

- 1.a) B (1)
- 1.b) C (1)
- 1.c) D (1)
- 1.d) B (1)
- 1.e) B (1)
- 1.f) C (1)

<b>(g)</b>	<p><b>mRNA</b></p> <ol style="list-style-type: none"> <li>1. idea of mRNA being a copy of the { antisense DNA strand / template DNA strand / coding DNA strand / gene / allele / part of DNA / eq } ;</li> <li>2. idea that mRNA {made up of codons / codes for specific amino acids / code for amino acid sequence / eq} ;</li> <li>3. idea of mRNA being taken {into the cytoplasm / to the ribosomes / out of the nucleus / eq} ;</li> <li>4. used in translation ;</li> <li>5. binds to ribosome ;</li> </ol> <p><b>tRNA</b></p> <ol style="list-style-type: none"> <li>6. (tRNA) {attaches to / transports / eq } (specific) amino acid / eq ;</li> <li>7. idea that tRNA binds to mRNA / reference to anticodon codon interaction ;</li> <li>8. idea that two tRNA bring amino acids together (for peptide bonds to be formed) ;</li> </ol>	<b>(4)</b>
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2)		
<b>a)(i)</b>	<ol style="list-style-type: none"> <li>1. no {amino / amine / NH<sub>2</sub> / NH<sub>3</sub><sup>+</sup> } group ;</li> <li>2. no {carboxyl / carboxylic acid / COOH / COO<sup>-</sup> } group ;</li> <li>3. no {central / alpha} carbon (atom) / eq ;</li> <li>4. no {R / residual} group(s) ;</li> <li>5. ring structures present (amino acids only have them in some R groups) / eq ;</li> </ol>	<b>(2)</b>

<b>a)(ii)</b>	<ol style="list-style-type: none"> <li>1. idea that position of CH<sub>3</sub> different ;</li> <li>2. idea that position of {H / NH/ N-H} different ;</li> <li>3. reference to being isomerically different ;</li> </ol>	<b>(2)</b>
<b>a)(iii)</b>	<ol style="list-style-type: none"> <li>1. idea of specificity of {active site/enzyme} ;</li> <li>2. idea that the products are different {shapes / structures} ;</li> <li>3. idea that P450 consists of (at least) three {enzymes / active sites} ;</li> <li>4. idea that products could be interconverted ;</li> </ol>	<b>(3)</b>
<b>(b)</b>	<p><b>Conclusion 1:</b></p> <ol style="list-style-type: none"> <li>1. idea that the first conclusion is {valid for some of the data / not valid (for all data) / misleading /eq} ;</li> <li>2. coffee and hot chocolate do have different concentrations</li> </ol> <p><b>OR</b> only 4 drinks tested / concentration not measured / volumes not controlled / eq ;</p> <p><b>Conclusion 2:</b></p> <ol style="list-style-type: none"> <li>3. idea that the second conclusion is not valid ;</li> <li>4. no indication of the volumes of tea and cola / volume not controlled / impossible to calculate concentration of caffeine in all four drinks (using information given) / eq ;</li> </ol>	<b>(3)</b>

3)

<b>(a)</b>	<ol style="list-style-type: none"> <li>1. idea that DNA (molecule){ unwinds / unzips / uncoils / eq} (DNA) strands separate ;</li> <li>2. (RNA mono) nucleotides {line up against / attach to} {one strand / template / antisense strand / eq} / eq ;</li> <li>3. ref to complementary base pairing (between DNA and mononucleotides) ;</li> <li>4. ref to formation of phosphodiester bonds ;</li> <li>5. ref to condensation reaction ;</li> <li>6. correct name of enzyme involved ;</li> <li>7. idea that mRNA detaches from the DNA;</li> </ol>	<ol style="list-style-type: none"> <li>1. ALLOW description e.g. breaking of hydrogen bonds</li> <li>2. NOT DNA strands, DNA nucleotides</li> <li>3. ALLOW description of complementary base pairing</li> <li>6. (DNA) helicase, RNA polymerase, DNA ligase NOT DNA polymerase, polymerase</li> <li>7. NOT leaves nucleus alone / eq</li> </ol>	<b>(4)</b>
<b>b)(i)</b>	B ;	<b>(1)</b>	
<b>b)(ii)</b>	B ;	<b>(1)</b>	
<b>b)(iii)</b>	D ;	<b>(1)</b>	
<b>(c)</b>	<ol style="list-style-type: none"> <li>1. tRNA is folded (and mRNA is {straight / unfolded}) / eq ;</li> <li>2. tRNA has hydrogen bonds (holding the structure together) (but the mRNA does not / eq) ;</li> <li>3. tRNA is a fixed {size / length} (but mRNA {is not / length depends on size of gene}) / eq ;</li> <li>4. tRNA has an anticodon (but mRNA has codons) ;</li> <li>5. tRNA has an amino acid binding site ;</li> </ol>	<ol style="list-style-type: none"> <li>1. IGNORE double stranded / branched ALLOW tRNA clover shaped / looped</li> <li>2. ALLOW tRNA has complementary base pairing / double stranded sections NOT (all) double stranded</li> <li>4. NOT is an anticodon</li> </ol>	<b>(2)</b>

