

1)

(a)	(i)	budding ;	1	<p>Mark the first answer. If the answer is correct and an additional answer is given that is incorrect or contradicts the correct answer then = 0 marks</p> <p>IGNORE mitosis / asexual</p>
	(ii)	<p>mitosis ;</p> <p>swelling / bulge, in (surface of) the cell ;</p> <p>nucleus moves into, swelling / bulge / bud ;</p> <p>idea that, bulge / bud, nips / pinches / breaks off / cleaves ;</p> <p>ref to uneven distribution of cytoplasm ;</p>	2 max	<p>Ensure this is in context of before nucleus moves into bud</p> <p>IGNORE bud / growth</p> <p>IGNORE DNA / genetic material</p> <p>IGNORE 'separates' / 'detaches'</p>
(b)	(i)	35 / 36 ; ;	2	<p>Correct answer = 2 marks</p> <p>If not whole number e.g. 35.79 or 35.8 = 1 mark</p> <p>If answer incorrect allow one mark for seeing: $4 \times 3.14 \times 1.5^2 \div 3.14 \times 0.5^2$</p> <p>OR $4 \times 1.5^2 \div 0.5^2$</p> <p>OR $4 \times 2.25 \div 0.25$</p> <p>OR</p> $\frac{4 \times 3.14 \times 2.25}{3.14 \times 0.25}$

	(ii)	<p>new bud cannot occur, on / close to, old scar ;</p> <p>not enough space between scars for another bud ;</p> <p>yeast cell not a true sphere ;</p> <p>(gene) mutation / DNA damage ;</p>	1 max	<p>CREDIT idea that some of surface between scars is not used / ref to unable to tessellate / scars not closely packed</p> <p>IGNORE 'covered in scars' OR ref to scar size</p> <p>IGNORE ref to chromosome numbers</p>
(c)		<p>(cells) differentiate(d) / specialise(d) ;</p> <p>(groups of) cells form tissue(s) ;</p> <p>(groups of) tissues form organ(s) ;</p> <p>(groups of organs) form organ system(s) ;</p> <p>(group of) cells / tissues / organs / organ systems, work together / interact ;</p> <p>named example of a tissue / an organ /an organ system ;</p> <p>QWC ;</p>	4 max	<p>IGNORE 'system' alone</p> <p>ACCEPT same job / same task / same function</p> <p>It should be clear whether they are naming a tissue, an organ or a system</p> <p>NOTE e.g. cells work together to form tissues = 2 marks (mp2 and 5)</p> <p>1 two terms used appropriately and spelled correctly</p> <p>ACCEPT correct derivations of these terms: differentiate, specialise / specialize, tissue, organ, organ system</p>
			Total	11

2)

(a)			cell type			4	<p>Allow one mark for each correct row. DO NOT CREDIT 'hybrid' ticks or crosses</p> <p>NB each row must have 3 correctly completed boxes</p>
	feature	plant cell	animal cell	bacterial cell			
	mitochondria	✓	✓	x			
	chloroplasts	✓	x	x			
	cellulose cell wall	✓	x	x			
	centrioles	x	✓	x			
ribosomes	✓	✓	✓				
(b)	(i)	1 ; 4 ; 2 ; 2 ;			4	<p>Mark the first answer on each prompt line. If the answer is correct and an additional answer is given that is incorrect or contradicts the correct answer then = 0 marks</p>	
	(ii)	ribosome(s) ;			1	IGNORE 'tube number'	
Total					9		

4)

