General Certificate of Education (A-level)
June 2012

Biology BIOL1

(Specification 2410)

Unit 1: Biology and Disease

Final

Mark Scheme

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Question	Marking Guidelines	Mark	Comments
1(a)(i)	Golgi (apparatus/body);	1	
1(a)(ii)	1. Nucleus; 2. Mitochondrion; 3. Endoplasmic reticulum/ER; 4. Lysosome;	2 max	1. Accept: nucleolus/nuclear envelope/nuclear membranes 2. Accept cristae/mitochondrial membranes 3. Ignore reference to rough/ smooth 4. Reject lysozyme
1(b)	(Aerobic) respiration/ATP production/provide energy;	1	Accept Krebs cycle/ electron transport. Ignore 'produces energy' Reject anaerobic respiration Ignore what energy is used for
1(c)	1. High/ better resolution; 2. Shorter wavelength; 3. To see internal structures/ organelles/named organelles;	2 max	3. Accept ultrastructure

Question	Marking Guidelines	Mark	Comments
2(a)	1. (Risk) decreases, then increases; 2. (Risk) increases from 2 (drinks per day);	2	2. Accept increases risk above 3
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)	1. (True because) studies show decreased risk up to 3 drinks per day; 2. (False because) eg all show an increased risk above 5 drinks / day, eg **A** and **B**, show increased risk (of heart disease) above 4 per day; 3. Data only about heart disease/alcohol causes other diseases/social problems; 4. Amount of alcohol per drink may vary; 5. May be due to other factor	1 2 max	To gain 3 marks candidates must have mp1 and 2 from mps 2-5 1. Accept any <u>evidence</u> from graph 2. Accept any <u>evidence</u> from graph

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

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^+ pump/ description of active transport Ignore consequences of less Na^+ in cell

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)	1. Phagocyte attracted by a substance/ recognises (foreign) antigen; 2. (Pathogen)engulfed/ ingested; 3. Enclosed in vacuole/ vesicle/ phagosome; 4. (Vacuole) fuses/joins with lysosome; 5. Lysosome contains enzymes; 6. Pathogen digested/ molecules hydrolysed;	4 max	1. accept named substance eg chemical / antigen 2. Accept: description 5. Accept named example of enzyme 6. Neutral: Destroyed
5(c)	1. Antigens (on pathogen) are a specific shape/ have specific tertiary / 3D structure; 2. Antibody fits/binds / is complementary to antigen/ antibody-antigen complex forms; ***OR*** 3. Antibodies are a specific shape / have specific tertiary/ 3D structure; 4. Antigens (on pathogen) fit/ bind/ are complementary to antibody / antibody-antigen complex forms;	2	1/3 Structure alone is insufficient Reject – active site

Question	Marking Guidelines	Mark	Comments
6(a)	1. Add Benedict's; 2. Heat; 3. Red/orange/yellow/green (shows reducing sugar present);	3	Hydrolyse with acid negates mp1 2. Accept warm, but not an unqualified reference to water bath 3. Accept brown
6(b)(i)	1. Starch hydrolysed / broken down / glucose/maltose produced; 2. Lower water potential; 3. Water enters by osmosis;	3	1. Neutral: Sugar produced
6(b)(ii)	Only 2 pHs studied/ more pHs need to be tested;	1	Accept: different amylase may have a different optimum pH

Question	Marking Guidelines	Mark	Comments
7(a)	Hydrolysis (reaction);	1	Accept phonetic spelling
7(b)	1. Too big/ wrong shape; 2. To fit/ bind/ pass through (membrane/ into cell/through carrier/ channel protein); 3. Carrier / channel protein;	3	1. Wrong charge – neutral Accept insoluble 3. Accept carrier/ channel protein not present
7(c)	1. Villi /microvilli damaged/ destroyed; 2. Reduced surface area ; 3. For (facilitated) diffusion/ active transport;	3	2. Accept fewer channel/ carrier proteins 3. Must be in correct context
7(d)	Foreign/(act as) antigen /non-self;	1	Reject foreign cells
7(e)	1. Dose to be given; 2. No (serious) side effects; 3. How effective; 4. Cost of drug;	2 max	Accept: interaction with other drugs

Question	Marking Guidelines	Mark	Comments
8(a)	1. SAN → AVN → bundle of His /Purkyne fibres; 2. Impulses / electrical activity (over atria); 3. Atria contract; 4. Non-conducting tissue (between atria and ventricles); 5. Delay (at AVN) ensures atria empty/ ventricles fill before ventricles contract; 6. Ventricles contract from apex upwards;	5 max	1. Mark for correct sequence
8(b)	1. Too much saturated fat/ cholesterol in diet; 2. Increase in LDL/ cholesterol in blood; 3. Atheroma/ fatty deposits/ plaques in artery walls; 4. Reduces diameter of / blocks coronary arteries; 5. Less oxygen/ glucose to heart muscle /tissue/ cells; 6. Increase in blood pressure; 7. (Increased risk of)clot / thrombosis / embolism/ aneurysm;	5 max	1. Accept: Too much salt / alcohol Marking points 6 and 7 can be awarded in the context of salt