PEARSON EDEXCEL GCSE COMBINED SCIENCE (HIGHER) · 1SC0

BIOLOGY



MARK SCHEME

TOPIC 1: KEY CONCEPTS IN BIOLOGY (PAPER 1, PACK 1)

SCORE	PERCENTAGE
/133	%

STEMUP

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Mark Scheme

Q1.

	Answer	Acceptable answers	Mark
	An explanation including **two** of the following points: • ref to specific shape (1) • to bind to substrate / form enzyme substrate complex (1) • for reaction to take place / catalysed(1) • joining together {substrates / molecules} / break down		**(2)**

	{substrates / molecules} (1) • ref to lock and key mechanism / hypothesis (1)		

Q2.

	Answer	Acceptable answers	Mark
	An explanation including **two**of the following points: • ref to specific shape (1) • to bind to substrate / form enzyme substrate complex (1) • for reaction to take place / catalysed(1) • joining together {substrates / molecules} / break down {substrates / molecules} (1) • ref to lock and key mechanism / hypothesis (1)		**(2)**

Q3.

Question number	Answer	Mark
(i)	all the starch has been converted into glucose / all the starch has reacted with the amylase / all the starch is digested (1)	**(1)** **AO3 2a**

Question number	Answer	Mark
(ii)	Any two from: • pH of the solution (1) • concentration of amylase (1) • concentration of starch (1) • amount of mixing (1) • size of the tube used (1) • time interval must be the same (1)	**(2)** **AO2 2**

Question number	Answer	Additional guidance	Mark
(iii)	it is a control/to check that starch doesn't breakdown into glucose without amylase (1)	ignore control variable ignore allow results to be compared	**(1)** **AO2 2**

Q4.

Question number	Answer	Additional guidance	Mark
(i)	Substitution (50 – 30 =) 20 (1) (20 ÷ 50 x 100 =) - 40(%)	 Accept 40% award full marks for answer without working	**(2)** **AO2.1**

Question number	Answer	Additional guidance	Mark
(ii)	Any **two** from: • variety of potato (1) • mass of potato (1) • age of potato (1) • temperature (1) • storage conditions/humidity (1)	 accept type / species accept weight/size accept potato cells taken from the same part of each potato	**(2)** **AO2.2**

Question number	Indicative content	Additional guidance	Mark
(iii)	for energy / respiration	ignore make / produce energy accept to produce ATP	(1) AO2.1

Question number	Indicative content	Additional guidance	Mark
(iv)	Any two from: • enzyme / amylase / carbohydrase (1) • starch fits into the **active site** (1) • bonds (between glucose molecules in starch) broken (1)	 accept maltase accept polymer broken down into monomers	(2) AO2 1

Q5.

Question number	Answer	Mark
(i)	A they have membrane-bound organelles **The only correct answer is A** **B** *is not correct because they have a nucleus* ***C*** *is not correct because they do not have a cell wall* ***D*** *is not correct because this is not a specific feature of eukaryotic cells*	(1) AO1 1

Question number	Answer	Additional guidance	Mark
(ii)	genetic analysis / based on {DNA/genetics} / DNA of Archaea more similar to eukaryotes (1)	accept more knowledge because of better microscopes	(1) AO1 1

Q6.

Question number	Answer	Mark
(i)	D proteins The only correct answer is **D** proteins A is incorrect because carbohydrates are broken down by carbohydrases /amylase B is incorrect because lipids need to be digested by lipase C is incorrect because fibre is not broken down by enzymes	**(1)** **AO1.2**

Question number	Answer	Additional guidance	Mark
(ii)	An explanation linking the following: • to increase the surface area of the food (1) • so trypsin will break down more protein (1)	 accept the food molecules are smaller accept there is a faster rate of reaction	**(2)** **AO2.2**

Q7.

Question number	Answer	Additional Guidance	Mark
(i)	61 to be left out of the calculation (1) Substitution $\frac{53.0 + 51.2 + 52.8}{3}$ Evaluation = 52.3	Accept correct calculation using all 4 numbers for 1 mark (54.5)	**(2)**

Question number	Answer	Mark
(ii)	An analysis to develop an experimental procedure (2 marks) • only test the range between 6 and 8 (1) • with more intervals within this range (1)	(2)

Q8.

