CAMBRIDGE
International Education

Cambridge International AS & A Level

BIOLOGY **9700/24**

Paper 2 AS Level Structured Questions **May/June 2026**

MARK SCHEME

Maximum Mark: 60

Published

This mark scheme contains the instructions and marking guidance that our examiners used to mark candidate responses for this component.

Before they start marking, examiners complete a standardisation process. They review a range of candidate responses and discuss the mark scheme in detail to agree which answers can and cannot be accepted. Examiners award marks where it is clear that candidate responses have met the requirements of the mark scheme. These requirements may vary between different components or different versions of the same component, depending on the exact requirements of the question and the candidate responses seen during the standardisation process.

Sometimes, our mark schemes may allow marks to be awarded to responses which contain elements that are factually incorrect or for content not covered by the syllabus. We do this in response to the demands of a specific question to support candidates and make sure that our assessments are fair. However, these allowances should not be used as a guide for teaching and learning.

We cannot discuss the mark scheme with schools, and we recommend that schools read the mark scheme together with the assessment material and the Principal Examiner Report for Teachers.

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General marking principles

All examiners must apply these marking principles when marking candidate responses.

1	Examiners must award marks for each response in line with: • the specific **content** defined in the mark scheme • the specific **skills** defined in the mark scheme or in the level descriptions • the **standard of response** required as exemplified by the standardisation scripts.
2	Examiners must award **whole marks** (not half marks, or other fractions).
3	Examiners must award marks **positively**. This means that: • marks are not deducted for errors or omissions • marks are awarded for correct/valid answers as defined in the mark scheme and also for **other valid answers** which go beyond the scope of the syllabus and mark scheme referring to your team leader as appropriate • the quality of spelling, punctuation and grammar are judged **only** when the mark scheme indicates that these features are **specifically assessed** in the question. However, the meaning of all responses must be unambiguous.
4	Examiners must **consistently** apply the requirements of the mark scheme and any rules for what to do when candidates have not followed instructions correctly.
5	Examiners must use the **full range of marks** defined in the mark scheme, unless limited by the quality of the candidate responses seen.
6	Examiners must award marks according to the mark scheme and **must not** award marks with grade thresholds or grade descriptions in mind.

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Science-Specific Marking Principles

1	Examiners should consider the context and scientific use of any keywords when awarding marks. Although keywords may be present, marks should not be awarded if the keywords are used incorrectly.
2	The examiner should not choose between contradictory statements given in the same question part, and credit should not be awarded for any correct statement that is contradicted within the same question part. Wrong science that is irrelevant to the question should be ignored.
3	Although spellings do not have to be correct, spellings of syllabus terms must allow for clear and unambiguous separation from other syllabus terms with which they may be confused (e.g. ethane / ethene, glucagon / glycogen, refraction / reflection).
4	The error carried forward (ecf) principle should be applied, where appropriate. If an incorrect answer is subsequently used in a scientifically correct way, the candidate should be awarded these subsequent marking points. Further guidance will be included in the mark scheme where necessary and any exceptions to this general principle will be noted.
5	'List rule' guidance For questions that require ***n*** responses (e.g. State **two** reasons …): • The response should be read as continuous prose, even when numbered answer spaces are provided. • Any response marked *ignore* in the mark scheme should not count towards ***n***. • Incorrect responses should not be awarded credit but will still count towards ***n***. • Read the entire response to check for any responses that contradict those that would otherwise be credited. Credit should **not** be awarded for any responses that are contradicted within the rest of the response. Where two responses contradict one another, this should be treated as a single incorrect response. • Non-contradictory responses after the first ***n*** responses may be ignored even if they include incorrect science.

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6 Calculation specific guidance

Correct answers to calculations should be given full credit even if there is no working or incorrect working, **unless** the question states 'show your working'.

For questions in which the number of significant figures required is not stated, credit should be awarded for correct answers when rounded by the examiner to the number of significant figures given in the mark scheme. This may not apply to measured values.

For answers given in standard form (e.g. $a \times 10^n$) in which the convention of restricting the value of the coefficient (a) to a value between 1 and 10 is not followed, credit may still be awarded if the answer can be converted to the answer given in the mark scheme.

