GCE

Biology A

H020/02: Depth in biology

AS Level

Mark Scheme for June 2024

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of candidates of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, Cambridge Nationals, Cambridge Technicals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

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MARKING INSTRUCTIONS

PREPARATION FOR MARKING
RM ASSESSOR

1. Make sure that you have accessed and completed the relevant training packages for on-screen marking: *RM Assessor Assessor Online Training*; *OCR Essential Guide to Marking*.

2. Make sure that you have read and understood the mark scheme and the question paper for this unit. These are posted on the RM Cambridge Assessment Support Portal http://www.rm.com/support/ca

3. Log-in to RM Assessor and mark the **required number** of practice responses ("scripts") and the **number of required** standardisation responses.

   YOU MUST MARK 10 PRACTICE AND 10 STANDARDISATION RESPONSES BEFORE YOU CAN BE APPROVED TO MARK LIVE SCRIPTS.

MARKING

1. Mark strictly to the mark scheme.

2. Marks awarded must relate directly to the marking criteria.

3. The schedule of dates is very important. It is essential that you meet the RM Assessor 50% and 100% (traditional 40% Batch 1 and 100% Batch 2) deadlines. If you experience problems, you must contact your Team Leader (Supervisor) without delay.

4. If you are in any doubt about applying the mark scheme, consult your Team Leader by telephone or the RM Assessor messaging system, or by email.

5. **Crossed Out Responses**
   Where a candidate has crossed out a response and provided a clear alternative then the crossed out response is not marked. Where no alternative response has been provided, examiners may give candidates the benefit of the doubt and mark the crossed out response where legible.

Rubric Error Responses – Optional Questions
Where candidates have a choice of question across a whole paper or a whole section and have provided more answers than required, then all responses are marked and the highest mark allowable within the rubric is given. Enter a mark for each question answered into RM assessor, which will select the highest mark from those awarded. *(The underlying assumption is that the candidate has penalised themselves by attempting more questions than necessary in the time allowed.)*

Multiple Choice Question Responses
When a multiple choice question has only a single, correct response and a candidate provides two responses (even if one of these responses is correct), then no mark should be awarded (as it is not possible to determine which was the first response selected by the candidate).
When a question requires candidates to select more than one option/multiple options, then local marking arrangements need to ensure consistency of approach.

Contradictory Responses
When a candidate provides contradictory responses, then no mark should be awarded, even if one of the answers is correct.

Short Answer Questions (requiring only a list by way of a response, usually worth only **one mark per response**)
Where candidates are required to provide a set number of short answer responses then only the set number of responses should be marked. The response space should be marked from left to right on each line and then line by line until the required number of responses have been considered. The remaining responses should not then be marked. Examiners will have to apply judgement as to whether a 'second response' on a line is a development of the 'first response', rather than a separate, discrete response. *(The underlying assumption is that the candidate is attempting to hedge their bets and therefore getting undue benefit rather than engaging with the question and giving the most relevant/correct responses.)*

Short Answer Questions (requiring a more developed response, worth **two or more marks**)
If the candidates are required to provide a description of, say, three items or factors and four items or factors are provided, then mark on a similar basis – that is downwards (as it is unlikely in this situation that a candidate will provide more than one response in each section of the response space.)

Longer Answer Questions (requiring a developed response)
Where candidates have provided two (or more) responses to a medium or high tariff question which only required a single (developed) response and not crossed out the first response, then only the first response should be marked. Examiners will need to apply professional

judgement as to whether the second (or a subsequent) response is a ‘new start’ or simply a poorly expressed continuation of the first response.

6. Always check the pages (and additional objects if present) at the end of the response in case any answers have been continued there. If the candidate has continued an answer there, then add a tick to confirm that the work has been seen.

7. Award No Response (NR) if:
    - there is nothing written in the answer space

    Award Zero ‘0’ if:
    - anything is written in the answer space and is not worthy of credit (this includes text and symbols).

    Team Leaders must confirm the correct use of the NR button with their markers before live marking commences and should check this when reviewing scripts.

8. The RM Assessor **comments box** is used by your team leader to explain the marking of the practice responses. Please refer to these comments when checking your practice responses. **Do not use the comments box for any other reason.**
    If you have any questions or comments for your team leader, use the phone, the RM Assessor messaging system, or e-mail.

