

Version 1.0



**General Certificate of Education (A-level)  
June 2012**

**Biology**

**BIOL1**

**(Specification 2410)**

**Unit 1: Biology and Disease**

**Final**

***Mark Scheme***

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Mark Scheme – General Certificate of Education (A-level) Biology – Unit 1: Biology and Disease –  
June 2012

Question	Marking Guidelines	Mark	Comments
1(a)(i)	Golgi (apparatus/body);	1	
1(a)(ii)	<ol style="list-style-type: none"> <li>1. Nucleus;</li> <li>2. Mitochondrion;</li> <li>3. Endoplasmic reticulum/ER;</li> <li>4. Lysosome;</li> </ol>	2 max	<ol style="list-style-type: none"> <li>1. Accept: nucleolus/nuclear envelope/nuclear membranes</li> <li>2. Accept cristae/mitochondrial membranes</li> <li>3. Ignore reference to rough/smooth</li> <li>4. Reject lysozyme</li> </ol>
1(b)	(Aerobic) respiration/ATP production/provide energy;	1	<p>Accept Krebs cycle/ electron transport.</p> <p>Ignore 'produces energy'</p> <p>Reject anaerobic respiration</p> <p>Ignore what energy is used for</p>
1(c)	<ol style="list-style-type: none"> <li>1. High/ better resolution;</li> <li>2. Shorter wavelength;</li> <li>3. To see internal structures/ organelles/named organelles;</li> </ol>	2 max	<ol style="list-style-type: none"> <li>3. Accept ultrastructure</li> </ol>

Mark Scheme – General Certificate of Education (A-level) Biology – Unit 1: Biology and Disease –  
June 2012

Question	Marking Guidelines	Mark	Comments
2(a)	<ol style="list-style-type: none"> <li>(Risk) decreases, then increases;</li> <li>(Risk) increases from 2 (drinks per day);</li> </ol>	2	<ol style="list-style-type: none"> <li>Accept increases risk above 3</li> </ol>
2(b)	Age affects heart disease / age affects how alcohol affects the body;	1	Accept age affects results Accept 'removes confounding variable' Accept 'controlling a variable'
2(c)	<ol style="list-style-type: none"> <li>(True because) studies show decreased risk up to 3 drinks per day;</li> <li>(False because) eg all show an increased risk above 5 drinks / day, eg <b>A</b> and <b>B</b>, show increased risk (of heart disease) above 4 per day;</li> <li>Data only about heart disease/alcohol causes other diseases/social problems;</li> <li>Amount of alcohol per drink may vary;</li> <li>May be due to other factor</li> </ol>	<ol style="list-style-type: none"> <li>1</li> <li>2 max</li> </ol>	To gain 3 marks candidates must have mp1 and 2 from mps 2-5 <ol style="list-style-type: none"> <li>Accept any <u>evidence</u> from graph</li> <li>Accept any <u>evidence</u> from graph</li> </ol>

Mark Scheme – General Certificate of Education (A-level) Biology – Unit 1: Biology and Disease –  
June 2012

Question	Marking Guidelines	Mark	Comments
3(a)	1. Flatten/moves down; 2. (Diaphragm muscle) contracts;	2	1. Ignore: additional information about rib movements
3(b)	1. Diaphragm contracts/moves down/ flattens; 2. Increases volume (of thorax); 3. Decrease in pressure; 4. Air moves from high to lower pressure/down pressure gradient;	3 max	Ignore refs to rib movement  3. Accept pressure lower than atmospheric pressure 4. Reject: by diffusion
3(c)	1. Diffusion; 2. Across (alveoli)epithelium/ (capillary) endothelium;	2 max	Accept down diffusion gradient  2. Accept: capillary epithelium/squamous cell

Mark Scheme – General Certificate of Education (A-level) Biology – Unit 1: Biology and Disease –  
June 2012

Question	Marking Guidelines	Mark	Comments
4(a)	2 marks for correct answer 0.2;; 1 mark for 6/30;	2	Accept concentration ÷ time
4(b)	1. (Uptake) decreases/ slower, <u>then</u> no further uptake / uptake stops; 2. (Decreases) to 20 - 22/no uptake after 20/22 minutes;	2	2. Accept: (only) 1.6 (arbitrary units) absorbed / (only) drops to 8.4  Is for correct use of data from graph
4(c)	1. Stops/ reduces /inhibits respiration; 2. No/less energy released/ ATP produced; 3. (ATP/energy needed) for active transport;	3	1. Accept: inhibits respiratory enzymes 2. Ignore: less energy produced/ made 3. Accept ref to Na <sup>+</sup> pump/ description of active transport  Ignore consequences of less Na <sup>+</sup> in cell

Mark Scheme – General Certificate of Education (A-level) Biology – Unit 1: Biology and Disease –  
June 2012