(a)		<p>globular ; catalysts ;</p> <p>intracellular ; extracellular / hydrolytic ;</p> <p>inhibitors ;</p>			5	<p>Mark the first answer on each prompt line. If the answer is correct and an additional answer is given that is incorrect or contradicts the correct answer then = 0 marks</p> <p>DO NOT CREDIT metabolic (as given in Q) DO NOT CREDIT digestive (as given in Q)</p>
(b)		<p>1 carry out with and without , Ca^{2+} / cofactor ;</p> <p>2 <i>idea of using at least three concentrations</i> (of Ca^{2+}) (other than zero) ;</p> <p>3 keep , concentration / volume of , enzyme / rennin, constant ;</p> <p>4 keep , concentration / volume of , caseinogen / substrate / milk, constant ;</p> <p>5 keep , temperature / pH , constant ;</p> <p>6 measure / AW , appearance of , product / casein or measure disappearance of , substrate / caseinogens or assess cloudiness (of solution) ;</p> <p>7 over time intervals / after fixed time / end point time ;</p> <p>8 replicates / repeats ;</p>			5	<p>1 ACCEPT 'use a control with no calcium' 1 ACCEPT calcium as AW for Ca^{2+} as the question is testing AO3 1 IGNORE increase / decrease , concentration</p> <p>2 ACCEPT implication of 3 or more concentrations, e.g. 'use several concentrations'</p> <p>3 IGNORE amount</p> <p>4 IGNORE amount</p> <p>5 IGNORE 'use a water bath' unqualified</p> <p>6 This mp is for measurement of the dependent variable 6 ACCEPT observe as AW for measure appearance disappearance 6 ACCEPT filter and weigh 6 ACCEPT 'assess degree of solubility / insolubility'</p> <p>7 'measure how much substrate is left after 30 min' = 2 marks (mp 6 and 7)</p> <p>8 IGNORE repeat / replicate on its own – must imply minimum of 3 in total, i.e. original plus two</p>
(c)		<p>1 <i>idea of cofactors / minerals</i> , being , recycled / used again ;</p> <p>2 <i>idea that in enzyme action</i> total mass of , cofactor / coenzyme , very small compared to total mass of protein ;</p> <p>3 <i>idea that</i> proteins are used for purposes other than enzymes ;</p> <p>4 proteins are not stored in the body but vitamins and minerals are ;</p> <p>5 some enzymes don't need cofactors ;</p>			1	<p>2 AWARD only if the enzyme context is clearly stated</p> <p>3 CREDIT stated example, e.g. muscle / hormones / antibodies. 3 IGNORE growth / repair / replace</p>
Total					11	

5)

(a)	<p>(contains) <u>all of the / every / each</u>, nutrient(s) / food groups / components / constituents</p> <p>or</p> <p>(contains the), nutrients / food groups / components / constituents, <u>needed for health</u></p> <p>or</p> <p>(contains) fat and protein and carbohydrate and minerals and vitamins (and , fibre / roughage , and water) ;</p> <p>in correct / right / suitable, proportions / amount / quantity / level ;</p>	2	<p>IGNORE factors / things , as AW for nutrients</p> <p>IGNORE refs to energy</p> <p>IGNORE 'adequate / sufficient / enough' as this implies minimum</p> <p>IGNORE 'balanced' as this is part of the term they are defining</p> <p>IGNORE 'match consumption with use'</p>
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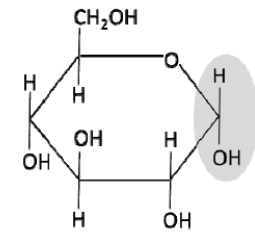
(b)	(i)	<p>1 membranes ;</p> <p>2 absorption of fat soluble vitamins ;</p> <p>3 electrical <u>insulation</u> / <u>insulation</u> of , neurones / nerve cells / axons ;</p> <p>4 (thermal) <u>insulation</u> ;</p> <p>5 protection of organs ;</p> <p>6 (source of) (steroid) hormones / named steroid hormone / named group of steroid hormones ;</p> <p>7 (source of) cholesterol / LDL / HDL ;</p> <p>8 waterproofing / skin suppleness / sebum ;</p> <p>9 source of vitamin D ;</p> <p>10 buoyancy ;</p>	3	<p>Mark the first answer on each prompt line. If the answer is correct and an additional answer is given that is incorrect or contradicts the correct answer then = 0 marks</p> <p>IGNORE 'energy source'</p> <p>1 ACCEPT 'phospholipid bilayer'</p> <p>3 ACCEPT insulation in context of myelin / Schwann cells</p> <p>4 IGNORE refs to thermoregulation</p> <p>5 IGNORE 'protect cells / padding'</p> <p>6 e.g. testosterone, oestrogen, progesterone, aldosterone , glucocorticoids, androgens</p> <p>8 ACCEPT ear wax</p>
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CHERRY HILL TUITION OCR BIOLOGY AS PAPER 3 MARK SCHEME (U1JA13/2/3/5-U2JA13/3/4/6)

