

Biological Molecules

Mark Scheme 1

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 1

Time Allowed: 76 minutes

Score: /63

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)	A; (C) B; A;	Only one letter in each box	3
(ii)	1. (bile) <u>emulsification</u> / <u>emulsifies</u> ; 2. small(er) drops / increased surface area / more drops; 3. optimum pH / correct pH / best pH; 4. (lipase) is an enzyme; 5. digestion / breakdown; 6. into <u>fatty acids</u> / into <u>glycerol</u> ;		4
(b)(i)	villus / villi;	allow phonetic spelling	1

(ii)	1. large surface area; 2. microvilli ; 3. capillaries; 4. movement of blood / concentration gradient / eq; 5. one cell thick / thin wall / thin / short distance; 6. diffusion; 7. active transport;	1. ignore many villi idea 4. ignore cell wall	5
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Total 13 marks

Question number	Answer	Notes	Marks
2(a) (i)	safety glasses / wear gloves ;	Ignore lab coat / tie hair back / eq	1
	(ii)	11/ eleven;	1
(b) (i)	remove starch / solution from surface of syringe / eq;	Ignore get into syringe	1
	(ii)	mix <u>contents</u> / mix <u>amylase and starch</u> / eq;	1
	(iii)	keep at correct temperature / keep temperature constant / eq;	1
		Ignore fair test	

(c)	(i)	1. volume / concentration of amylase; 2. volume / concentration of starch; 3. volume / concentration of iodine / drops of iodine; 4. volume / concentration of mixture;	Allow amount only once	2
	(ii)	temperature;	Ignore time	1
(d)		1. 6 minutes / between 5 and 6 minutes / eq; 2. iodine stays yellow / orange / brown / iodine stays same colour / colourless / not blue black; 3. no starch present; 4. digested/broken down ;	Reject 6-7 mins	3

Question number	Answer	Notes	Marks
(e)(i)	1. fewer wells with blue black colour / more wells yellow / orange / brown / colourless / eq; 2. starch digested sooner / quicker / reaction completed sooner / eq;		2
(ii)	1. enzymes work faster at 40°C / ref to optimum / eq; 2. more (kinetic) energy / molecules move faster / eq; 3. more collisions / more enzyme substrate complexes /eq;	Ignore ref to denature	2

Total 15 marks

Question number	Answer	Notes	Marks												
3 (a)	<table border="1" data-bbox="548 411 1377 962"> <thead> <tr> <th data-bbox="548 411 817 592">Large food molecule</th> <th data-bbox="822 411 1090 592">Enzyme involved in digestion</th> <th data-bbox="1095 411 1377 592">Small food molecule produced</th> </tr> </thead> <tbody> <tr> <td data-bbox="548 595 817 703">starch</td> <td data-bbox="822 595 1090 703">amylase</td> <td data-bbox="1095 595 1377 703">glucose / maltose;</td> </tr> <tr> <td data-bbox="548 707 817 847">protein;</td> <td data-bbox="822 707 1090 847">protease</td> <td data-bbox="1095 707 1377 847">amino acids / polypeptides / peptides;</td> </tr> <tr> <td data-bbox="548 850 817 962">lipid</td> <td data-bbox="822 850 1090 962">lipase;</td> <td data-bbox="1095 850 1377 962">fatty acids / glycerol;</td> </tr> </tbody> </table>	Large food molecule	Enzyme involved in digestion	Small food molecule produced	starch	amylase	glucose / maltose;	protein;	protease	amino acids / polypeptides / peptides;	lipid	lipase;	fatty acids / glycerol;	Ignore simple sugars	5
Large food molecule	Enzyme involved in digestion	Small food molecule produced													
starch	amylase	glucose / maltose;													
protein;	protease	amino acids / polypeptides / peptides;													
lipid	lipase;	fatty acids / glycerol;													
(b)	<ol style="list-style-type: none"> 1. large surface area / microvilli; 2. thin / short diffusion distance / eq; 3. blood / capillaries / eq; 4. permeable; 5. lacteal; 	Ignore many villi / long villi	3												

Total 8 marks

Question number	Answer	Notes	Marks
4 (a)	(trap/absorb) light / eq; chlorophyll; photosynthesis / starch / glucose / eq;	ignore trap energy	2
(b)	A cell wall; B vacuole; C cytoplasm;		3
(c) (i)	C; A;		2
(ii)	starch removed / starch used / no starch / eq; (converted to) glucose; respiration / energy;		2
(iii)	boil (in ethanol) / heat (in ethanol)/ eq; ethanol / alcohol; no naked flame / water bath / hot water / in water / eq;	allow water mark if linked to boil / heat	3
(iv)	iodine / iodide;		1
		Total	13

Question number	Answer	Notes	Marks												
5(a)	1. iodine; 2. blue/black / blue black = starch; 3. Benedict's/ eq; 4. heat / use water bath / eq; 5. red/ orange / yellow / green = glucose;	if iodine for glucose goes blue black = 0 only award Mp1 and Mp3 if linked to correct test heat must be linked to Benedict's	4 max												
(b)	<table border="1" data-bbox="416 774 1400 1174"> <thead> <tr> <th data-bbox="416 774 736 880">Group</th> <th data-bbox="736 774 1077 880">Example from the group</th> <th data-bbox="1077 774 1400 880">Molecule used to store carbohydrate</th> </tr> </thead> <tbody> <tr> <td data-bbox="416 880 736 954">animals</td> <td data-bbox="736 880 1077 954">(cat)</td> <td data-bbox="1077 880 1400 954">glycogen;</td> </tr> <tr> <td data-bbox="416 954 736 1023">plants</td> <td data-bbox="736 954 1077 1023">(maize)</td> <td data-bbox="1077 954 1400 1023">starch / sucrose;</td> </tr> <tr> <td data-bbox="416 1023 736 1174">fungi</td> <td data-bbox="736 1023 1077 1174">mucor / yeast / mushroom / mould / eq;</td> <td data-bbox="1077 1023 1400 1174">glycogen;</td> </tr> </tbody> </table>	Group	Example from the group	Molecule used to store carbohydrate	animals	(cat)	glycogen;	plants	(maize)	starch / sucrose;	fungi	mucor / yeast / mushroom / mould / eq;	glycogen;	Ignore in plants sugar / glucose / fructose Allow <i>Fomes formentarius</i> / eq	4
Group	Example from the group	Molecule used to store carbohydrate													
animals	(cat)	glycogen;													
plants	(maize)	starch / sucrose;													
fungi	mucor / yeast / mushroom / mould / eq;	glycogen;													

Question number	Answer		Notes	Marks
6	C	plus and minus statin(s) / range / eq;	allow principles if lab based	6
	O	same gender / same age / same mass / same level of cholesterol / eq;	allow if use animals	
	R	several people / group of people / repeat the test / eq;		
	M1	measure cholesterol level;		
	M2	at start and at end / time stated / measure change;		
	S1+ S2	same diet / same mass of food / same stress / same exercise / same smoking / eq;;	ignore temperature / light / water	