

1)

(a)		Low(er) <u>water potential</u> in lumen / intestine / gut; Water enters lumen / leaves (body) cells / by <u>osmosis</u> ;	2	Accept: hypertonic instead of low(er) water potential Neutral: water does not leave lumen by osmosis Q Water potential must be in the correct context
(b)	(i)	(Lactose +) Water; → (Glucose +) Galactose;	2	Accept: H ₂ O for water
(b)	(ii)	Hydrolysis;	1	Accept: if phonetically correct
(c)	(i)	(Add Biuret reagent to both solutions) – no mark; Lactase / enzyme will give purple / lilac / mauve; OR Lactose / reducing sugar will not give purple / lilac / mauve / will remain blue;	1	Neutral: positive / negative result Neutral: incorrect reference to the method
(c)	(ii)	Lactase / enzyme is a protein;	1	Accept: lactase / enzyme contains peptide bonds

2)

(a)	(i)	Increases then plateaus / constant / steady / rate does not change; Correct reference. to 27/28 units; e.g. increases up to / plateaus at 27/28	2	Neutral: 'peaks' / 'reaches a maximum' / 'stops increasing' / 'no effect' instead of 'plateaus' Reject: rate decreases / reaction stops
(a)	(ii)	Substrate concentration / amount of substrate; As substrate concentration increases, rate increases / positive correlation (between rate and substrate concentration);	2	
(a)	(iii)	All <u>active sites</u> occupied / saturated / enzyme limiting (rate of reaction) / maximum number of E-S complexes;	1	Reject: enzymes used up Reject: substrate limits rate of reaction Neutral: substrate no longer limits the reaction Neutral: reference to temperature
(b)		Curve is lower and plateaus at a higher substrate concentration (it must also start at zero);	1	Accept: curve lower and joins existing curve at final point (with no plateau) Reject: if curve plateaus before original Reject: if curve plateaus lower than original
(c)	(i)	Methotrexate / drug is a similar shape / structure to substrate; Binds to / fits / is complementary to <u>active site</u> ; Less substrate binds / less enzyme-substrate complexes formed;	2 max	Q Reject: same structure / shape Q Reject: reacts with active site Accept: substrate cannot bind / enzyme-substrate complex not formed
(c)	(ii)	Methotrexate / drug is only similar shape to specific substrate / only fits this <u>active site</u> ; OR Methotrexate / drug is a different shape to other substrates / will not fit other <u>active sites</u> ;	1	Assume that 'it' refers to the drug

3)

(a)	(i)	Mitochondrion;	1	Neutral: cristae
(a)	(ii)	(Site of aerobic) respiration / ATP production / energy release; Active transport / transport against the concentration gradient;	2	Q Reject: anaerobic respiration Q Reject: energy produced Accept: energy produced in the form of ATP
(b)		89 – 91 gains 2 marks; Principle of: <u>correct measured length</u> gains 1 mark; magnification	2	Correct answer gains 2 marks outright 89-91 (mm) / 1000 <u>or</u> 8.9-9.1 (cm) / 1000 gains 1 mark
(c)		Suitable explanation given e.g. Reduced <u>surface area</u> ; (So) less absorption; (Membrane-bound) enzymes less effective; (So) proteins / polypeptides not digested; Cell membranes damaged; (So) Fewer / less effective carrier / channel proteins; Carrier / channel proteins damaged; (So) less absorption;	2	Accept: converse arguments Neutral: structure Z incorrectly named Reduced surface area for absorption gains 2 marks Accept: references to diffusion and active transport for 'absorption' Reject: active transport if linked to channel proteins

4)