Unless a separate mark is given for a unit, a missing or incorrect unit will normally mean that the final calculation mark is not awarded. Exceptions to this general principle will be noted in the mark scheme.

7 Guidance for chemical equations

Multiples / fractions of coefficients used in chemical equations are acceptable unless stated otherwise in the mark scheme.

State symbols given in an equation should be ignored unless asked for in the question or stated otherwise in the mark scheme.

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Annotations guidance for centres

Examiners use a system of annotations as a shorthand for communicating their marking decisions to one another. Examiners are trained during the standardisation process on how and when to use annotations. The purpose of annotations is to inform the standardisation and monitoring processes and guide the supervising examiners when they are checking the work of examiners within their team. The meaning of annotations and how they are used is specific to each component and is understood by all examiners who mark the component.

We publish annotations in our mark schemes to help centres understand the annotations they may see on copies of scripts. Note that there may not be a direct correlation between the number of annotations on a script and the mark awarded. Similarly, the use of an annotation may not be an indication of the quality of the response.

The annotations listed below were available to examiners marking this component in this series.

Annotations

Annotation	Meaning
	correct point or mark awarded
	correct awarding one mark from marking point or marking group 1. similar numbered ticks are used for marking point or marking groups 2, 3, 4 etc.
	incorrect point or mark not awarded
	working towards marking point
	information missing or insufficient for credit
	used to highlight part of an extended response
	used to highlight part of an extended response
	allow or accept
	benefit of the doubt given

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Annotation	Meaning
CON	contradiction in response, mark not awarded
ECF	error carried forward applied
I	incorrect or insufficient point ignored while marking the rest of the response
IRRL	irrelevant material that does not answer the question
O	or reverse argument
PAG	point already given
R	incorrect point or mark not awarded
SEEN	point has been noted, but no credit has been given or blank page seen

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Mark scheme abbreviations

;	separates marking points
/	alternative answers for the same point
A	accept (for answers correctly cued by the question, or by extra guidance)
R	reject
I	ignore
( )	the word / phrase in brackets is not required, but sets the context
AW	alternative wording (where responses vary more than usual)
underline	actual word given must be used by candidate (grammatical variants accepted)
max	indicates the maximum number of marks that can be given
ora	or reverse argument
mp	marking point (with relevant number)
ecf	error carried forward
AVP	alternative valid point
bod	allow benefit of doubt

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Question	Answer	Marks
1(a)(i)	*any **two** from:* *idea that,* sister / identical, chromatids need to be present (for mitosis) **;** **A** *ref. to* 'chromatins' *if chromatids noted elsewhere in answer* need to, check for errors / avoid mutations (before progressing to mitosis) **;** **A** cell does not begin mitosis unless S phase checkpoint is passed AW **bod** *ref. to* proofreading (so) daughter cells / cells produced by mitosis, are genetically identical **;** **A** need to provide each daughter cell with same, DNA / chromosomes **A** (so) sister / identical, chromatids can be in separate (daughter) cells **I** so genetically identical to (original) parent cell *idea that,* DNA / chromatin / chromosome, too condensed during, mitosis / prophase (for replication to occur) **; ora** **A** DNA cannot unwind (for replication to occur) AW AVP **;** e.g. DNA inactive during mitosis / no transcription and translation (for histone production) replication takes longer than prophase so cannot occur in mitosis	**2**
1(a)(ii)	DNA polymerase **;** DNA ligase **;** *either order* **R** DNA lyase **A** correct non-syllabus enzymes e.g. helicase / topoisomerase / DNA primase *spellings must be correct* *if no marks gained, allow 1 mark for polymerase and ligase but* **R** *RNA polymerase and ligase*	**2**
1(a)(iii)	S (phase) / G_1 (phase) **; A** S and G_1 (phases) **R** *if G_2 also stated* (proteins) need to be complexed with DNA during, replication / S phase **;** AW *ecf on G2 phase* *e.g. need to be complexed with DNA after, replication / S phase* AVP **;** e.g. (need) histone proteins for DNA /chromosome, coiling / condensation (in mitosis)	**2**

