

CHERRY HILL TUITION EDEXCEL (B) BIOLOGY AS PAPER 2 MARK SCHEME

1) 11/10/21 (a)	<ol style="list-style-type: none"> 1. protein / glycoprotein ; 2. facilitated diffusion ; 3. active transport / eq ; 4. ATP / adenosine triphosphate ; 	(4)
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Question number	Answer	Mark
b)(i)	<ol style="list-style-type: none"> 1. 77-70 / 7; 2. correct division by 77 (multiplied by 100) to give correct answer, e.g. 9.1 / 9.09 / 9.0 / 9 <p>[CE applies]</p> <p>Correct answer = 2 marks</p>	(2)

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Question number	Answer	Mark
(b)(ii)	<ol style="list-style-type: none"> idea that not all of the {juice / sugar} washed off / idea that the strawberries were not dried after rinsing properly / idea that some water reabsorbed (during washing) ; loss of mass of strawberries not as high as it should have been / eq ; (%) value too small / eq ; <p>OR</p> <ol style="list-style-type: none"> idea that strawberry {tissue / juice} lost because {washing too vigorous / tissue stuck to towel when drying / squeezing strawberries / juice absorbed from strawberries} / water lost through evaporation / eq ; loss of mass of strawberries higher than it should have been / eq ; (%) value too high / eq ; 	(3)

Question number	Answer	Mark
(b)(iii)	<ol style="list-style-type: none"> correct reference to <u>water</u> gradient (between sugar and strawberries) ; reference to osmosis (of water from inside of strawberry to outside) ; idea that water is found in {cytoplasm / vacuoles} (of strawberry) ; reference to water as a solvent (for the sugar) ; reference to (di)polar nature of water / eq ; 	(3)

2)

Question number	Answer	Mark
(a)(i)	<ol style="list-style-type: none"> both hexose molecules in disaccharide correctly drawn ; indication that water is formed ; glycosidic bond correctly drawn ; 	(3)

Question number	Answer	Mark
(a)(ii)	condensation / polymerisation ;	(1)

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Question Number	Answer	Mark
a)(iii)	(1, 4) glycosidic (bond / link) ;	(1)

Question Number	Answer	Mark
b)(i)	A ;	(1)

Question Number	Answer	Mark
b)(ii)	B ;	(1)

Question Number	Answer	Mark
b)(iii)	B ;	(1)

Question Number	Answer	Mark
c)(i)	<ol style="list-style-type: none"> 1. genotypes of parents correctly shown ; 2. alleles present in gametes correctly shown ; 3. possible genotypes of offspring correctly shown ; 4. probability stated as {0.5 / 50% / 1 in 2 / ½ / 50:50} ; 	(4)

Question Number	Answer	Mark
c)(ii)	The same (as the probability is for the first child) ;	(1)

3)

Question number	Answer	Mark
(a)	(DNA) { polymerase / helicase / ligase} ;	(1)

Question number	Answer	Mark
(b)	<p>Stage 1</p> <p>1. only one bond drawn in lower half of tube ;</p> <p>Stage 2</p> <p>2. one only bond drawn (higher than the one drawn in stage 1) ;</p> <p>Stage 3</p> <p>Diagram</p> <p>3. {1 / 2} molecules shown with one light and one heavy strand ;</p> <p>4. {1 / 2} molecules shown with two light strands;</p> <p>Test tube</p> <p>5. 2 bands shown in roughly correct position (middle to upper half of test tube) ;</p> <p>6. bands should be of (roughly) equal width ;</p> <p>[consequential error from stage 2 should apply for both marking points 5 and 6]</p>	(6)

4)