Question	Marking Guidelines	Mark	Comments
5(a)	(Micro)organism that causes disease / harm to body / an immune response;	1	Accept: named microorganism that causes disease Allow infection
5(b)	<ol style="list-style-type: none"> <li>1. Phagocyte attracted by a substance/ recognises (foreign) antigen;</li> <li>2. (Pathogen)engulfed/ ingested;</li> <li>3. Enclosed in vacuole/ vesicle/ phagosome;</li> <li>4. (Vacuole) fuses/joins with lysosome;</li> <li>5. Lysosome contains enzymes;</li> <li>6. Pathogen digested/ molecules hydrolysed;</li> </ol>	4 max	<ol style="list-style-type: none"> <li>1. accept named substance eg chemical / antigen</li> <li>2. Accept: description</li> <li>5. Accept named example of enzyme</li> <li>6. Neutral: Destroyed</li> </ol>
5(c)	<ol style="list-style-type: none"> <li>1. Antigens (on pathogen) are a specific shape/ have specific tertiary / 3D structure;</li> <li>2. Antibody fits/binds / is complementary to antigen/ antibody-antigen complex forms;</li> </ol> <p><b>OR</b></p> <ol style="list-style-type: none"> <li>3. Antibodies are a specific shape / have specific tertiary/ 3D structure;</li> <li>4. Antigens (on pathogen) fit/ bind/ are complementary to antibody / antibody-antigen complex forms;</li> </ol>	2	1/3 Structure alone is insufficient  Reject – active site

Mark Scheme – General Certificate of Education (A-level) Biology – Unit 1: Biology and Disease –  
June 2012

Question	Marking Guidelines	Mark	Comments
6(a)	<ol style="list-style-type: none"> <li>1. Add Benedict's;</li> <li>2. Heat;</li> <li>3. Red/orange/yellow/green (shows reducing sugar present);</li> </ol>	3	<ol style="list-style-type: none"> <li>Hydrolyse with acid negates mp1</li> <li>2. Accept warm, but not an unqualified reference to water bath</li> <li>3. Accept brown</li> </ol>
6(b)(i)	<ol style="list-style-type: none"> <li>1. Starch hydrolysed / broken down / glucose/maltose produced;</li> <li>2. Lower water potential;</li> <li>3. Water enters by osmosis;</li> </ol>	3	<ol style="list-style-type: none"> <li>1. Neutral: Sugar produced</li> </ol>
6(b)(ii)	Only 2 pHs studied/ more pHs need to be tested;	1	Accept: different amylase may have a different optimum pH



Mark Scheme – General Certificate of Education (A-level) Biology – Unit 1: Biology and Disease –  
June 2012

Question	Marking Guidelines	Mark	Comments
7(a)	Hydrolysis (reaction);	1	Accept phonetic spelling
7(b)	<ol style="list-style-type: none"> <li>1. Too big/ wrong shape;</li> <li>2. To fit/ bind/ pass through (membrane/ into cell/through carrier/ channel protein);</li> <li>3. Carrier / channel protein;</li> </ol>	3	<ol style="list-style-type: none"> <li>1. Wrong charge – neutral Accept insoluble</li> <li>3. Accept carrier/ channel protein not present</li> </ol>
7(c)	<ol style="list-style-type: none"> <li>1. Villi /microvilli damaged/ destroyed;</li> <li>2. Reduced surface area ;</li> <li>3. For (facilitated) diffusion/ active transport;</li> </ol>	3	<ol style="list-style-type: none"> <li>2. Accept fewer channel/ carrier proteins</li> <li>3. Must be in correct context</li> </ol>
7(d)	Foreign/(act as) antigen /non-self;	1	Reject foreign cells
7(e)	<ol style="list-style-type: none"> <li>1. Dose to be given;</li> <li>2. No (serious) side effects;</li> <li>3. How effective;</li> <li>4. Cost of drug;</li> </ol>	2 max	Accept: interaction with other drugs

Mark Scheme – General Certificate of Education (A-level) Biology – Unit 1: Biology and Disease –  
June 2012

Question	Marking Guidelines	Mark	Comments
8(a)	<ol style="list-style-type: none"> <li>1. SAN → AVN → bundle of His /Purkyne fibres;</li> <li>2. Impulses / electrical activity (over atria);</li> <li>3. Atria contract;</li> <li>4. Non-conducting tissue (between atria and ventricles);</li> <li>5. Delay (at AVN) ensures atria empty/ ventricles fill before ventricles contract;</li> <li>6. Ventricles contract from apex upwards;</li> </ol>	5 max	1. Mark for correct sequence
8(b)	<ol style="list-style-type: none"> <li>1. Too much saturated fat/ cholesterol in diet;</li> <li>2. Increase in LDL/ cholesterol in blood;</li> <li>3. Atheroma/ fatty deposits/ plaques in artery walls;</li> <li>4. Reduces diameter of / blocks <u>coronary</u> arteries;</li> <li>5. Less oxygen/ glucose to heart muscle /tissue/ cells;</li> <li>6. Increase in blood pressure;</li> <li>7. (Increased risk of )clot / thrombosis / embolism/ aneurysm;</li> </ol>	5 max	<p>1. Accept: Too much salt / alcohol</p> <p>Marking points 6 and 7 can be awarded in the context of salt</p>