Question number	Answer	Additional guidance	Mark
(i)	**Measurement** 65 (mm) / 6.5 cm (1) **Conversion** 65 mm = 65 000 µm (1) **OR** 6.5 cm x 10 000 = 65 000 µm (1) **Division** 65 000 ÷ 50 000 (1) 1.3 (µm)	 accept 63 mm – 66 mm ecf from incorrect measurement 0.0013 x 1000 (1) ecf from incorrect conversion accept 6.5 ÷ 50 000 (1) 65 ÷ 50 000 (1) correct answer on answer line with no working 3 marks accept 1.26/1.28/1.32 (µm) for 3 marks	(3) AO1(2)

Question number	Answer	Additional guidance	Mark
(ii)	An answer including three of the following: • no nucleus /chromosomal DNA (1) • cell wall (1) • flagellum (1) • presence of ribosomes (1) • no membrane bound organelles / no mitochondria (1)	List rule applies: reject nucleus reject mitochondria accept DNA is in the cytoplasm accept: pilli (1) slime {coat / capsule / layer}(1) ignore: cell membrane / cytoplasm / chloroplast	**(3)** AO1 (1)

Q9.

Question number	Answer	Additional Guidance	Mark
(i)	$2.0 \times 10^8 - 1.6 \times 10^7$ / 200 000 000 – 16 000 000 /184 000 000 (1) 1.84×10^8 / 1.8×10^8	award full marks for correct answer accept 18.4×10^7 or 18×10^7 for 1 mark	**(2)** AO2(1)

Question number	Answer	Additional guidance	Mark
(ii)	An explanation linking: • (myelination) speeds up impulses (1) • insulates the {axon/neurone} (1) • motor neurones transmit information from the CNS / motor neurones transmit information to effectors / neurones in the brain connect to other neurones in the brain (1) • (motor neurones) transmit information over a greater distance (than neurones in the brain) (1)	accept signals/messages for impulses accept brain/spinal cord/relay neurone for CNS accept muscles/ glands for effectors accept idea that motor neurones can be part of a reflex so need quick impulses (1)	**(3)** AO2(1)

Q10.

Question number	Answer	Mark
(i)	C a cell wall **1. The only correct answer is C** ***A*** *is not correct because both plant and animal cells have cytoplasm* ***B*** *is not correct because both plant and animal cells have a cell membrane* ***D*** *is not correct because both plant and animal cells have mitochondria*	**(1)** AO 1 1

Question number	Answer	Additional guidance	Mark
(ii)	Substitution 20.5 x 400 (1) Evaluation 8 200 (µm)	award full marks for correct answer with no working	**(2)** AO 1 2

Question number	Answer	Additional guidance	Mark
(iii)	Substitution (3.08 ÷ 400) = 0.0077 (1) Evaluation 7.7×10^{-3}	award full marks for correct answer with no working accept 0.008 accept 8.0×10^{-3}	**(2)** AO 2 2

Q11.

Question number	Answer	Additional Guidance	Mark
	division 0.0062 ÷ 2 / 6.2 ÷ 2 (1) **OR** unit conversion 0.0031 x 1000 / 0.0062 x 1000 (1) 3.1 (picograms)	award full marks for correct answer with no working accept 6.2/ 0.0031 for 1 mark with no working	**(2)** AO2(1)

Q12.

Question number	Answer		Mark
(i)	6 / six		**(1)** **AO1.2**

Question number	Answer	Mark
(ii)	D cell wall, chloroplast, large vacuole. The only correct answer is **D** cell wall, chloroplast, large vacuole A is incorrect because both the cell membrane and nucleus are also found in animal cells B is incorrect because the cell membrane and cytoplasm are also found in animal cells C is incorrect because the nucleus is also found in animal cells	**(1)** **AO1.1**

Q13.

