PEARSON EDEXCEL GCSE BIOLOGY (HIGHER) · 1BI0

BIOLOGY



MARK SCHEME

TOPIC 1: KEY CONCEPTS IN BIOLOGY (PACK 4)

SCORE	PERCENTAGE
/19	%

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Mark Scheme

Q1.

	Answer	Acceptable answers	Mark
	• neutralisation (of stomach acid) / raise pH (1) • emulsification / break down of fats (1)	Accept makes stomach / intestine contents more alkaline Accept breaks down large droplets /globules / increases surface area of fats Reject molecules broken down	**(2)**

Q2.

		Indicative Content	
QWC	*	A description including some of the following points in sequence Names of enzymes: • carbohydrases • named carbohydrase eg amylase • proteases • named protease eg pepsin • lipases • named lipase General points about enzyme action: • breakdown of large / insoluble / named molecu / soluble / named molecules • for absorption • catalysts • speeds up reactions • active sites that bind to substrate • idea of specificity Specific points:	

		• carbohydrates/ starch are broken down • into sugars / glucose • proteins /named protein are broken down • into amino acids • fats / oils / lipids / named lipid are broken dow • into fatty acids /glycerol	
Level	**0**	No rewardable content	
1	**1 - 2**	• a limited description of enzyme action that includes at least three points • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, punctuation and grammar are used with limited accuracy	
2	**3 - 4**	• a simple description of enzyme action that includes at least six points • the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately • spelling, punctuation and grammar are used with some accuracy	
3	**5 - 6**	• a detailed description of at least nine points • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors	

Q3.

Question Number	Answer	Acceptable answers	Mark
(a)(i)	Correct substitution i.e. (-0.5 ÷ 10.3) x 100 (1) - 4.85 / - 4.9	Accept data correctly put into other acceptable methods. Accept answer with more decimal places eg: - 4.8543 / - 4.854368932 Full marks for correct bald answer award max of one mark if negative is not written eg 4.85 / 4.9	**(2)**

Question Number	Answer	Acceptable answers	Mark
(a)(ii)	better / easier / more valid comparison can be made between values /can make more valid conclusion / because the original / starting masses of potato were not the same / Idea of easier to visualise the size of the change	Ignore makes the results / test reliable / accurate	**(1)**

Question Number	Answer	Acceptable answers	Mark
(b)	A description including the following: • Produce two (daughter) cells • which are **genetically** identical • and diploid	Accept DNA for chromosomes throughout Also credit details of the process of mitosis chromosomes replicates (1) spindle fibres form / chromosomes attached to spindle (1) Chromosomes arranged on equator / middle of cell / chromosomes pulled apart /pulled to poles /separation of sets of chromosomes (1) Idea of nucleus reforming / New cell wall formed (to divide cell) / cytokinesis / description of cytokinesis (1)	**(3)**

Question Number		Indicative Content	Mark
QWC	* **(c)**	A explanation to include some of the following points • active transport requires energy • (active transport moves mineral ions) from the soil • into root (hair cells) • reference to pumps (in the cell membranes) • from a low concentration to a high concentration/against their concentration gradient • reference to mineral ions / mineral salts accept named minerals eg nitrates • diffusion is a passive process • gases diffuse from high to low concentration/down their concentration gradient • gas exchange in the leaf occurs by diffusion • carbon dioxide diffuses in • to air spaces in leaves / into cells • for photosynthesis / produces glucose • oxygen diffuses in • for respiration	**(6)**

Level		
0	**0**	No rewardable content
1	**1 - 2**	• a limited explanation that gives information about active transport **OR** diffusion in the correct context e.g. minerals ions are transported into root (hair cells) • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, punctuation and grammar are used with limited accuracy
2	**3 - 4**	• a simple explanation that gives details of active transport or diffusion transporting materials e.g. carbon dioxide diffuses into leaves down their concentration gradient OR a limited explanation of both active transport and diffusion • the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately • spelling, punctuation and grammar are used with some accuracy
3	**5 - 6**	• a detailed explanation that describes **both** processes e.g. active transport requires energy to transport mineral ions into the root hair cell AND carbon dioxide diffuses into the leaf for photosynthesis • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors

Q4.

Question number	Answer	Mark
(i)	An answer that combines points of interpretation and evaluation to provide a logical description: • proteinase K breaks down protein molecules (1) • in cell and nuclear membranes to release the DNA (1)	**(2)**

Question number	Answer	Mark
(ii)	An answer that combines points of interpretation and evaluation to provide a logical description: • Aseptic techniques should be used to minimise transfer of genetic material / pathogens (1) • By sterilising equipment / autoclaving equipment (1) • Using protective clothing including gloves / facemask / goggles to prevent contamination (1)	(3)

Question number	Answer	Mark
(iii)	An explanation that combines application of knowledge (1 mark) and reasoning/justification – application of understanding: (1 mark): • activity decreases during storage at 37 ^{0}C (1) • because the active site of the enzyme has been affected / because the substrate can no longer bind to the enzyme (1)	(2)

Q5.

	Answer	Acceptable answers	Mark
(a)(i)	A description including the following points: • increase in concentration of glucose / glucose diffused into water/eq (1) • levels off after 20 mins / at 0.79 g/cm^3(1)	small increase, followed by greater increase / eq	(2)
(a)(ii)	An explanation including **three**of the following points: • starch broken down into glucose (1) • by enzymes / amylase / carbohydrase (1) • glucose passes through visking tubing / eq (1)	reject: references to osmosis or active transport	(3)

	• by diffusion (1) • down the (glucose) concentration gradient (1) • (net) diffusion stops when {all starch is broken down / concentration of glucose is equal inside and outside the tubing}	accept: from area of high concentration to area of low concentration	

		Indicative Content	
QWC	***(a)(iii)**	An evaluation including some of the following points: Strengths • thin membrane • permeable membrane • presence of amylase • presence of (large) starch molecules • digestion into glucose • glucose diffuses out • concentration gradient • water represents the blood weaknesses • membrane not one cell thick • not a large surface area • shorter length / not same size • no villi /micro villi • only carbohydrate digestion • no other enzymes present • no peristalsis • no blood movement • other factors e.g. pH	
Level	**0**	No rewardable content	
1	**1 - 2**	• a limited evaluation of the model including **at least one**strength OR weakness of the model • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, punctuation and grammar are used with limited accuracy	
2	**3 - 4**	• a simple evaluation of the model showing evidence of **at least one**strength AND at least one weakness of the model OR a detailed evaluation of several strengths or several weaknesses of the model • the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately • spelling, punctuation and grammar are used with some accuracy	
3	**5 - 6**	• a detailed evaluation, commenting on **several**of the strengths AND weaknesses of the model and its limitations • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately	

		• spelling, punctuation and grammar are used with few errors	

	Answer	Acceptable answers	Mark
(b)	**C** store bile		**(1)**

Q6.

	Answer	Acceptable answers	Mark
(i)	Any **two** of the following points: (yeast cell) • has a nucleus (1) • does not have a flagellum (1) • does not have a plasmid (1) (bacterial cell) • has chromosomal DNA / circular DNA (1) • has a capsule (1) • has a slime coat (1) • does not have mitochondria (1)	Accept: has a vacuole accept: named bacterial feature e.g pilli, small ribosome, if not labelled in yeast cell	**(2)**
(ii)	does not have chloroplasts/chlorophyll	cannot photosynthesise	**(1)**