



Rewarding Learning

**General Certificate of Secondary Education
2011–2012**

Science: Double Award (Modular)

**Living Organisms and the Processes of Life
End of Module Test**

Higher Tier

[GDA02]

TUESDAY 15 MAY 2012

9.15 am–10.00 am

**MARK
SCHEME**

		AVAILABLE MARKS
1	(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]
2	(a) Any three from: <i>Blockage</i> 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]
3	(a) Keep trachea open/prevent it from collapsing/support	[1]
	(b) Any two from: These are the <i>intercostal muscles</i> ; <i>Contract</i> during inspiration; so ribs move up or out; Increased volume/decreased pressure/lungs expand	[2]
	(c) (Blood) capillaries	[1]
4	(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
5	<p>(a) Any two from: Bacteria/microorganisms <i>caught in the mucus</i>; germs/dust particles Wafted by ciliated epithelial cells/moved by cilia/hairs; Swallowed; Killed by hydrochloric acid in stomach</p>	[2]
	<p>(b) Any four from: <i>Antigens</i> on surface of microorganism; stimulate the production of antibodies; by lymphocytes (special white blood cells); antibodies join with antigens/or bacteria/virus; forming a clump; This is ingested/digested; by the phagocytes/phagocytosis</p>	[4]
6	<p>(a) Pupil gets smaller/constricts/iris gets bigger; <i>to prevent damage</i> to the retina/eye</p>	[2]
	<p>(b) Reflex action/involuntary/automatic</p>	[1]
7	<p>(a) Urethra</p>	[1]
	<p>(b) Any two from: Breaks down excess <i>amino acids</i>/proteins; by deamination/removal of amino group; to produce <i>urea</i></p>	[2]
	<p>(c) Downwards arrow ↓</p>	[1]
8	<p>Any two from: Permanent solution/lifelong; Do not have to make frequent trips to the hospital/less time used up/ discomfort in dialysis; Don't have to be as careful about diet; Does not allow urea/wastes to build up in the body as they are toxic wastes/better general health/more efficient transplant → costs less</p>	[2]
9	<p>Description (one mark from Description) Dilates bronchioles/deeper breaths/Increases breathing rate;</p> <p>Explanation [3] Increases air flow to the lungs/volume increase; So more <i>oxygen</i> (enters blood); So more <i>respiration</i>/more <i>energy</i> released; for increased <i>muscle</i> (contraction)/<i>fight or flight</i></p>	[4]

		AVAILABLE MARKS
<p>10 (In the fast-flowing stream:) There is <i>more oxygen</i> dissolved in the water; so more <i>respiration/energy</i>; for <i>active uptake</i>/transport of the minerals; against a concentration gradient/or described low to high</p>	[4]	4
<p>11 (a) Respiration and photosynthesis occur; rate equal/CO_2 given out = CO_2 absorbed</p>	[2]	
<p>(b) Some other factor limits the rate of photosynthesis/temperature/ carbon dioxide/chlorophyll limits the rate/<i>light does not limit rate</i> water/minerals limit photosynthesis</p>	[1]	
<p>(c) Any two from: Farmyard manure contains minerals/nitrates/or named mineral/ or is a good fertiliser; tomatoes grow faster; larger leaf area; so increased photosynthesis OR Decomposition of farmyard manure releases carbon dioxide; so more carbon dioxide for photosynthesis</p>	[2]	5
<p>12 (a) Any three from: In Experiment 1, oxygen used up/CO_2 produced by blowfly is absorbed by NaOH; decrease in pressure/volume; the bead moves to the left; In Experiment 2, carbon dioxide (produced) is not absorbed; Carbon dioxide produced equals oxygen used</p>	[3]	
<p>(b) 65 mm^3 used in 5 minutes</p>	[1]	
<p>$780 \text{ mm}^3/2\text{g}/\text{hour}/65 \times 12 = 780 \text{ mm}^3/2\text{g}/\text{hour}$</p>	[1]	
<p>$= 390 \text{ mm}^3/\text{g}/\text{hour}$</p>	[1]	6
Total		50