Question number	Answer	Mark
(i)	Substitution 1.84 – 2.15 = -0.31 (1) change in mass Evaluation -0.31 ÷ 2.15 = -0.144 (1) Correct decimal places -0.144 x 100 = -14.41 (%) (correct to 2 dec place)	**(3)**

Question number	Answer	Additional guidance	Mark
(ii)	An explanation that combines application of knowledge (1 marks) and reasoning/justification – application of understanding: (2 mark) • chip 2 has gained mass but chip 5 has lost mass (1) • because chip 2 was immersed in a solution where the sucrose concentration outside the chip was lower than the sucrose concentration inside the chip (1) • so water osmosed into the chip causing it to become turgid / so chip water osmosed out of chip 5 and it became plasmolysed (1)	Accept reverse argument for chip 5	(3)

Q14.

Question number	Answer	Additional guidance	Mark
(i)	• mean= 588/5 = 117.6 (1) • rate = 1 ÷ 117.6 (1) • 0.0085 (1)	award full marks for correct numerical answer without working accept 1000/*t* accept 10/*t*	(3)

Question number	Answer	Mark
(ii)	Any one variable from: • concentration of the enzyme • volume of enzyme solution • volume of starch solution • pH of the solutions	(1)

Q15.

Question Number	Answer	Additional guidance	Mark
(i)	(2 x 5.0 x 2.0) + (2 x 5.0 x 2.0) + (2 x 2.0 x 2.0) or 20 + 20 + 8 (1) 48.0	allow full marks for correct final answer accept 48	**(2)** AO 1 1

Question Number	Answer	Additional guidance	Mark
(ii)	• chip B has greater surface area (1) • therefore **more** water {absorbed / moved into the potato chip} (1)	accept chip B is bigger / has more cells	**(2)** AO 3 2a AO 3 2b

Question Number	Answer	Additional guidance	Mark
(iii)	An explanation that links the following: • (cells) lose water / become plasmolysed (1) followed by • (water moves out) by <u>osmosis</u> (1) • from a high concentration of water molecules (in the potato) to a low concentration of water molecules (in the solution) / through the partially permeable membrane (to the salt solution) (1)	 accept get smaller/shrink/lose mass accept from low solute concentration to a high solute concentration accept from high to low water potential	**(3)** AO 1 1

Q16.

Question Number	Answer	Additional Guidance	Mark
	measurement 45 (mm) / 4.5 **cm** (1) calculation (45 ÷ 700) = 0.0643 (1) conversion into standard form and millimetres 6.43 x 10^{-2} / 6.4 x 10^{-2}	award full marks for the correct answer with no workings allow 44-46 (mm) allow ecf for incorrect measurement allow ecf for incorrect substitution accept answer to any number of decimal places	**(3)** **AO1 1**

Q17.

Question number	Answer	Mark
(i)	Substitution 6mm ÷ 750 (1) Evaluation = 0.008 mm (1) Conversion = 8.0 x 10^{-3} mm	**(3)**

Question number	Answer	Mark
(ii)	B	**(1)**

Q18.

	Answer	Acceptable answers	Mark
(a)(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)**
(a)(ii)	does not have chloroplasts/chlorophyll	cannot photosynthesise	**(1)**
(b)(i)	7×10^{9} (-) 5×10^{10} **(1)** **=**(-)4.3×10^{10} or (-)43×10^{9}	two marks for correct bald answer accept 43 000 000 000 allow one mark for correct subtraction from wrongly selected numbers only accept the numbers in the table with a correct minus calculation	**(2)**
(b)(ii)	A description including any **two** of the following points: • involved in defence against disease / part of immune system (1) • phagocytosis (1) • antibody / antitoxin production (1)	accept: (fight pathogen / harmful microorganism / named microorganism) accept: engulf / ingest / surround /digest cells reject: <u>make</u> antigens ignore: refs to role of red blood cells or platelets	**(2)**
(b)(iii)	tired / lack of energy / lethargy / short of breath	anaemia /fainting / less oxygen / increased anaerobic respiration reject: references to asthman	**(1)**

Q19.