9. A*ssistant Examiners will send a brief report on the performance of candidates to their Team Leader (Supervisor) via email by the end of the marking period. The report should contain notes on particular strengths displayed as well as common errors or weaknesses. Constructive criticism of the question paper/mark scheme is also appreciated.*

10. **For answers marked by levels of response:**
Read through the whole answer from start to finish, using the Level descriptors to help you decide whether it is a strong or weak answer. The indicative scientific content in the Guidance column indicates the expected parameters for candidates' answers, but be prepared to recognise and credit unexpected approaches where they show relevance. Using a 'best-fit' approach based on the skills and science content evidenced within the answer, first decide which set of level descriptors, Level 1, Level 2 or Level 3, best describes the overall quality of the answer.

Once the level is located, award the higher or lower mark:

The higher mark should be awarded where the level descriptor has been evidenced and all aspects of the communication statement (in italics) have been met.

The lower mark should be awarded where the level descriptor has been evidenced but aspects of the communication statement (in italics) are missing.

In summary:

The skills and science content determines the level.

The communication statement determines the mark within a level.

Level of response questions on this paper are **2(a)(ii) and 4(c).**

11. Annotations available in RM Assessor

Marking Annotations

Annotation	Use
BOD	Benefit of Doubt
CON	Contradiction
	Cross
ECF	Error Carried Forward
GM	Given Mark
	Extendable horizontal wavy line (to indicate errors / incorrect science terminology)
I	Ignore
	Large dot (various uses as defined in mark scheme)
	Highlight (various uses as defined in mark scheme)
NBOD	Benefit of the doubt not given
	Tick
^	Omission Mark
BP	Blank Page
L1	Level 1 answer in Level of Response question
L2	Level 2 answer in Level of Response question
L3	Level 3 answer in Level of Response question

12. Abbreviations, annotations and conventions used in the detailed Mark Scheme (to include abbreviations and subject-specific conventions).

Annotation	Meaning
/	alternative and acceptable answers for the same marking point
✓	Separates marking points
DO NOT ALLOW	Answers which are not worthy of credit
IGNORE	Statements which are irrelevant
ALLOW	Answers that can be accepted
( )	Words which are not essential to gain credit
__	Underlined words must be present in answer to score a mark
ECF	Error carried forward
AW	Alternative wording
ORA	Or reverse argument

13. **Subject-specific Marking Instructions**

INTRODUCTION

Your first task as an Examiner is to become thoroughly familiar with the material on which the examination depends. This material includes:

- the specification, especially the assessment objectives
- the question paper
- the mark scheme.

You should ensure that you have copies of these materials.

You should ensure also that you are familiar with the administrative procedures related to the marking process. These are set out in the OCR booklet **Instructions for Examiners**. If you are examining for the first time, please read carefully **Appendix 5 Introduction to Script Marking: Notes for New Examiners**.

Please ask for help or guidance whenever you need it. Your first point of contact is your Team Leader.

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>1</td><td>(a)</td><td>(i)</td><td>non-random / systematic ✓</td><td>1</td><td></td></tr>
<tr><td></td><td></td><td>(ii)</td><td>FIRST CHECK THE ANSWER (if answer not on answer line look in the table)

If answer = 0.71 award 3 marks

0.71 ✓✓✓

If final answer incorrect or not to 2 sig fig, award 2 marks:

0.29 ✓✓

If ∑(n/N)² / 0.29 incorrect, award 1 mark for:

row values for, n/N and (n/N)², correctly entered ✓</td><td>3</td><td>
<table>
<tr><th>Species</th><th>n = Number of organisms</th><th>n/N</th><th>(n/N)²</th></tr>
<tr><td>Foxglove</td><td>3</td><td>0.13</td><td>0.02</td></tr>
<tr><td>Meadow buttercup</td><td>7</td><td>0.30</td><td>0.09</td></tr>
<tr><td>Oxeye daisy</td><td>9</td><td>0.39</td><td>0.15</td></tr>
<tr><td>Yellow rattle</td><td>4</td><td>0.17</td><td>0.03</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>N = 23</td><td></td><td>∑(n/N)² = 0.29</td></tr>
<tr><td></td><td></td><td></td><td>1 - ∑(n/N)² = 0.71</td></tr>
</table>
ECF for one incorrect rounding in table:

