

New  
Specification



*Rewarding Learning*

**General Certificate of Secondary Education  
2012**

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**Biology**

Unit 1

Higher Tier

**[GBY12]**

**WEDNESDAY 30 MAY, AFTERNOON**

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**MARK  
SCHEME**

		AVAILABLE MARKS
1	(a) A – Palisade (mesophyll cell); B – Guard cell; C – Lower epidermis (cell);	[1] [1] [1]
	(b) Thin/clear/transparent/no pigment;	[1]
2	(a) Nerves carry <b>electrical</b> (impulses); Hormonal system uses <b>chemical</b> (messages);	[1] [1]
	(b) (i) The larger the diameter of the nerve, the higher/faster the speed (of conduction);	[1]
	(ii) Faster <b>response/reflex/reaction rate</b> (/time); <b>Reject:</b> "faster conduction rate" unqualified	[1]
3	(a) As age increases so does the amount of energy required; Boys require more energy than girls;	[2]
	(b) Increased weight/BMI/obesity; Increased risk of heart disease/heart attack/stroke/high blood pressure/ diabetes/arthritis;	[2]
	(c) More energy required for <b>growing/developing</b> embryo;	[1]
	(d) Genetics/inherited factors/alcohol/smoking/drugs;	[1]
		4
		4
		6

4 (a) **Indicative content:**

- 1 Dish B (/with more iodine) has a larger dark (blue/black) area than dish A;
- 2 Iodine turns starch blue/black colour;
- 3 Larger concentration of/more iodine in **B/5%**;
- 4 Iodine (diffuses) through the agar;
- 5 Increasing the concentration of iodine solution speeds up the rate of **diffusion**;
- 6 From region of high concentration to region of low concentration;

Response	Marks
Candidates must use appropriate specialist terms throughout to describe and explain the conclusions from the results using <b>at least 5</b> of the above points. They use good spelling, punctuation and grammar and the form and style are of a high standard.	[5]–[6]
Candidates use some appropriate specialist terms throughout to describe and explain the conclusions from the results using <b>at least 3</b> of the above points. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3]–[4]
Candidates make little use of specialist terms throughout to describe and explain the conclusions from the results using <b>at least 1</b> of the above points. The spelling, punctuation and grammar, form and style are of a <b>limited</b> standard.	[1]–[2]
Response not worthy of credit.	[0]

[6]

6

- 5 (a) (i) A – respiration; [1]  
 B – fossilisation; [1]  
 C – combustion; [1]
- (ii) Photosynthesis; [1]
- (b) (i)  $(22 \times 100) \div 100$ ; [2]  
 22%;
- (ii) Any **two** from:  
 (**In city**) more factories/more industrial;  
 More vehicles/cars etc;  
 More houses;  
 Less living organisms;  
**Accept:** converse in countryside [2]

8

		AVAILABLE MARKS
6	<p>(a) (Animal) cell which divides/clones/mitosis; Unspecialised/undifferentiated/later becomes specialised/described;</p>	[2]
	<p>(b) Any <b>two</b> from: Easier to <b>grow/culture</b>; Easier to extract/obtain/plentiful; Can develop into different cell types/tissues; <b>Accept:</b> converse for adult stem cells <b>Accept:</b> more in placenta/umbilical than in adult bone marrow</p>	[2]
	<p>(c) Any <b>three</b> from: Involves killing/destroying embryo/human life; Against their religion/playing God; Human rights of embryo; Other appropriate response;</p>	[3]
	<p>(d) Nervous; <b>Reject:</b> brain/brain tissue</p>	[1]
		8

- 7 (a) (i) A – bronchus; [1]  
B – diaphragm; [1]
- (ii) Ribs/intercostal muscles/pleural membranes; [1]
- (iii) **Pulling rubber** sheet/diaphragm/B **down**;  
(Belljar/thorax/chest/lung) volume increases or  
Pressure decreases; [2]
- (b) Any **two pairs** (*feature; appropriate adaptation;*) from:  
(Many) alveoli; Large surface area;  
Close to blood supply/surrounded by capillaries; Maintain (high) diffusion;  
Thin walls; short diffusion distance;  
Moist (lining); Allows gases to **dissolve**;  
Permeable (membranes); Allows gases to diffuse through;  
Ventilation; (maintain high) **diffusion** gradient; [4]
- (c) **Indicative content:**
- 1 Oxygen % reduced (in exhaled);
  - 2 Carbon dioxide % increased (in exhaled);
  - 3 More moisture/water vapour (exhaled);
  - 4 More heat/warmer (are exhaled);
  - 5 Respiration (in cells);
  - 6 In (body) cells; into blood;
  - 7 Transported in/diffused into blood/lungs;
- Reject:** reference to nitrogen

Response	Mark
Candidates must use appropriate specialist terms throughout to explain how named features of the respiratory system are adapted for gas exchange <b>using at least 5 of the above points</b> . They use <b>good</b> spelling, punctuation and grammar and the form and style are of a <b>high standard</b> .	[5]–[6]
Candidates use some appropriate specialist terms throughout to explain how named features of the respiratory system are adapted for gas exchange <b>using at least 3 of the above points</b> . They use <b>satisfactory</b> spelling, punctuation and grammar and the form and style are of a <b>satisfactory standard</b> .	[3]–[4]
Candidates make little use of specialist terms throughout to explain how named features of the respiratory system are adapted for gas exchange <b>using at least 1 of the above points</b> . The spelling, punctuation and grammar, form and style are of a <b>limited standard</b> .	[1]–[2]
Response not worthy of credit.	[0]

