	Cell wall; Strength/support/shape;	[2]	
(c)	**(i)**	Tissue; Organ; Circulatory;	[3]	
	(ii)	Pump blood;	[1]	
	(iii)	Different/number of **organs**; doing same job/working together;	[2]	22
3	**(a)**	Any **two** from: Growth/repair; Energy/respiration; Protection against disease; Storage/insulation;	[2]	
	(b)	**(i)** Add **Benedicts**; **Heat** water in bath;	[2]	
		(ii) Orange/red;	[1]	
		(iii) Biuret; Blue; Purple/violet	[3]	
	(c)	**(i)** A – Flour; B – Yeast;	[2]	
		(ii) Multiply; Respire/ferment sugar;	[2]	
		(iii) Carbon dioxide;	[1]	
		(iv) Bubbles/gas **trapped**;	[1]	
		(v) Killed;	[1]	

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					AVAILABLE MARKS
	(d)	**(i)**	Peas; Water removed; Cornflakes; (Baked) beans; Refrigeration;	[5]	
		(ii)	Heat to 72°C; Cool **quickly**;	[2]	22
4	**(a)**	**(i)**	Sun;	[1]	
		(ii)	Leaves/grass;	[1]	
		(iii)	Leaves, thrush, hawk; Arrows;	[2]	
		(iv)	Breakdown; Release/recycle nutrients;	[2]	
		(v)	Feeding/energy level;	[1]	
		(vi)	Hawk;	[1]	
		(vii)	Hawk numbers will **increase**; more food/rabbits/thrush to eat;	[2]	
	(b)	**(i)**	Net;	[1]	
		(ii)	Bars drawn (×2) Line + Labels;	[3]	
	(c)	**(i)**	Any **two** from: Gills; Fins; Scaley skin;	[2]	
		(ii)	Reptiles and birds lay eggs with **shells**; Fish eggs are jelly-like/could dry out on land; or Gametes (egg/sperm) need water; or External fertilization;	[2]	18

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					AVAILABLE MARKS
5	(a)	(i)	Water; Oxygen; Glucose/starch;	[3]	
		(ii)	(Green area) contains chlorophyll; Which absorbs light;	[2]	
		(iii)	Any **three** from: Thin; Large surface area; Stomata (in lower epidermis)/air spaces (in spongy mesophyll); No chloroplasts in epidermis; Chloroplasts (concentrated/broadside) in mesophyll; Palisade cells end on; Xylem/phloem **short distance** from mesophyll;	[3]	
		(iv)	Diffuses through stomata;	[1]	
	(b)	(i)	Boil in water; Remove chlorophyll; Test/add iodine solution;	[3]	
		(ii)	Leaf dipped in water; To soften it;	[2]	
	(c)	(i)	Peripheral area without chlorophyll not shaded; Central part of covered strip not shaded and green area above and below shaded;	[2]	
		(ii)	**Dark**; For 48 hours;	[2]	18
6	(a)	(i)	A – Liver; B – Colon; C – Rectum;	[3]	
		(ii)	X on anus; Y on stomach;	[2]	
		(iii)	Any **two** from: Large surface area; Long; Thin lining; Folds; Villi; Microvilli; Permeable membrane; Many capillaries/good blood supply;	[2]	
		(iv)	Mechanical digestion/crush food/described; increase surface area/for enzyme action;	[2]	

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			AVAILABLE MARKS
(b)	**(i)**	A – Dentine; B – Pulp (cavity); [2]	
	(ii)	Harden **enamel**/plaque more easily **removed**; [1]	
	(iii)	Contains calcium; Needed for growth of teeth; [2]	
	(iv)	Any **three** from: Sugar forms plaque; Bacteria feed on sugar; Bacteria produce acid; Erodes **enamel**; [3] QWC [2]	
(c)	**(i)**	Food gets trapped in pocket/more difficult to clean/allows plaque to form; [1]	
	(ii)	Bone recedes; Tooth not anchored/becomes wobbly; [2]	22
		Total	**120**

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Summer 2009

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2009

Science: Biology

Paper 2
Foundation Tier

[G0902]

THURSDAY 28 MAY, MORNING

MARK SCHEME

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					AVAILABLE MARKS
1	(a)	(i)	Peat/lignite/oil/gas;	[1]	
		(ii)	Soot/smoke;	[1]	
		(iii)	Smokeless fuels/alternative fuels;	[1]	
		(iv)	Reduce light penetration/absorption/trapped; (reduced) photosynthesis/sugar/starch production; reduced growth; (Any **two**)	[2]	
		(v)	CO_2; CO; SO_2; NO_2; CH_4; any appropriate gas; (Any **two**)	[2]	
		(vi)	Causes learning difficulties/mental retardation in children;	[1]	
		(vii)	Reduces/declines/becomes smaller/lower;	[1]	
		(viii)	The greater the distance (from the city) the higher the number infected by blackspot;	[1]	
	(b)	(i)	1350 ÷ 3; 450;	[2]	
		(ii)	Waste food;	[1]	
		(iii)	Warmth/suitable temperature; Micro-organisms/microbes/fungi/bacteria; Compactness; Moisture; Neutral pH; (Any **one**)	[1]	
		(iv)	Glass; Metals; Cloth; Paper and card; (Any **two**)	[2]	
		(v)	Landfill; Incineration/burning;	[2]	18
2	(a)	(i)	A – lung; B – bronchus; C – diaphragm;	[3]	
		(ii)	Arrow out of alveolus/up bronchus/trachea/out of lungs;	[1]	
		(iii)	Correct position; correct size;	[2]	
		(iv)	Increased surface area; Short distance/easy for gas to pass through; Maintain diffusion gradient/carry gas away;	[3]	