	Answer	Acceptable answers	Mark
(a)(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)**
(a)(ii)	does not have chloroplasts/chlorophyll	cannot photosynthesise	**(1)**
(b)(i)	7×10^{9} (-) 5×10^{10} **(1)** =(-)4.3×10^{10} or (-)43×10^{9}	two marks for correct bald answer accept 43 000 000 000 allow one mark for correct subtraction from wrongly selected numbers only accept the numbers in the table with a correct minus calculation	**(2)**
(b)(ii)	A description including any **two** of the following points: • involved in defence against disease / part of immune system (1) • phagocytosis (1) • antibody / antitoxin production (1)	accept: (fight pathogen / harmful microorganism / named microorganism) accept: engulf / ingest / surround /digest cells reject: <u>make</u> antigens ignore: refs to role of red blood cells or platelets	**(2)**
(b)(iii)	tired / lack of energy / lethargy / short of breath	anaemia /fainting / less oxygen / increased anaerobic respiration reject: references to asthman	**(1)**

Q20.

Question Number	Answer	Acceptable answers	Mark
(a)(i)	nucleus (1)		**(1)**

Question Number	Answer	Acceptable answers	Mark
(a)(ii)	**C** In DNA, the bases A - T are complementary		**(1)**

Question Number	Answer	Acceptable answers	Mark
(b)	A definition including two of the following: • a sperm fuses with egg / penetrates the egg (1) • nuclei/genetic information fuses /combines (1) • reference to haploid gametes /gametes have 23 chromosomes (1) • reference to cell made being diploid / has 23 pairs of chromosomes / zygote formed (1)	Ignore sperm meets egg	**(2)**

Question Number	Answer	Acceptable answers	Mark
(c)(i)	A description that includes the following: • (aerobic) respiration / using glucose / using oxygen (1) • energy released (for movement / swimming / metabolism)(1)		**(2)**

Question Number	Answer	Acceptable answers	Mark
(c)(ii)	An explanation including **two** of the following: • a change in a base/base sequence/order of bases / a change in mRNA (1) • named change e.g. addition/deletion (1) • reference to change in an amino acid / order of amino acids (1)	Accept codon, triplet, genetic code for base. substitution/deletion/other named gene mutation.	**(2)**

Q21.

Question Number	Answer	Acceptable answers	Mark
(a)(i)	nucleus (1)		**(1)**

Question Number	Answer	Acceptable answers	Mark
(a)(ii)	**C** In DNA, the bases A - T are complementary		**(1)**

Question Number	Answer	Acceptable answers	Mark
(b)	A definition including two of the following: • a sperm fuses with egg / penetrates the egg (1) • nuclei/genetic information fuses /combines (1) • reference to haploid gametes /gametes have 23 chromosomes (1) • reference to cell made being diploid / has 23 pairs of chromosomes / zygote formed (1)	Ignore sperm meets egg	**(2)**

Question Number	Answer	Acceptable answers	Mark
(c)(i)	A description that includes the following: • (aerobic) respiration / using glucose / using oxygen (1) • energy released (for movement / swimming / metabolism)(1)		**(2)**

Question Number	Answer	Acceptable answers	Mark
(c)(ii)	An explanation including **two** of the following: • a change in a base/base sequence/order of bases / a change in mRNA (1) • named change e.g. addition/deletion (1) • reference to change in an amino acid / order of amino acids (1)	Accept codon, triplet, genetic code for base. substitution/deletion/other named gene mutation.	**(2)**

Q22.

Question number	Answer	Additional guidance	Mark
(i)	Any one from: • keep leaf peel flat (1) • keep leaf peel in place (1) • protect the (objective) lens (1) • protect the specimen (1)	ignore to prevent drying out	**(1)** AO 2 2

Question number	Answer	Additional guidance	Mark
(ii)	An explanation linking **two** of the following: • the leaf peel is thin / leaf is too thick (1) • as the leaf peel allows light to pass through it/the leaf would not allow light to shine through it (1) • to enable the {stomata / cells/ guard cells} to be identified (1)	accept leaf would be opaque accept to see stomata / cells	**(2)** AO 2 2

Q23.

Question number	Answer	Mark
(i)	B	(1)

Question number	Answer	Mark
(ii)	TACGTACATGGC	(1)

Question number	Answer	Additional guidance	Mark
(iii)	• 3.33×10^{-10} equals 0.33 nm (1) • 0.33 × 250 = 82.5 (nm) (1)	maximum one mark if no conversion to nm award full marks for correct numerical answer without working	(2)

Q24.

Question number	Answer	Additional guidance	Mark
	• 68 ÷ 8000 (1) • 0.0085 (1) • 8.5 (μm) (1)	award full marks for correct numerical answer without working	(3)

Q25.