(a)	(i)	1.08;	1	Must be to 3 significant figures, as in the table
(a)	(ii)	Allows comparison / shows proportional change; Idea that discs had different starting masses / weights;	2	<i>Neutral</i> : sizes / amounts <i>Neutral</i> : different masses
(a)	(iii)	(Allows) Anomalies to be identified / effect of anomalies to be reduced / effect of variation in data to be minimised; A <u>mean</u> to be calculated;	2	<i>Accept</i> : outliers instead of anomalies <i>Reject</i> : idea of not recording anomalies / preventing anomalies from occurring <i>Neutral</i> : average
(b)	(i)	Plot (sodium chloride) concentration against ratio / draw line of best fit; Find (sodium chloride concentration from the graph) where the ratio is 1 / there is no change in mass;	2	<i>Reject</i> : if wrong axes or type of graph
(b)	(ii)	Line / curve of best fit is more reliable / precise; Intercept / point where line crosses axis is more reliable / precise; OR Can plot SD values / error bars; (To show) variability about the mean / how spread out the results are;	2	<i>Neutral</i> : graph <i>Reject</i> : references to 'more accurate'

5)

(a)	<table border="1"> <tr> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td>✓</td> </tr> <tr> <td></td> <td></td> <td>✓</td> <td>✓</td> </tr> </table>	✓	✓	✓					✓			✓	✓	4	One mark for each correct column Mark ticks only and ignore crosses
✓	✓	✓													
			✓												
		✓	✓												
(b)	<ol style="list-style-type: none"> Two marks for box round two hydrogens and one of the oxygens from OH groups on carbons 1 and 4; One mark from incorrect answer involving any two hydrogens and an oxygen from carbons 1 and 4; 	2	Do not award marks if all atoms concerned are on same carbon atom or are on carbon atoms other than 1 and 4 or where the answer does not have two hydrogen and one oxygen												
c)(i)	<ol style="list-style-type: none"> Holds chains/cellulose molecules together/forms cross links between chains/cellulose molecules/forms microfibrils; Providing strength/rigidity (to cellulose/cell wall); Hydrogen bonds strong in large numbers; 	2 max	Principles here are first mark for where hydrogen bonds are formed and second for a consequence of this. Accept microfibrils												
c)(ii)	Compact/occupies small space/tightly packed;	1	Answer indicates depth required. Answers such as "good for storage", "easily stored" or "small" are insufficient.												

6)

(a)(i)	Cells are in interphase;	1	Accept G phase/ S phase.
(a)(ii)	Cells undergoing mitosis/in telophase/cytokinesis;	1	Accept all named stages but reject prophase, metaphase or anaphase on their own.
(b)	<ol style="list-style-type: none"> 3 hours; Time between beginnings/endings DNA replication/Increases/levelling out of DNA concentration/for shape (of curve for replication) to be repeated; (DNA) replication takes place once per cell cycle; 	3	Allow close approximation where candidate attempts to be more accurate. Principle What is shown on the graph

7

CHERRY HILL TUITION AQA BIOLOGY AS PAPER 1 MARK SCHEME (U1:1/3/4/5.JA10+U2:1/7JA11)

<p>1 2 3 4 5 6 7</p>	<p>(Simple / facilitated) <u>diffusion</u> from high to low concentration / down <u>concentration gradient</u>;</p> <p>Small / non-polar / lipid-soluble molecules pass via phospholipids / bilayer;</p> <p>OR</p> <p>Large / polar / water-soluble molecules go through proteins;</p> <p><u>Water</u> moves by osmosis / from high water potential to low water potential / from less to more negative water potential;</p> <p><u>Active transport</u> is movement from low to high concentration / against <u>concentration gradient</u>;</p> <p>Active transport / <u>facilitated diffusion</u> involves proteins / carriers;</p> <p>Active transport requires energy / ATP;</p> <p>Ref. to Na⁺ / glucose co-transport;</p>	<p>5 max</p>	<p>Q Do not allow across / along / with concentration gradient</p> <p><i>Reject:</i> named molecule passing through membrane by an incorrect route for point 2</p> <p><i>Accept:</i> diagrams if annotated</p> <p>Only penalise <u>once</u> if active transport is not named in point 4. e.g. 'movement against the concentration gradient involves proteins and requires ATP' = 2 marks</p> <p><i>Accept:</i> facilitated diffusion involves channels for point 5</p> <p><i>Reject:</i> active transport involves channels for point 5</p> <p>Credit ref. to endo/exocytosis as an alternative to point 7</p>
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