4)

<b>(a)</b>	<ol style="list-style-type: none"> <li>1. phospholipid (bilayer) ;</li> <li>2. credit details of phospholipid bilayer ;</li> <li>3. proteins ;</li> <li>4. credit details of proteins ;</li> <li>5. reference to other named membrane components ;</li> </ol>	<p>ALLOW a clearly labelled diagram</p> <ol style="list-style-type: none"> <li>2. e.g orientation because of hydrophobic and/or hydrophilic regions eg phospholipids are fluid</li> <li>4. e.g. description of channel/carrier protein structure or position. (Intrinsic, extrinsic or transmembrane)</li> <li>5.e.g. glycolipid, cholesterol, glycoprotein, carbohydrate chain, glycocalyx</li> </ol>	<b>(3)</b>
<b>(b)(i)</b>	<p><b>Solute P:</b></p> <ol style="list-style-type: none"> <li>1. (up to 30 minutes) the {concentration / number} of molecules of P increases inside the cell / eq ;</li> <li>2. ref to {diffusion / facilitated diffusion}(of molecules of P into the cell) ;</li> <li>3. down the concentration gradient (of P) / eq ;</li> <li>4. {between 30 and 40 minutes / after 30 minutes } the {concentration / number} of molecules (of P) inside the cell stays the same / eq ;</li> <li>5. concentration (of P) inside cell equals concentration outside cell / reaches equilibrium / eq ;</li> </ol> <p><b>Solute R:</b></p> <ol style="list-style-type: none"> <li>6. solute R does not enter cell / eq ;</li> <li>7. membrane is impermeable to R ;</li> </ol>	<p>IGNORE amount</p> <p><b>max 4 marks for solute P</b></p> <ol style="list-style-type: none"> <li>2. NOT osmosis</li> <li>3. ALLOW high to low concentration NOT high to low concentration gradient</li> <li>4. ALLOW no net movement</li> </ol>	<b>(5)</b>
<b>b)(ii)</b>	<p>six white circles inside and outside the cell and 4 black circles outside cell ;</p>	<b>(1)</b>	

5)