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Question	Answer	Marks
1(b)	**I** *ref. to* large vacuole (not present in dividing plant cells) *any* ***three*** *from:* *look for relevant* ***ora***	**3**

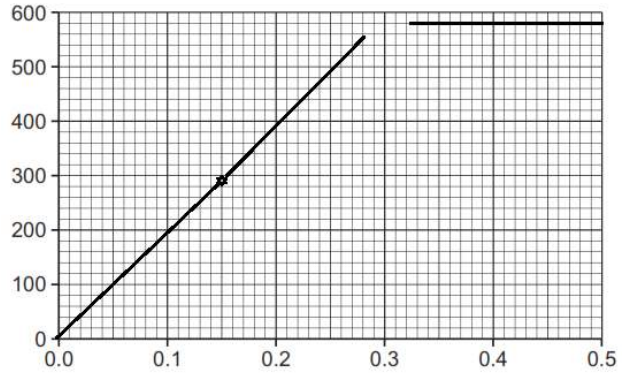
1	no, cell plate / cell wall **;**	**A**
2	cleavage furrow present *accept ref. to contractile ring* **or** cytoplasm / cell (surface) membrane, pinching in / constricting **;**	**A**, **B**, **D**
3	cytokinesis occurring / (cell is in late) telophase **; R** cytokines	**B**, **D**
4	cytoplasm (still), being shared out / dividing / connected **;** AW	**B**, **D**
5	cell (surface) membrane(s) not fully formed (around each cell) **;** **bod** cell membrane(s) is forming (to divide cell)	**B**, **D**
	if mp 4 and 5 not gained allow mark for idea of cells still connected / still a single cell / membranes still connected / not divided completely	
6	*idea of,* cell structures / organelles / cytoplasm, not shared out equally **;** **A** (forming daughter) cells are different sizes	**C**
7	nuclear envelope(s) not yet formed (around chromosomes) **or** (two separate) nuclei not visible / nucleus in each part not visible **;**	**B**, **D**
8	(daughter) chromosomes, (still) visible / (still) condensed / not diffuse **;** **ora**	**D**
9	spindle fibres, (still), visible / present **;**	**D**

Key

Observation 1 — not plant cells = **A**

Observation 2 —
- not two cells = **B**
- not identical = **C**
- not early interphase = **D**

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Question	Answer	Marks
2(a)	extracellular (enzyme) **;**	**1**
2(b)(i)	mmol dm^{-3} **;** *curve drawn, which* starts at 0.0 and passes through at y-axis 290 U cm^{-3} and x-axis 0.15dm^{-3} **and** plateau is at 580 U cm^{-3} **;**  	**2**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>2(b)(ii)</td><td>
can gain max from agree, or disagree, or both
any three from:
agree
Figure 2.1, substrate / cholesterol, concentration
1 can use, known cholesterol concentrations / standards, to produce a calibration curve ;

2 enzyme is active at (substrate) concentrations, tested / over a range / at least to 0.5 mmol dm^{-3} ;

3 suggestion that, low K_m / K_m of 0.15 mmol dm^{-3}, allows enzyme to react with low concentrations / affinity of enzyme to substrate is high ; AW

Figure 2.2, pH
4 enzyme (quite) active, qualified ; e.g.
at a (fairly) wide range of pH
at a number of different pHs
between pH 6 and pH9
in acidic and alkaline conditions in context of pH 6–9
I because most foods are at, optimum pH for enzyme / pH7–8

5 use of data from Figure 2.2 to support ;
ecf on I in mp4 ref. to optimum between pH7 99% and pH8 98%
<table>
<tr><td>pH</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr>
<tr><td>% max</td><td>7</td><td>11</td><td>21</td><td>99</td><td>98</td><td>57</td><td>8</td></tr>
</table>
general
6 AVP ; e.g. bacterial enzyme so, easy / cheap, to obtain
bacterial enzyme so can be obtained in large quantities

disagree
Figure 2.1, substrate / cholesterol, concentration
7 concentrations higher than 0.5 mmol dm^{-3}, not tested ;
</td><td>3</td></tr>
</table>