(a)	<p>1. presence of amine group / eq ;</p> <p>2. presence of carboxyl group / eq ;</p> <p>3. reference to R group ;</p> <p>4. reference to central carbon atom ;</p> <p>[award marks on correctly drawn diagram]</p>	(2)
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b)	<ol style="list-style-type: none"> 1. correct reference to transcription ; 2. DNA {unwinds / strands separate / eq} ; 3. (RNA) (mono)nucleotides {line up against / attach / eq} to one (DNA) { strand / template / eq} ; 4. reference to <u>complementary</u> base pairing (between DNA and (mono)nucleotides) ; 5. reference to {(mono)nucleotides joining together / formation of phosphodiester bonds} ; 6. correct reference to condensation reaction ; 7. correct reference to named enzymes involved / eq ; 8. mRNA detaches (from DNA) / eq ; 	(4)
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c)(i)	DISCOUNTED QUESTION / DO NOT MARK	(0)
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Question number	Answer	Mark
(c)(ii)	B ;	(1)

Question number	Answer	Mark
(c)(iii)	D ;	(1)

5) (a)	<ol style="list-style-type: none"> 1. cooking decreases all the vitamins / eq ; 2. reference to only zinc does not change / eq ; 3. biggest decrease is in Vitamin A ; 4. credit manipulation of figures with units (if appropriate) to compare raw and cooked ; 	(3)
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(b) QWC	<p>(QWC - Spelling of technical terms must be correct and the answer must be organised in a logical sequence)</p> <ol style="list-style-type: none"> 1. idea that some carrots need to be boiled in water and some cooked in microwave ; 2. reference to control of appropriate variable; 3. reference to {juice / cooking water} being used ; 4. reference to DCPIP ; 5. {reference to titration / description of titration} (of juice) ; 6. colour change of DCPIP e.g. from blue to {colourless / pink} as juice added / until stays blue as DCPIP added ; 7. reference to {comparison of volumes of DCPIP added to each / use of calibration curve / calculation of vitamin C concentration against known vitamin C solution} ; 8. reference to repeats ; 	(5)
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6)

<ol style="list-style-type: none"> 1. (double) helix ; 2. deoxyribose ; 3. phosphate / phosphate group; 4. phosphodiester / phospho(di)ester / covalent ; 5. thymine ; 6. guanine ; 7. hydrogen ; 8. sixteen / 16 ; 	(8)
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7)

(a)QWC	<p>(QWC - Spelling of technical terms (<i>shown in italics</i>) must be correct and the answer must be organised in a logical sequence)</p> <ol style="list-style-type: none"> 1. appropriate tissue named e.g. beetroot ; 2. reference to {washing / soaking} {beetroot / eq} (thoroughly) ; 3. reference to waterbath (to maintain / change temperature) ; 4. reference to {range / at least 5} {temperatures / alcohol concentrations} ; 5. appropriate controlled variable named e.g. length of time, size of beetroot ; 6. indication of what is being used to judge permeability colour of solution, absorbance, transmission ; 7. description of how permeability can be assessed e.g. use of colorimeter, standard solutions ; 8. reference to repeats / replicates ; 	<p>max (5)</p>
(b)(i)	<p>no {relationship / correlation} eq ;</p>	<p>(1)</p>
(b)(ii)	<p>permeability of cell membrane increases as the solubility (in oil relative to water) increases / eq ;</p>	<p>(1)</p>
(b)(iii)	<ol style="list-style-type: none"> 1. circle drawn in top left quarter of graph ; 2. {circle/dot} drawn is equal to or smaller than smallest printed circle, e.g. fits within one square ; 	<p>(2)</p>

(b)(iv)	<ol style="list-style-type: none"> 1. reference to phospholipid bilayer ; 2. reference to hydrophobic nature (of bilayer / tails) ; 3. idea that {non-polar molecules / molecules that have high solubility in oil compared with water} will pass through the membrane more readily OR idea that {polar molecules / molecules with low solubility in oil relative to water} will pass through less readily ; 4. idea that permeability linked to readiness to dissolve ; 5. reference to {fluidity / movement} of phospholipids ; 	<p>max (3)</p>
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