[6]

15

		AVAILABLE MARKS
8	(a) Villus;	[1]
	(b) A – lacteal; transports/absorbs fats;	[2]
	B – capillary; Transports/soluble (digested) food molecules/named example/ or maintains diffusion gradient;	[2]
	(c) One cell thick/short diffusion distance; <b>Accept:</b> microvilli; produces mucus;	[1]
9	(a) Z – Respiration;	[1]
	(b) Y – Primary consumer;	[1]
	(c) (i) = 3300; kJ;	[2]
	(ii) Energy passes to decomposers; Not all plant (cells/tissues) can be <b>digested/absorbed</b> by Y;	[1] [1]
	(d) Any <b>two</b> from: Only certain amount/limited amount of energy fixed by producers; Energy lost at each trophic level/step/stage; After 3 trophic levels 30 kJ left; Not enough energy/secondary consumers in the area to support another level/Tertiary consumers would have to eat many secondary consumers;	[2]
		6
		8

		AVAILABLE MARKS
10	(a) (i) Phototropism;	[1]
	(ii) Auxin;	[1]
	(b) <b>Sensitive to light:</b> B/C;	[1]
	Tip covered so no light hits tip;	[1]
	<b>Involves diffusion of plant hormone from tip;</b>	[1]
	D; Glass stops hormone moving down stem;	
	or B; no tip to produce hormone/no auxin/no response;	[1]
	(c) Light causes uneven distribution (of hormone);	[1]
	Hormone causes <b>cell</b> elongation;	[1]
	More (Cell) elongation/growth on dark side;	[1]
	(d) Any <b>two</b> from:	
	Dandelions have larger surface area;	
	(Dandelions) absorb <b>more</b> or <b>lethal</b> concentration of weedkiller;	
	Abnormal/excessive growth/respiration leading to death;	[2]
	(e) Less <b>competition</b> ;	
	For <b>named</b> resource/able to access more of a <b>named</b> resource;	[2]
	<b>Accept:</b> water/light/nutrient/space	
	(f) Any <b>two</b> from:	
	All fruit same/uniform size/fully developed;	
	Ripe at same time/harvested at same time;	
	Decreased harvesting costs/more profit;	[2]
11	(a) (Involves different) scientists <b>working together/in teams</b> ;	
	Sharing ideas/publishing results/research of past discoveries;	
	Different scientists did their own type of experiment/did further work;	[3]
	(b) Peer review/by other scientists <b>repeating</b> the work;	[1]
	Do <b>not</b> accept: Bunting and Best were supervised	
	(c) Presence of glucose in urine/lethargy/thirst/frequent urination;	[1]
	(d) Blood glucose concentration constantly <b>monitored</b> (by pancreas);	
	Change in concentration of insulin produced returns blood glucose concentration to normal;	[2]
	(e) Any <b>three</b> from:	
	Produced in the pancreas;	
	In response to <b>falling</b> blood glucose;	
	Acts in liver;	
	Causes glycogen to be converted to glucose;	
	which is released into the blood or increases glucose concentration;	[3]
		15
		10

- 12 (a) Any **three** from:  
**More** nitrates;  
 Eutrophication;  
 algae growth/plants grow;  
 Light blocked by suspended solids/shading;  
 Nutrients used up;  
 Therefore plants die [3]
- (b) 1 km; [1]
- (c) **Indicative content:**
- 1 Bacteria breakdown/decay/feed on sewage (suspended solids)
  - 2 Bacteria grows/increase when/are high in sewage (/suspended solids) released;
  - 3 Bacteria/respiration is anaerobic;
  - 4 (so) Dissolved oxygen falls between 1 and 2 km along river;
  - 5 Bloodworms can survive in low oxygen (anaerobic conditions)/ increased population in low oxygen;
  - 6 Bloodworms are indicator species/indicate polluted water;
  - 7 3 km all sewage solids decomposes therefore bacteria/ bloodworms decrease/O<sub>2</sub> rises;

Response	Mark
Candidates must use appropriate specialist terms throughout to explain the link between bacteria and bloodworms <b>using at least FIVE of the above points, in a logical sequence</b> . They use <b>good</b> spelling, punctuation and grammar and the form and style are of a <b>high standard</b> .	[5]–[6]
Candidates use some appropriate specialist terms throughout to explain the link between bacteria and bloodworms <b>using at least THREE of the above points, in a logical sequence</b> . They use <b>satisfactory</b> spelling, punctuation and grammar and the form and style are of a <b>satisfactory standard</b> .	[3]–[4]
Candidates make little use of specialist terms throughout to explain the link between bacteria and bloodworms <b>using at least ONE of the above points, in a limited sequence</b> . The spelling, punctuation and grammar, form and style are of a <b>limited standard</b> .	[1]–[2]
Response not worthy of credit.	[0]

[6]

**Total**AVAILABLE  
MARKS

10

**100**