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>2(b)(ii)</td><td>
8 concentrations higher than 0.5 mmol dm^{-3}, may inhibit activity ;

Figure 2.2, pH
9 enzyme not very active at pHs below / above / either side of optimum / either side of pH 7– pH 8 /9 ; AW
e.g. idea that good enzyme activity limited to, pH 7–8 / pH 7– 8 / 9

10 use of data from Figure 2.2 to support ; use of data once only

<table>
<tr><td>pH</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr>
<tr><td>% max</td><td>7</td><td>11</td><td>21</td><td>99</td><td>98</td><td>57</td><td>8</td></tr>
</table>
11 idea that (many) foods, can have lower or higher pH / are too acidic or alkaline, for enzyme activity needed ;
A basic for alkaline

general
12 AVP ; e.g. temperature used (to obtain results) may not be suitable for food industry testing conditions only shows relative activity so activity at lower pHs may be poor
</td><td></td></tr>
</table>

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Question	Answer	Marks
2(c)	*context can be enzyme on pathogen surface or secreted enzyme* *max 2 if no ref. to entry* *any **three** from:* *context is cell surface membrane of host cell* (membrane) cholesterol, broken down / decreases / AW **;** (membrane) becomes, less stable / more permeable / more fluid **;** *ref. to*, gaps / spaces, created (between phospholipids) for (easier entry of), bacterial cell / *M. tuberculosis* **;** **I** pores easier for / AW, endocytosis of bacteria to occur / endocytotic vesicles with bacteria to form **;** reduces cholesterol content needed to, form / maintain, (cell) membranes **;** transport of substances across membranes affected (because of damage to membrane(s)) **;** **A** example(s) impairs / AW, organelle function (because of damage to membrane(s)) **;** **A** example(s) other example of harm to the cell **;** e.g. products of reaction catalysed by enzyme may be toxic to cell *M. tuberculosis* / AW, releases toxins *M. tuberculosis* / AW, uses host, cell nutrients / respiratory substrates / ATP damages organelle membranes AVP **;** e.g. less cholesterol available for host cell to produce other lipids	**3**

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>2(d)</td><td>
allow AW throughout
allow bacteria / pathogen, for M. tuberculosis
for each mark, needs to have column 1 and column 2

any three from:
<table>
<tr><th>column 1</th><th>column 2</th></tr>
<tr><td>1 slows / stops, enzyme action
A enzyme cannot, bind / breakdown, cholesterol</td><td>(drug) acts as an inhibitor
(competitive / non-competitive) ;
if term not used allow a correct description</td></tr>
<tr><td>2 won’t harm, human cells
A body / tissues / organs</td><td rowspan="2">only acts on pathogen / enzyme not found in human cells
or
works (only) on cholesterol oxidase;</td></tr>
<tr><td>3 processes (in host cell) unaffected</td></tr>
<tr><td>4 immune system more likely to be effective / described</td><td>bacteria, remain outside / not inside / prevented entering, cells ;
bod difficult to enter</td></tr>
<tr><td>5 reduces problems of developing antibiotic resistance
A does not / less likely to, develop resistance to, drug / inhibitor</td><td rowspan="2">can use, instead of / with / fewer, antibiotics
A can just take the drug
or
bacteria susceptible to drug ;
allow this idea if mp1 gained</td></tr>
<tr><td>6 use for, TB caused by drug-resistant bacteria / named e.g. MDR (multi) / XDR (extensively) / TDR (total) / PDR (pan)</td></tr>
</table>
</td><td>3</td></tr>
</table>

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>2(d)</td><td>
<table>
<tr><th>column 1</th><th>column 2</th></tr>
<tr><td>7 prevents, latent TB / dormant TB / M. tuberculosis staying alive in host cells</td><td rowspan="3">prevents entry (to cells) ; AW
bod difficult to enter
if not stated, allow one mark for any two of 7,8,9 in column 1</td></tr>
<tr><td>8 stops, reproduction (in cells) / replication R mitosis
A ref. to binary fission</td></tr>
<tr><td>9 decreases, number of bacteria / chance of transmission
A helps, break the transmission cycle / prevent the spread of (antibiotic) resistant bacteria</td></tr>
<tr><td>10 few / no, side-effects</td><td rowspan="2">idea of treatment more, acceptable / efficient (compared to other treatments)
allow if column 1 uses comparative phraseology</td></tr>
<tr><td>11 treatment duration may be short</td></tr>
</table>
</td><td></td></tr>
</table>