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					AVAILABLE MARKS
		(v)	Contract; Moves up/out; Diaphragm;	[3]	
		(vi)	Volume increases; pressure decreases;	[2]	
	(b)	**(i)**	Red blood cells;	[1]	
		(ii)	No oxygen transported; respiration stops;	[2]	
		(iii)	Tar; nicotine;	[2]	
		(iv)	Passive smoking;	[1]	
		(v)	(Lung) cancer; bronchitis; emphysema; coronary heart disease; (Any **two**)	[2]	22
3	**(a)**	**(i)**	Breasts develop; body hair develops; menstruation;	[2]	
		(ii)	Sperm production; testosterone increases; penis enlarges; facial/body hair/voice breaks; (Any **two**)	[2]	
	(b)	**(i)**	Prevention of fertilization/pregnancy;	[1]	
		(ii)	Barrier/stops sperm entering uterus;	[1]	
		(iii)	Chemical; surgical; mechanical; surgical; mechanical;	[5]	
	(c)	**(i)**	Bars correctly drawn × 2; Labels;	[3]	
		(ii)	Vitamins; minerals; named	[2]	
		(iii)	Growth/repair;	[1]	
		(iv)	Antibodies in milk/defence against disease; Bonding; exact nutrients; (Any **two**)	[2]	
	(d)	**(i)**	Increases; then decreases;	[2]	
		(ii)	1994;	[1]	22

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					AVAILABLE MARKS
4	**(a)**	**(i)**	14;	[1]	
		(ii)	15 000;	[1]	
		(iii)	Males more **muscle**; (allow converse)	[1]	
		(iv)	Activity; (Not: Age/Gender)	[1]	
		(v)	Any **two** from: Below required energy; Starvation; Lose weight/tired;	[2]	
		(vi)	Respiration;	[1]	
		(vii)	CO_2/water;	[1]	
	(b)	**(i)**	24 – 16; 8;	[2]	
		(ii)	Heat loss; from around the sides of the boiling tube/tin can/to air/ converted to light/any example described; Pasta not burning completely; (Any **one**)	[1]	
	(c)	**(i)**	Low fat/low salt/low energy; (Accept values from table) High fibre;	[2]	
		(ii)	Source/storage of **energy**/insulation/protection;	[1]	
			To make haemoglobin; For red blood cells/O_2 transport;	[2]	
			For bones/teeth;	[1]	
		(iii)	Contains a full range of food molecules/groups in the required quantities;	[1]	18
5	**(a)**	**(i)**	Labelled chloroplast;	[1]	
		(ii)	Draw vacuole; cell wall drawn; Labels – vacuole; cell wall;	[4]	
		(iii)	Chloroplasts; to trap sunlight;	[2]	
		(iv)	Similarities: cytoplasm; nucleus; cell membrane; (Any **two**)	[2]	
			Differences: Vacuole; cell wall; chloroplasts; (Any **two**)	[2]	

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					AVAILABLE MARKS
	(b)	**(i)**	Root hair cell; Large surface area; to absorb water/minerals;	[3]	
		(ii)	Xylem;	[1]	
		(iii)	(Moves in) by osmosis; down a concentration gradient; through selectively permeable membrane; (Diffuses) from cell to cell; (Any **three**)	[3]	18
6	**(a)**	**(i)**	Animal with a backbone;	[1]	
		(ii)	Insulation/warmth; flight;	[2]	
		(iii)	Beak/claws/talons; catch/kill/hold/carry/tear prey; Eyes (forward facing); judge distance/pinpoint prey; (not 'see' UQ) Feathers/wings; silent/speedy flight; (any pair) (Any **two**: Feature + appropriate adaption)	[2]	
		(iv)	Internal fertilisation; lay <u>shelled</u> eggs/external development; One pair of wings (and one pair of legs); beak (if not given in **(iii)**); (Any **two**)	[2]	
	(b)	**(i)**	Arrow; Root vegetables at first trophic level; Owl at third trophic level;	[3]	
		(ii)	Grain/leaves/root vegetables;	[1]	
		(iii)	Second/primary consumer;	[1]	
		(iv)	Order and labels; Size of bars; Bars centred;	[3]	
	(c)	**(i)**	Chemical; used to kill/poison pests;	[2]	
		(ii)	Small amount of pesticides does not kill rat; Pesticide stays in rats; Pesticides become concentrated in owl; Pesticide reaches lethal level in owl; (Any **three**)	[3]	
			Quality of written communication	[2]	22
				Total	**120**

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