Biological Molecules

Mark Scheme 2

Level	IGCSE(9-1)
Subject	Biology
Exam Board	Edexcel IGCSE
Module	Double Award (Paper 1B)
Topic	Structure and Functions in Living Organisms
Sub-Topic	Biological Molecules
Booklet	Mark Scheme 2

Time Allowed: **78 minutes**

Score: **/65**

Percentage: **/100**

Grade Boundaries:

9	8	7	6	5	4	3	2	1
>90%	80%	70%	60%	50%	40%	30%	20%	10%

Question number	Answer	Notes	Marks
1 (a) (i)	respiration / energy;		1
(ii)	active transport / active uptake; low to high conc. / against conc. gradient / eq;	ignore across concentration gradient	2
(iii)	chlorophyll / chloroplasts; photosynthesis / absorb light / eq;		2
(b)	1. variation (in Ash borers) / eq; 2. mutation / mutate(s) / mutated; 3. not eaten / not attacked / avoided / eq; 4. survive(s) / survival /survived; 5. reproduce / breed / mated / multiply / eq; 6. pass on gene(s) / allele(s) / eq; 7. process continues over time / eq;		Max 4

Total 9 marks

Question number	Answer	Marks
2 (a) (i)	pork;	1
(ii)	210;; allow one mark for 21 however expressed	2
(b)	pork;	1
(c)	energy; Ignore food store protection / padding / eq; insulation / prevent heat loss / keep warm / eq; cell membranes; myelin sheath;	Max 2
(d)	Iron / Fe; R ion	1

Total 7 Marks

<table>
<tr><th>Question number</th><th>Answer</th><th>Marks</th></tr>
<tr><td>3 (a)</td><td>C H O only / carbon, hydrogen and oxygen only;</td><td>1</td></tr>
<tr><td>(b)</td><td>
<table>
<tr><td>Carbohydrate</td><td>Soluble</td><td>Found in animal cells</td><td>Broken down by amylase</td><td>Small molecule</td><td>Absorbed in the stomach</td></tr>
<tr><td>Starch</td><td>X</td><td>X</td><td>√</td><td>X</td><td>X</td></tr>
<tr><td>Glucose</td><td>√;</td><td>√;</td><td>X</td><td>√;</td><td>X</td></tr>
</table>
A tick cross = zero</td><td>5</td></tr>
<tr><td>(c) (i)</td><td>Benedicts / eq;
heat / water bath;
red / orange / yellow / green / eq;</td><td>3</td></tr>
<tr><td>(ii)</td><td>water bath / avoid direct heat / point away / eq;
goggles / lab coat / tongs / tie hair / tuck tie away / gloves;</td><td>2</td></tr>
</table>

Total 11 Marks

Question number	Answer	Notes	Marks
4 (a)	grass;		1
(b) (i)	1600;;	allow one mark for 96 000 or 1.6 or ÷ 60 in working	2
(ii)	1. anaerobic (respiration);		
	2. less oxygen;	ignore oxygen debt	
	3. lactic acid / low pH;		
	4. affects enzymes / denatures enzymes;	ignore muscle fatigue / cramp / pain	
	5. less energy / less ATP;		Max 3

(c)	1. variation / variety; 2. mutation mutates; 3. survive / survival / survival of the fittest; 4. reproduction / breed / mate /produce offspring; 5. pass on gene / DNA / allele;	allow converse 3. gnore several generations / increase in number 4. gnore pass on mutation unless defined / characteristic	Max 4

(d)(i)	light passes through retina twice / retina again / more light through retina / more detection by retina / more stimulation of retina / more retina cells stimulated / reflects back through retina / eq;		1
(ii)	large(r) pupil / dilated pupil / expanded pupil / <u>more</u> rods / larger hole in iris / radial muscles contract more / eq;	ignore more cones ignore smaller iris ignore circular muscles relax	1
(e)(i)	1. lion eats <u>protein</u> / meat is <u>protein</u>; 2. amylase cannot digest <u>protein</u>;	1. allow lion does not eat <u>starch</u> / meat has no <u>starch</u> 2. low amylase digests <u>starch</u>	2
(ii)	1. increase surface area / increase surface area to volume ratio; 2. <u>protease</u> / <u>pepsin</u>;	ignore enzyme	2

Question number	Answer	Notes	Marks
5 (a)	C;	Ignore ureter	1
(b))	1. (protein molecules are) large / too big / eq;	Accept converse linked to small molecules	2
	2. leave glomerulus / leave capillaries / enter Bowman's / enter renal capsule / eq;	Ignore if into glomerulus	
(ii)	1. reabsorbed / (absorbed) back into blood;	Ignore other named parts of nephron	2 max
	2. proximal / first (convoluted) tubule / eq;		
	3. active transport / active uptake / against concentration gradient / eq;		
(iii)	1. urea;		2
	2. minerals / ions / salts / named mineral ion / hormones / vitamins;		
(c)	1. no insulin / not enough insulin;		max 2
	2. high blood glucose levels;		
	3. cannot reabsorb (all) glucose;		

(d)	1. (more) ADH; 2. increased permeability; 3. collecting duct; 4. (re)absorption of water;		3 max

Total 12 marks

<table>
<tr><th>Question number</th><th>Answer</th><th>Notes</th><th>Marks</th></tr>
<tr><td>6 (a)</td><td>
<table>
<tr><th>name of process</th><th>description of process</th></tr>
<tr><td><u>ingestion</u>;</td><td>food enters the mouth</td></tr>
<tr><td>digestion</td><td>break down <u>large</u> molecules / large molecules to small molecules / insoluble to soluble molecules;</td></tr>
<tr><td><u>absorption</u>;</td><td>small molecules move from small intestine into the blood</td></tr>
<tr><td><u>assimilation / synthesis</u>;</td><td>small food molecules are used to build large molecules</td></tr>
<tr><td>egestion</td><td>removal of undigested food / faeces / waste <u>from anus</u>;</td></tr>
</table>
</td><td></td><td>5</td></tr>
<tr><td>(b)</td><td>1. mylase;
2. starch;
3. maltose / glucose;
4. physical digestion / mechanical digestion / chewing eq;</td><td>ignore carbohydrase</td><td>3</td></tr>
<tr><td>(c)</td><td>(yes) A is starch;
B is glucose;</td><td>max 1 if A starch and B glucose but say no one is starch and one is glucose =1 mark</td><td>2</td></tr>
</table>

(Total for Question 1= 10 marks)