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Question	Answer	Marks
3(a)	**I** take antibiotics *any **two** from:* **1** wash hands, qualified **;** e.g. thoroughly / regularly / with soap before handling food *context is, preparing / eating* **I** cooking after, urination / defaecation **A** after using the toilet / AW **I** properly / correctly **2** cook food, qualified **;** e.g. thoroughly / completely / to destroy pathogen **;** **A** *ref. to* uncontaminated food e.g. from commercial (safe) sources **bod** boiling food **3** drink water that is, safe / bottled / treated / chlorinated / uncontaminated / boiled / filtered to remove pathogens / UV-treated **; bod** sterilised / piped **A** avoid bottle feeding if water source unknown **I** clean / sanitised **/** pure **R** disinfected **R** drink boiling water **4** do not, buy / use, ice from untrusted sources **;** AW **5** do not eat (raw), fruit / vegetables, washed in water from unknown sources / prepared by other people / *ref. to* plants irrigated with contaminated water **;** **6** avoid eating, (potentially contaminated) raw fish / shellfish **;** **7** do not, swim in (potentially) / wash in, (potentially) contaminated water **;** **8** AVP **;** e.g. do not share towels cover food from flies	**2**

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>3(b)(i)</td><td>
candidates should use evidence that does not agree with statement ‘as the number of cases of cholera decreases, the CFR also decreases’

correct calculation of missing CFR ; allow written into Table 3.1
Democratic Republic of the Congo (DRC) 0.9 (%) R 0.898 (%)
or
Sudan 2.8 (%) bod 2.77 (%)

correct evidence referencing DRC or Sudan ; e.g.
DRC highest number of cases but lower CFR than, Malawi / Ethiopia / Sudan
R Somalia
Sudan has lowest cases but highest CFR or higher than, DRC / Malawi / Ethiopia / Somalia
A use of relevant data (from calculation and Table 3.1)
<table>
<tr><td>DRC</td><td>52 654</td><td>0.9</td></tr>
<tr><td>Malawi</td><td>32 530</td><td>2.5</td></tr>
<tr><td>Ethiopia</td><td>30 389</td><td>1.5</td></tr>
<tr><td>Somalia</td><td>18 304</td><td>0.3</td></tr>
<tr><td>Sudan</td><td>8 895</td><td>2.8</td></tr>
</table>
‘agree’, or incorrect CFRs calculated: allow one mark ecf for quoting relevant comparative data from Table 1.1 and (if stated) the incorrect values must include, country / number of cases, <u>and</u> CFR value
</td><td>2</td></tr>
</table>

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Question	Answer	Marks
3(b)(ii)	*any **three** from:* *assume points about Malawi if not stated,* **ora** *for Ethiopia* **1** *ref. to* medical treatment, qualified **;** e.g. fewer qualified medical personnel fewer, health centres / hospitals less life-saving equipment available **2** antibiotics given were, not effective / used against drug-resistant strains **;** AW **3** antibiotics (for severe cases), qualified **;** e.g. did not receive / example – could not afford / lack of supply from authorities received / treated / diagnosed, too late **4** oral rehydration, salts / therapy, qualified **; A** ORT / ORS e.g. insufficient / no access to, oral rehydration points / ORPs *allow examples given in mp3* **5** late diagnosis / long time before treatment began **;** *allow if not stated for mp3 or 4* **6** people with cholera have no access to, safe / uncontaminated, drinking water **or** *ref. to* contaminated water used to make up ORS **;** **7** (initial) misdiagnosis / false-negative test result (so, no / incorrect, treatment) **;** **8** *idea of* less (targeted) education about treatment (of cholera) / did not seek treatment **; I** *ref. to* prevention '*more people were educated to get oral rehydration salts for treatment*' *is mp4 and mp8* **9,10** AVP **;;** e.g. country / areas affected, proportionately higher people at risk e.g. elderly / infants / with other conditions more accurate reporting of numbers of death ref. to inaccessibility owing to, conflict / natural disasters *idea that* greater proportion of people with cholera also had HIV/AIDs	**3**