	Answer	Acceptable answers	Mark
	to supply / contain (a large amount of) nutrients / energy (for the zygote / embryo)	food /named nutrient Ignore references to foetus Reject baby	**(1)**

Q26.

	Answer	Acceptable answers	Mark
	to supply / contain (a large amount of) nutrients / energy (for the zygote /	food /named nutrient	

	embryo)	Ignore references to foetus Reject baby	**(1)**

Q27.

Question number	Answer	Mark
(i)	An explanation that combines identification – application of knowledge (1 mark) and reasoning/justification – application of understanding (1 mark): • fatty acids are formed when the lipids are broken down by lipase (1) • and fatty acids are acidic (so the pH decreases) (1)	**(2)**

Question number	Answer	Mark
(ii)	An answer that combines up to a maximum of **two** points to provide a logical description: • as the temperature increases from 20 °C to 37 °C the rate of lipase activity increases (from 0.2 to 0.8) (1) • the rate of lipase activity is optimal at 37 °C (1) • above 37 °C the rate of lipase activity decreases (from 0.8 to 0.1) (1)	**(2)**

Question number	Answer	Mark
(iii)	An explanation that combines identification – application of knowledge (1 mark) and reasoning/justification – application of understanding (1 mark): • an increase in temperature above 40 °C causes changes in the shape of the active site of the enzyme (1) • therefore the enzyme becomes denatured and no longer functions (1)	**(2)**

Q28.

Question Number	Answer	Additional Guidance	Mark
	Structure A • the mitochondria {**release energy** / for respiration} (1) **Structure B** • {acrosome / contains enzymes} to digest the egg cell membrane (1)	reject produces / creates energy	**(2)** **AO1 1**

Q29.

Question number	Answer	Additional guidance	Mark
	A description including **four** of the following: • use the {root tip / meristem} (1) • Soften the root (with alcohol/heat/acid) (1) • crush the root onto the slide/take a thin section (1) • Stain the root / named stain (1) • Add a drop of water to the slide (1) • Add a cover slip (1)	accept the end of the root for root tip accept description of a root squash accept use a layer of cells accept dye ignore ink accept another slide / description of a cover slip	**(4)** **A03 3a**

Q30.

Question Number	Answer	Additional Guidance	Mark
	An answer including: • use the x40 **objective** lens (1) and **one** from: • use the x10 **eye piece** lens (1) • use the focusing wheel (1)	 accept other combinations of x 400 lenses for two marks accept move the {stage / lens}	**(2)** **AO1 1**

Q31.

Question number	Answer	Mark
(i)	A description that combines analysis via a judgement (1 mark) to reach a conclusion (1 mark) • as the pH of the hydrogen peroxide increases to pH 7 the catalase activity increases / above pH7 the activity of catalase decreases / less oxygen is produced (1) • catalase activity is optimal at pH7 (1)	**(2)**

Question number	Answer	Mark
(ii)	An explanation that combines application of knowledge (1 mark) and reasoning/justification – application of understanding (2 marks) • decrease in volume of oxygen produced (1) • as catalase denatures and there is less breakdown of hydrogen peroxide (1) • because less enzyme substrate complexes form (1)	**(3)**

Question number	Answer	Mark
(iii)	Any two variables from: • catalase concentration • catalase volume • hydrogen peroxide concentration • hydrogen peroxide volume • temperature	(2)

Q32.

Question number	Answer	Additional guidance	Mark
(i)	Two from: • (meristem cells) are undifferentiated • (meristem cells) divide / produce more cells (1) • by mitosis (1)	accept are stem cells accept (the cells produced) can differentiate /become specialised/elongate (1)	(2) AO1 1

Question number	Answer	Additional guidance	Mark
(ii)	An answer including: • use a thin section of {cells/meristem} (1) • add a stain / named stain (1) • place a cover slip on top of the sample (1)	accept add a sample of the cells to the microscope slide accept a description of a coverslip	(3) AO1 2

Q33.