ALLOW 2 marks for
∑(n/N)² and 1 - ∑(n/N)² to 2 sig fig ✓✓

e.g. [(n/N)²] 0.09, 0.15, 0.02 so ∑(n/N)² = 0.28 and 1 - ∑(n/N)² = 0.72 = 2 marks</td></tr>
<tr><td></td><td></td><td>(iii)</td><td>(biodiversity is) high ✓</td><td>1</td><td>ALLOW low as ECF from 1(a)(ii)
ALLOW field / it, is diverse / has high species evenness and richness</td></tr>
</table>

Question			Answer	Marks	Guidance
	(b)		**1** (in both areas kick for) same number of times ✓ **2** same, kicking method used / depth of sweep net ✓ **3** sweep net is, downstream of student kicking / facing upstream ✓	**max 1**	**e.g**. kick sampling for 5 minutes in each part of river **e.g.** heel of foot kicking (in the direction of the net) / kick with same force / same person does the kicking
	(c)		**1** reduction in (species / habitat) diversity ✓ **2** species may, decrease / disappear, as they relied on the, keynote species/trees, for their, food / habitat ✓ **3** species may increase as they are not competing for (named) resources ✓	**max 1**	**ALLOW** organisms / animals / plants for 'species' **ALLOW** named species reduction (in diversity) **IGNORE** species will become extinct **ALLOW** habitat will be damaged for organisms so they will disappear
			Total	**7**	

Question			Answer	Marks	Guidance
2	(a)	(i)	*Ant climbs to high point so* **1** spores dispersed a, large / wide, distance ✓ **2** many / other / uninfected, ants can be infected ✓ **3** increased / rapid, fungal growth / spread of infection, as it is, warmer / humid / windy ✓ *Ants bite into branch/leaf* **4** ants, secure / still, (ready) for fungal, growth / ease of feeding / spore dispersal ✓	**max 2**	**IGNORE** *ref to* tree / plants / birds, becoming infected or spreading the fungus e.g. '*ant climbs to high point which has more air movement so spores travel further'* = mp1 and 3 **ALLOW** ant stays still so, other / uninfected, ants could, become infected / come into contact with spores **4 IGNORE** provides ant with more material to, digest/feed on
		(ii)*	Please refer to the marking instructions on page 4 of this mark scheme for guidance on how to mark this question. **Level 3 (5–6 marks)** Detailed use of the data in **Fig. 2.2 and Fig. 2.3** to support **or** not support the student's conclusion, describing the relationship between infection rates and **both** rainfall **and** temperature **AND** detailed analysis of infection data from **Fig. 2.2 and** temperature **and** rainfall data from **Fig. 2.3.** *There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.* **Level 2 (3–4 marks)** Use of the data in **Fig. 2.2 and Fig. 2.3** to support **or** not support the student's conclusion, describing the relationship between infection rates and **both** rainfall **and** temperature **AND** analysis of infection data from **Fig. 2.2 and** temperature **or** rainfall data from **Fig. 2.3.**	**6**	**Indicative points can include:** Data **supports** because: *Infection rates are affected after rainfall* • Rainfall high in May to July, infections peak in Sept • Highest numbers of infections are in Sept to Oct, 1-3 months after heavy rainfall *Temperature has no effect because* • Temperatures are highest May to September but infection rates vary / infection rates only start to increase / peak in Sept to Oct • Temp lowest Jan-Feb but infection rate varies • Temp decreasing from Sept but infections, are high in Sept and Oct / vary • Temp constant between July-Sep but infections vary/increase

Question			Answer	Marks	Guidance
			There is a line of reasoning presented with some structure. The information presented is relevant and supported by some evidence. **Level 1 (1–2 marks)** Reference to supporting **or** not supporting the student's conclusion. Reference to the data in **Fig. 2.2 and Fig. 2.3**, describing a relationship between infection rates and **either** rainfall **or** temperature **AND** simple analysis of the data in **Fig. 2.2 or Fig. 2.3**. *There is an attempt at a logical structure with a line of reasoning. The information is in the most part relevant.* **0 marks** *No response or no response worthy of credit.*		Data does **not support** because: *Infection rates not affected by rainfall* • Infections peak in Feb when rainfall is low • Low rainfall (below 5) when infection rates high(er) • Peak infections in Sep-Oct when rainfall decreased long before. • Peak rainfall in (end of) May but June has lowest infection number • Infection number increases before (and during) heavy rainfall *Infection rates are affected by temperature* • Infection rates increase as temperature increases / ORA • Infections peak after 3 or 4 months of sustained high temperatures • Infections increase in July-Sep when temperature is high • Infection rates low in Nov/Dec and temperature is low *General* • Data from only one year (2017) • Data from only one country (Taiwan) *Examples of when the communication statement would be met include:* Correct use of units for data provided Clear reference to the student's conclusion