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Question	Answer	Marks
3(c)(i)	*ref. to part of DNA not needed as this is in the question* sequence of, bases / nucleotides **;** coding for a polypeptide **; A** protein *for polypeptide* **bod** expressing *for coding* **A** *idea of* genetic information for the synthesis of a (specific) protein	**2**
3(c)(ii)	*any **two** from:* **I** plasmids 70S ribosomes **;** cell wall made of, peptidoglycan / murein **;** AVP **;;** *allow other non-syllabus bacterial structures found in V. cholerae* e.g. capsule flagellum made of flagellin pilus / pili	**2**

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Question	Answer	Marks
4(a)	*any **three** from:* **1** blood arriving / blood from pulmonary artery, has low partial pressure of oxygen / AW **;** **bod** deoxygenated blood *must be clear that it is blood arriving* **2** (so) steep diffusion gradient (for oxygen) **;** **A** high rate of diffusion *if mp1and mp2 not gained, allow 1 mark for correct explanation referencing, diffusion / diffusion gradient / concentration gradient, for oxygen* *at 13.2 to13.3 kPa partial pressure in alveolar air* **3** haemoglobin has, high / higher, affinity for oxygen **;** *be flexible with 'for' 'of'* **4** allows, percentage saturation of haemoglobin with oxygen to be 98% / haemoglobin (molecule) to bind (all) 4, oxygen molecules / O_2**;** *context is almost all molecules each bind 4* O_2 **R** 4 oxygen atoms **A** 8 oxygen atoms **A** each haem group binds an oxygen molecule *allow abbreviation for haemoglobin as it is stated in the question text* **5** *idea that* formation of oxyhaemoglobin / oxygen binding to haemoglobin, (removes oxygen) to maintain diffusion gradient **;** **6** AVP **;** *ref. to* positive cooperativity / allosteric effect / described / binding of O_2 makes it easier for 2nd to bind owing to conformational change	**3**
4(b)(i)	(2.4 kPa = 31 / 32 5.6 kPa = 76 / 77) correct values for percentage saturation extracted **;** correct answer **;** *decreases by* 76 – 31 **or** 77 – 32 = 45 (%) **or** 77 – 31= 46 (%) **or** 76 – 32 = 44 (%)	**2**
4(b)(ii)	*any **one** relevant e.g.:* metabolic rate / respiration rate / activity, of, tissue / cells **;** rate of blood flow / AW (in capillary network) **;** AVP **;**	**1**

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Question	Answer	Marks
4(c)	vena cava **;** **I** superior / inferior **A** venae cavae **R** vana cava	**1**

Question	Answer	Marks
5(a)(i)	facilitated diffusion **;** osmosis **;** **R** osmoses / osimosis	**2**
5(a)(ii)	(water always moves) down a water potential gradient **or** from a high(er) / less negative, water potential to, low(er) / more negative, water potential **;** **A** ψ for water potential **R** high water potential gradient to a low water potential gradient *allow ref. to the root cell has a higher water potential* *or adjacent cell has lower water potential*	**1**
5(b)(i)	endodermis **;** endodermal (layer) / endodermal tissue / endodermal cells **R** endodermis / Casparian strip *giving a choice* **A** endodermis with Casparian strip *any **one** from: allow ecf from mp1* *can give descriptions of apoplast and symplast pathways instead of using terms* **R** if *ref. to* symplast pathway is related to movement within xylem *idea that* water, moves from apoplast to symplast pathway (to reach xylem) has to take the symplast pathway / can no longer take the apoplast pathway **;** waterproof to, prevent passage of water in apoplast pathway / direct water into the symplast pathway **;** protective / control, function i.e. water must cross cell surface membrane **;** e.g. prevents entry of pathogens into xylem control of mineral ions	**2**