<b>(a)</b>	<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"> <li>1. (a) <i>glucose</i> ;</li> <li>2. <i>glycosidic</i> {bonds / links} ;</li> <li>3. <i>amylose</i> and <i>amylopectin</i> ;</li> <li>4. <i>amylose</i> has 1- 4 (<i>glycosidic</i>) {bonds / links}</li> </ol> <p><b>AND</b> <i>amylopectin</i> has 1- 4 and 1- 6 (glycosidic) bonds / eq ;</p> <ol style="list-style-type: none"> <li>5. <i>amylose</i> is {spiralled / coiled} ;</li> <li>6. <i>amylopectin</i> is branched / eq ;</li> <li>7. compact <i>molecule</i> / eq ;</li> </ol>	<p>QWC spelling of words in italics should be correct. Penalise just once – ALLOW max score of 5 if 6 mpts met but one lost due to spelling mistake.</p>	<b>(5)</b>
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<b>(b)(i)</b>	<ol style="list-style-type: none"> <li>1. speeds up the rate of reaction / eq ;</li> <li>2. without being {changed/used up / eq} ;</li> <li>3. lowers activation energy / provides an alternative reaction pathway / eq ;</li> <li>4. does not change {products / position of equilibrium / eq} / eq ;</li> </ol>		<b>(2)</b>
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<b>(b)(ii)</b>	<ol style="list-style-type: none"> <li>1. breaks the (glycosidic) bonds / eq ;</li> <li>2. reference to use of water ;</li> </ol>	<ol style="list-style-type: none"> <li>1. IGNORE hydrogen bonds</li> <li>2. NOT makes water / eq</li> </ol>	<b>(2)</b>
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<b>(c)</b>	<p>idea that { maltose / disaccharide / glucose / monosaccharide} {is produced / tastes sweet} ;</p>	<p>ALLOW dextrins / sugar NOT any other named sugar eg sucrose</p>	<b>(1)</b>
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6)			
a)(i)	<ol style="list-style-type: none"> <li>reference to {H on the N / NH} in the reduced DCPIP ;</li> <li>reference to more {H on the O / OH / hydroxyl} in the reduced DCPIP ;</li> <li>more Hs in the reduced DCPIP / eq ;</li> <li>idea of double bonds different in {number / location /eq} e.g. fewer in reduced DCPIP ;</li> <li>idea of CN double bond not present in reduced ;</li> <li>idea of CO double bond not present in reduced ;</li> </ol>	<p>IGNORE hydrogen bonds ACCEPT converse for oxidised DCPIP ACCEPT a clear statement about one implies a difference</p> <ol style="list-style-type: none"> <li>e.g. two OH groups in reduced form ACCEPT alcohol groups</li> <li>NOT more than two more Hs</li> <li>IGNORE reduced more saturated</li> </ol> <p>6. ACCEPT ref to ketone group</p>	(2)
a)(ii)	idea that the Hs come from the vitamin C / idea that vitamin C acts as a reducing agent ;	<p>ACCEPT Description in terms of electrons (Vit C loses electrons/DCPIP gains electrons) ACCEPT vitamin C is oxidised ACCEPT vitamin C reduces DCPIP DCPIP is reduced alone is not enough</p>	(1)
b)(i)	<ol style="list-style-type: none"> <li>pH increases during storage (over 4 days) / eq ;</li> <li>greatest increase in pH at 12°C / smallest increase in pH at 24°C / eq ;</li> <li>idea that pH changes are similar at 6 °C and 8 °C ;</li> <li>reference to slight decrease in pH during first {one / two} days at 24 °C ;</li> <li>credit correct manipulation of figures for a time period;</li> </ol>	<p>ACCEPT reduction in acidity for increase in pH</p> <ol style="list-style-type: none"> <li>ACCEPT for all or for any one temperature</li> <li>ACCEPT 12°C highest pH</li> <li>ACCEPT the same up to day 2</li> <li>Assume value is for four days unless otherwise stated, as four days specified in question stem. E.g. 12°C increased 0.45 / 12°C 0.4 higher than 24°C / only 0.03 between 6 °C and 8 °C (after 4 days)</li> </ol>	(3)
b)(ii) 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"> <li>idea of using juice (from stored fruits) ;</li> <li>reference to {titration / eq} (of juice) ;</li> <li>correct colour change described ;</li> <li>compare volumes of {juice / DCPIP} used ;</li> <li>use of {repeats / replicates / eq} ;</li> <li>reference to extended storage ;</li> </ol>	<p>QWC points must be clear and unambiguous for awarding</p> <ol style="list-style-type: none"> <li>NOT storing the juice</li> <li>can be described or named</li> <li>must be checked for context e.g. blue to colourless / clear / pink when titrating juice into the DCPIP, colourless to blue if DCPIP to juice. ACCEPT suitable description of use of colourimeter</li> <li>ACCEPT in context of calibration of DCPIP against a standard concentration of vitamin C.</li> </ol>	(5)
7)			
a)	<ol style="list-style-type: none"> <li>{phosphate group / heads} are hydrophilic ;</li> <li>Idea that heads can be attracted to water ;</li> <li>{fatty acids / tails} are hydrophobic ;</li> <li>Idea that tails orientate themselves away from water / eq ;</li> <li>Idea of aqueous environment on both sides of the membrane ;</li> </ol>	<p>ACCEPT marks for annotated diagram, phonetic spelling OK IGNORE "water loving / hating"</p> <ol style="list-style-type: none"> <li>ACCEPT polar</li> <li>not just facing water</li> <li>ACCEPT non polar</li> <li>ACCEPT repel water, face away from water, away from polar environment</li> <li>ACCEPT polar environment</li> </ol>	(3)
b)	B ; C ; A ;		(3)

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(c)(i)	<ol style="list-style-type: none"> <li>both have a phospholipid bilayer and protein / eq ;</li> <li>idea that the fluid mosaic model has {proteins within the phospholipid layer / protein channels } while the Davison – Danielli model has protein layer on the outside of the membrane only ;</li> <li>reference to other components present in fluid mosaic model e.g. glycolipid, glycoprotein, cholesterol ;</li> </ol>	<ol style="list-style-type: none"> <li>ACCEPT point pieced together in response</li> <li>needs clear comparative statement re the position of the proteins in the two models, but can be expressed in a number of ways.</li> </ol> <p style="text-align: right;"><b>(2)</b></p>	
(c)(ii)	<ol style="list-style-type: none"> <li>idea that molecules would not be able to diffuse through the (two) protein layers / eq ;</li> <li>idea of no {channels / carriers / protein } for {facilitated diffusion / active transport / osmosis} ;</li> <li>comment on fluidity of membrane / limits fusion of vesicles /eq ;</li> </ol>	<ol style="list-style-type: none"> <li>ACCEPT osmosis in context of water passing through protein layer</li> <li>ACCEPT pumps for active transport</li> <li>ACCEPT endo/exocytosis</li> </ol>	<p style="text-align: right;"><b>(2)</b></p>