(b)	(ii)	<p>1 (leads to) increased / AW , cholesterol / LDL ;</p> <p>2 cholesterol / fat , deposited , <u>in</u> arterial walls / <u>under</u> endothelium ;</p> <p>3 increase risk of / leads to , <u>ath</u>erosclerosis / <u>ather</u>oma / plaque formation ;</p> <p>4 narrowing / blocking , of artery <u>lumen</u> ;</p> <p>5 increased risk of / leads to , CHD / angina / stroke / hypertension / high blood pressure / heart attack / myocardial infarction / gallstones ;</p>	3	<p>1 IGNORE 'low density lipid'</p> <p>1 IGNORE cholesterol unqualified. Answers must imply that the level of cholesterol (in the body) is raised</p> <p>2 ACCEPT 'LDL deposited in arterial wall'</p> <p>2 ACCEPT epithelium / lining , as AW for endothelium</p> <p>3 ACCEPT 'causes atherosclerosis'</p> <p>4 ACCEPT 'sticking out into artery lumen'</p> <p>5 DO NOT CREDIT if candidates think the C stands for 'chronic'</p> <p>5 ACCEPT mis-spellings of 'coronary' which cannot be confused with chronic</p> <p>5 ACCEPT 'causes heart disease'</p> <p>5 IGNORE diabetes / arthritis as directly related to obesity</p>																																
(c)		<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>triglyceride</th> <th>phospholipid</th> <th></th> </tr> </thead> <tbody> <tr> <td>difference</td> <td>3 fatty acids</td> <td>2 fatty acids</td> <td>;</td> </tr> <tr> <td>difference</td> <td>3 ester bonds</td> <td>2 ester bonds</td> <td>;</td> </tr> <tr> <td>difference</td> <td>absence of phosphate</td> <td>presence of phosphate</td> <td>;</td> </tr> <tr> <td>similarity</td> <td colspan="2">(contain) glycerol</td> <td>;</td> </tr> <tr> <td>similarity</td> <td colspan="2">(contain) fatty acids</td> <td>;</td> </tr> <tr> <td>similarity</td> <td colspan="2">(contain) ester bonds</td> <td>;</td> </tr> <tr> <td>similarity</td> <td colspan="2">(contain elements) C,H and O</td> <td>;</td> </tr> </tbody> </table>		triglyceride	phospholipid		difference	3 fatty acids	2 fatty acids	;	difference	3 ester bonds	2 ester bonds	;	difference	absence of phosphate	presence of phosphate	;	similarity	(contain) glycerol		;	similarity	(contain) fatty acids		;	similarity	(contain) ester bonds		;	similarity	(contain elements) C,H and O		;	4	<p>Award one mark per correct row. CREDIT any correct (pair of) statement(s) in each row regardless of other information</p> <p>2 max for differences</p> <p>2 max for similarities</p> <p>IGNORE molecule / group</p> <p>IGNORE 'hydrocarbon / hydrophobic / lipid , tail' the first time it is seen but ECF if used as a synonym for 'fatty acid' in both difference and similarity</p> <p>IGNORE molecule / group</p> <p>DO NOT CREDIT if an incorrect element stated</p> <p>ACCEPT 'C, H and O atom'</p> <p>DO NOT CREDIT molecule / group</p>
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(d)	(i)	<p>emulsion (test) ;</p>	1	<p>ACCEPT 'emulsification / white emulsion / Sudan III'</p> <p>IGNORE refs to translucent grease mark test'</p>																																
(d)	(ii)	<p><i>emulsion test</i></p> <p>1 add , ethanol / alcohol , (to sample) ;</p> <p>2 shake / stir / agitate / mix thoroughly / AW ;</p> <p>3 add (to) water ;</p> <p><i>If candidate is clearly describing Sudan III test</i></p> <p>5 mix sample with water ;</p> <p>6 add Sudan III (stain) ;</p> <p>7 shake / stir / agitate / mix thoroughly / AW ;</p> <p><i>If candidate is describing translucent grease mark test</i></p> <p>AWARD one mark only ;</p>	3	<p>Max 2 if step 1,2,3 are in different sense order but IGNORE any ref to shaking after adding water, i.e. 1, 2, 3, 2.</p> <p>2 IGNORE 'mix' unqualified</p> <p>2 not dependent on correct chemical in mp 1</p> <p>3 not dependent on correct chemical in mp 1</p>																																
(d)	(iii)	<p>(mixture) turns, cloudy / milky / white ;</p>	1	<p>DO NOT CREDIT 'precipitate'</p> <p>ACCEPT 'red layer floating to top' if Sudan III test has been described in part (ii)</p> <p>ACCEPT 'translucent stain is permanent / AW'</p>																																
Total			17																																	