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Question	Answer	Marks
5(b)(ii)	**A** xylem and phloem / vascular bundle, for vascular tissue *similarities* **1** endodermis surrounding vascular tissue **;** **2** vascular tissue, centrally located / in the central area / not on the periphery / not near the epidermis **;** **I** in the, middle / centre **3** epidermis with root hairs / epidermal cells with root hairs **;** **A** outer / surface, layer with root hair cells **4** outer to inner layer described as epidermis then cortex then, endodermis / vascular tissue **;** **bod** cortex described as parenchyma cells *differences* *monocotyledon* **5** pith / parenchyma tissue / described at the centre **;** **ora** xylem / xylem and phloem / vascular tissue, at the centre **6** circular arrangement of vascular tissue **; A** arranged in a ring **7** *ref. to* pattern of xylem not, cross / star-shaped / AW **;** *context is not, e.g. tetrarch / pentarch pattern* **8** AVP **;** cambium / cambial tissue, not visible / not present	**4**

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>6(a)</td><td>(they are) large / AW (molecules / size) ;
I large volume
A composed of, many / AW, atoms
bod large, (molecular) mass / molecular weight

lipid not composed of (same or similar), repeating / repeated,
subunits / monomers / residues ; ora
accept ‘many of the, same / similar’ for repeating
bod units for subunits
A protein composed of (monomers of) amino acids
A polysaccharide composed of, (monomers of) monosaccharides</td><td>2</td></tr>
<tr><td>6(b)(i)</td><td>peptide bond column correct ;

amylopectin and cellulose with glycosidic bond ;

glycogen with glycosidic bond <u>and</u> triglyceride with ester bond ;

<table>
<tr><th>biological molecule</th><th>peptide bond</th><th>glycosidic bond</th><th>ester bond</th></tr>
<tr><td>amylopectin</td><td></td><td>✓</td><td></td></tr>
<tr><td>cellulose</td><td></td><td>✓</td><td></td></tr>
<tr><td>collagen</td><td>✓</td><td></td><td></td></tr>
<tr><td>glycogen</td><td></td><td>✓</td><td></td></tr>
<tr><td>triglyceride</td><td></td><td></td><td>✓</td></tr>
</table>
</td><td>3</td></tr>
</table>

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Question	Answer	Marks
6(b)(ii)	amylopectin and glycogen **;** *both have* (monomers of) <u>alpha</u> / <u>α-</u> , glucose **or** α-1, 4 / α-1, 6 / 1, 4 <u>and</u> 1, 6 (glycosidic) bonds **or** branched / branching (structure) **;** *if giving more than one feature then all must be correct, so* **R** beta- / β-, glucose **R** have <u>only</u>, α-1, 4 bonds / α-1, 6 bonds **R** coiled / helical **I** ref. to ring structure for glucose *if cellulose with, amylopectin or glycogen, stated, allow one mark if ref. to 1, 4 glycosidic bonds **or** composed of glucose monomers **or** are glucose polymers*	**2**
6(c)	***either*** mucous glands / mucous gland cell **;** goblet cells **;** } either order **I** ciliated epithelium **or** *two from:* and trachea, bronchus, (larger) bronchiole **;; A** windpipe **R** tracheae **R** bronchio	**2**

Question	Answer	Marks
6(d)	stimulates / triggers / initiates / AW, an immune response **;** causes / AW, production / synthesis, of (specific) antibody against it **;** **A** forms a complex with / binds to / complementary to, an antibody **A** binds to antigen binding site on antibody *plus max **two** from:* high molecular, mass / weight **;** activates / triggers a response in, T-lymphocytes / B-, lymphocytes / macrophages / neutrophils / phagocytes **A** binds to receptors on (T-/B-) lymphocytes *also mp2 if binding to, antibody / immunoglobulin, on B-lymphocytes* located on the surface of cells / (can) acts as cell marker / involved in cell recognition **;** **A** surface of, pathogens / bacteria / virus **A** recognised by cells of the immune system **A** named cell AVP **;** e.g. complex structure / AW	**3**

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