Question number	Answer	Additional guidance	Mark
(i)	A description including **two** of the following: • {as pH increases to pH 4/more acidic/low pH} the time taken for the food to digest {decreased/was shorter} (1) • The shortest time was pH 4 (1) • {after pH 4 to pH 6/above pH 4} the time taken for the food to digest increased/was longer} (1)	accept time data instead of pH data accept optimum pH was at pH 4 accept time data instead of pH data	**(2)** **AO3.1ab**

Question number	Answer	Additional guidance	Mark
(ii)	substitution 1.5 ÷ 42 = 0.035(7142857) (1) Evaluation 0.04 (g per minute)	accept any correctly rounded value e.g 0.036	**(2)** **AO1.2**

Question number	Answer	Additional guidance	Mark
(iii)	An explanation linking two of the following: • the rate of reaction at pH 1 is slower (1) • because enzymes are becoming denatured /changing the conformation of the active site / stopping enzyme substrate complexes forming (1) OR • pH 4 is the optimum pH (1) • because at pH 4 more enzyme substrate complexes are formed / more active sites of the enzyme are filled (1)	accept so that the substrate cannot bind accept rate of reaction is fastest at pH 4	**(2)** **AO1.2**

Q34.

Question number	Answer		Mark
	A plan including three of the following: • mix starch solution with amylase (1) • use different pH values (1) • using buffers / test at pH solutions between pH 6.5 and 7.5 (1) • control named variables (1) • a method of testing for glucose/a method of testing for starch • the sample that produces glucose in the shortest time is closest to the **optimum** (1)	ignore mix the solutions accept ranges around 5 to 8 accept **test** the sample for starch/glucose	**(3)** **AO3 3b**

Q35.

Question number	Answer	Additional Guidance	Mark
	An answer that combines the following points to provide a plan: • Mix equal {number of beads/volume of lactase} with equal volume of lactose (1) • (incubate the tubes) at different temperatures (1) • test for (the presence of) glucose (at regular intervals) / time how long it takes to produce glucose (1)	accept heat for temperature accept the temperature that produces glucose quickest is the optimum	**(3)** AO3 3b

Q36.

	Answer	Acceptable answers	Mark
(a)	**C** peristalsis		**(1)**
(b)	• 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)**

		Indicative Content
QWC	***(c)**	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	

	Answer	**Acceptable answers**	**Mark**
(d)	An explanation linking three of the following points • (E) more /fast / maximises diffusion / absorption (1) • (S) microvilli (1) • (E) large surface area (1) • (S) single layer of cells / one cell thick / thin walls (1) • (E) small diffusion distance (1) • (S) capillary network / good blood supply / capillaries inside villus (1) • (E) maintains diffusion gradient (1)	To award all three marks at least one structure (S) and explanation (E) must be linked together. Award once, linked to any structure Ignore efficient (in stem) / easier Reject ref to cell wall	**(3)**

Q37.

	Answer	**Acceptable answers**	**Mark**
(a)	**C** peristalsis		**(1)**
(b)	• 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)**

		Indicative Content	
QWC	***(c)**	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

	Answer	Acceptable answers	Mark

(d)	An explanation linking three of the following points • (E) more /fast / maximises diffusion / absorption (1) • (S) microvilli (1) • (E) large surface area (1) • (S) single layer of cells / one cell thick / thin walls (1) • (E) small diffusion distance (1) • (S) capillary network / good blood supply / capillaries inside villus (1) • (E) maintains diffusion gradient (1)	To award all three marks at least one structure (S) and explanation (E) must be linked together. Award once, linked to any structure Ignore efficient (in stem) / easier Reject ref to cell wall	**(3)**

Q38.

	Answer	**Acceptable answers**	**Mark**
	C peristalsis		**(1)**

Q39.

	Answer	**Acceptable answers**	**Mark**
	C peristalsis		**(1)**

Q40.

Question Number	Answer	Additional guidance	Mark
(i)	• a diagram of the cell that reflects its shape and some of the structures (1) • with any **three** cell structures from {nucleus / cytoplasm / membrane / cilia} (3)	ignore a 'textbook' diagram that does not resemble cell A	**(4)** **AO1 2**

Question Number	Answer	Additional guidance	Mark
(ii)	to {move/waft} {mucus / bacteria / dust}	ignore stop bacteria entering the body / trap bacteria	**(1)** **AO1 1**