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td></td><td>(b)</td><td></td><td>
<table>
<tr><th>Communicable Disease</th><th>Type of Pathogen</th></tr>
<tr><td>Influenza</td><td>virus</td></tr>
<tr><td>Malaria</td><td>protoctist</td></tr>
<tr><td>Black sigatoka in bananas</td><td>fungus</td></tr>
</table>
✓✓✓</td><td>3</td><td>DO NOT ALLOW more than one answer for each type of pathogen

ALLOW protist/protozoa for ‘protoctist’</td></tr>
<tr><td></td><td></td><td></td><td>Total</td><td>11</td><td></td></tr>
</table>

			Answer	Marks	Guidance
3	(a)		*Method 2 is facilitated diffusion because:* **1** more particles added / as concentration increases, the rate (of uptake) increases then remains constant ✓ **2** (diffusion requires) transport / membrane, proteins ✓ **3** (constant when) all the proteins are, saturated / full / working at max rate ✓ **4** (so) adding more particles / greater concentration, will not increase the rate of, uptake / diffusion ✓	**max 3**	No mark awarded for Method 1 **2 IGNORE** pores **2 ALLOW** (named) channel / carrier, proteins **3 ALLOW** 'used up' for 'full
	(b)		surface area / diffusion distance ✓	**1**	**ALLOW** thickness / width, of membrane/exchange surface **IGNORE** volume ratio
	(c)	(i)	stopwatch / timer ✓ thermometer / water bath ✓ measuring cylinder / pipette / syringe ✓ ruler ✓	**max 2**	**IGNORE** beaker
		(ii)	**1** add glucose (solution) to the, dialysis tubing / model cell ✓ **2** knot / secure dialysis tubing, before / after, addition of glucose ✓	**max 4**	**ALLOW** Visking tubing for dialysis tubing throughout **1 ALLOW** tubing containing glucose (solution)

			Answer	Marks	Guidance
			3 place (tubing) in a water bath and remove sample (around tubing) at, certain / specified / set, time interval(s) ✓ **4** add Benedict's (solution) to sample to test for glucose ✓ **5** use colorimeter to obtain, absorption / transmission, values ✓ **6** use calibration curve to estimate the <u>concentration</u> of glucose ✓ **7** repeat at / use, different temperatures ✓		**3 ALLOW** glucose solution for 'sample' **3 IGNORE** remove sample from inside the dialysis tubing **3 ALLOW** dialysis tubing added to, test tube/beaker, of water **4 IGNORE** adding Benedict's to the dialysis tubing **4 ALLOW** look at colour with Benedicts to see how much glucose is present
	(d)		**1** as temperature increase the <u>kinetic</u> energy of the glucose molecules increases ✓ **2** (increased temperature causes) glucose molecules, move / diffuse (from dialysis tubing) at a fast<u>er</u> rate ✓ **3** correct analysis of figures with units from table ✓ **4** greater rate between 10°C and 20°C ✓	**max 3**	**ALLOW** ORA for MP 1- 3 **IGNORE** ref to phospholipid bilayer **2 ALLOW** as temperature increases the rate of glucose diffusion increases **2 DO NOT ALLOW** increased rate of glucose diffusion in context of increased permeability of membrane. **3 e.g.** from 20°C-40°C increase in temp, the glucose concentration increases by 1.1 moldm^{-3}
			Total	**13**	

Question			Answer	Marks	Guidance
4	(a)	(i)	3:1 / higher, collagen:elastin ratio, leads to, an aneurysm forming / a larger aneurysm ✓	1	**IGNORE** as the aneurysm size increases the collagen:elastin ratio increases
		(ii)	**FIRST CHECK THE ANSWER ON ANSWER LINE. If answer = 5.297 award 3 marks** 5.297 ✓✓✓ **If answer incorrect allow:** $(O-E)^2$ = 1156 (males and females) ✓ $(O-E)^2/E$ = 1.927 **and** 3.370 (males and females) ✓	3	**ALLOW** 2 marks for **correct answer** to incorrect significant figures **ALLOW** 1.927 **and** 3.370 to incorrect significant figures. *Calculation:* *= $(-34)^2/600 + (34)^2/343$* *= 1156/600 + 1156/343* *= 1.927 + 3.370 = 5.2968 = 5.297*
		(iii)	**1** reject the null hypothesis / there is a difference between expected and observed (at the 5% level) ✓ **2** as (calculated) chi squared is higher than, the critical value of 3.841 ✓ **3** using 1, df / degree of freedom (at the 5% level) ✓	max 2	**ALLOW** ECF from 4(a)(ii) throughout **1 ALLOW** ECF from incorrect critical value used **2 ALLOW** 3.841 (only) circled in table for 'the critical value of 3.841'. **2 ALLOW** 5.297 >3.841 **3 ALLOW** 1 df circled in the table
	(b)	(i)	**1** stops backflow of blood due to low pressure ✓ **2** allows (one way) flow back to the heart ✓	2	**2 ALLOW** stops backflow of blood so blood goes to the heart