6)

CHERRY HILL TUITION OCR BIOLOGY AS PAPER 3 MARK SCHEME (U1JA13/2/3/5-U2JA13/3/4/6)

(a)		monosaccharide(s) ;	1	ACCEPT phonetic spelling
(b)	(i)	<p>identical to diagram of β-glucose with inversion of OH and H on any one carbon atom ;</p> <p>correct inversion of OH and H on 1st C ;</p>	2	<p>A correct diagram as shown below = 2 marks</p>  <p>ACCEPT displayed formula for CH₂OH etc If the candidate has drawn α-glucose upside down = 0 marks</p>
(b)	(ii)	<p>1 soluble so can be (easily) , transported / carried (around organism) ;</p> <p>2 small (molecule) so can , be transported / diffuse , across (cell) membranes ;</p> <p>3 <u>easily / quickly</u> , respired / oxidised / broken down , to , release energy / produce ATP ;</p> <p>4 molecules can , <u>join / AW</u> , to produce , (named) disaccharides / (named) polysaccharides ;</p>	2	<p>Answers need a feature plus an explanation of how the feature helps the function</p> <p>1 ACCEPT soluble so is able to , react / AW 1 ACCEPT description of solubility in terms of chemical properties linked to transport or reactivity</p> <p>3 DO NOT CREDIT 'hydrolysed' 3 DO NOT CREDIT 'easily broken down to provide energy for respiration' 3 DO NOT CREDIT 'easily broken down to produce energy'</p> <p>4 IGNORE 'used to form glycogen' without idea of molecules , bonding / joining / condensation</p>
(c)		<p>1 part of nucleotide ;</p> <p>2 bonded / joined / attached , to (named) base and phosphate ;</p> <p>3 phosphate (joined) to C5 (and C3) / base (joined) to C1 ;</p> <p>4 (deoxyribose is part of) backbone (of DNA) ;</p> <p>5 <i>idea of linking with</i> (second) phosphate on adjacent nucleotide ;</p> <p>6 nucleotide is , monomer / repeating unit , of DNA / polynucleotide ;</p>	3	<p>AWARD making points from suitably labelled diagram</p> <p>2 IGNORE 'made up of' 2 DO NOT CREDIT answers which state incorrect bond 2 IGNORE 'phosphate molecule'</p> <p>6 ACCEPT 'DNA formed from a chain of nucleotides'</p>
(d)	(i)	<p>1 α-glucose / β-glucose ;</p> <p>2 some / no , 1–6 bonds</p> <p>or</p> <p><u>only</u> 1–4 bonds ;</p> <p>3 condensation / hydrolysis ;</p> <p>4 branches / straight chain ;</p>	3	<p>Mark the first answer on each prompt line. If the answer is correct and an additional answer is given that is incorrect or contradicts the correct answer then = 0 marks</p> <p>Candidates may identify the error or correct the error If nothing is written on the answer lines, ACCEPT a clear indication on the boxed list of which statements are incorrect</p> <p>1 ACCEPT b / B for 'β'</p>
(d)	(ii)	glycogen / amylopectin ;	1	<p>Mark the first answer. If the answer is correct and an additional answer is given that is incorrect or contradicts the correct answer then = 0 marks</p> <p>IGNORE starch DO NOT CREDIT if spelling could be confused with another molecule, e.g. glucagon</p>
Total			12	