Question			Answer	Marks	Guidance
		(ii)	**1** relaxation of smooth muscle (in arteriole) causes vasodilation (of the lumen) ✓ **2** (this) regulates / controls, blood flow to capillaries (in the organ) ✓ **3** pressure of blood in artery is higher ✓ **4** as blood flows from the artery to the arteriole, the pressure falls ✓ **5** (so) capillary (walls) will not rupture ✓	**max 3**	**IGNORE** ref to the, small size / number, of arterioles **IGNORE** ref to vasoconstriction **2 IGNORE** ref to diffusion **3 ALLOW** arterioles have a lower pressure

	(c)*		Please refer to the marking instructions on page 4 of this mark scheme for guidance on how to mark this question. **Level 3 (5–6 marks)** A full and detailed description of how heart action is initiated by the SAN **AND** coordinated including the AVN, Bundle of His **AND** Purkyne fibres **AND** a detailed explanation of why the atria and ventricles don't contract at the same time. *There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.* **Level 2 (3–4 marks)** A detailed description of how heart action is initiated by the SAN **AND** coordinated to include the AVN and Bundle of His **OR** Purkyne fibres **AND** a simple explanation of why the atria and ventricles don't contract at the same time. *There is a line of reasoning presented with some structure. The information presented is relevant and supported by some evidence.* **Level 1 (1–2 marks)** A brief description of how heart action is initiated by the SAN **AND** coordinated with the AVN **OR** reference to the delay after the SAN. *There is an attempt at a logical structure with a line of reasoning. The information is in the most part relevant.* **0 marks** *No response or no response worthy of credit.*	**6**	**Indicative points may include:** **SAN** • (starts the) wave of excitation • electrical activity causes **atria** to contract • non conducting tissue • ref to pace maker • myogenic / not requiring input from brain **AVN** • atrio-ventricular node (AVN) • picks up electrical activity from SAN **Contraction not at same time** • AVN causes a slight (0.1ms) delay • (AVN) delay ensures atria have stopped contracting before the ventricles contract • Ventricles only contract when (wave of excitation in) Purkyne fibres • Makes sure blood has, left the atria/ entered the ventricles. • Otherwise less blood will exit the heart **Bundle of His and Purkyne fibres** • AVN stimulates Bundle of His • Bundle of His in septum • Bundle of His conducts wave of excitation to apex (of heart) • Bundle of His / Purkyne, is specialised muscle fibres • Purkyne fibres in walls of ventricles • Purkyne fibres ensures ventricles contract at same time *Examples of when the communication statement would be met include:*

					Correct chronology of the electrical activity Focus on electrical activity associated with the cardiac cycle
			Total	**17**	

Question			Answer	Marks	Guidance
5	**(a)**	**(i)**	**1** use, dropper / pipette (to remove sample of pondwater) to place a, small amount / drop / droplet, onto slide ✓ **2** place coverslip , over the sample / on the slide ✓ **3** ensuring there are no air bubbles ✓	**max 2**	**IGNORE** ref to smearing the water sample / staining the sample **1 DO NOT ALLOW** few drops (added to slide)
		(ii)	**1** select low power lens then higher power ✓ **2** use coarse focus to find, correct field of view / object ✓ **3** use fine focus for clear(er) image ✓ **4** *ref to* x4 / x10 / x40 (lens power / magnification) ✓	**max 2**	**1 ALLOW** magnification for 'power' **2 ALLOW** adjustment for 'focus' **2 IGNORE** ref to fine focus for finding correct field of view **3 IGNORE** ref to coarse focus for getting a clear image
	(b)		**1** magnification stated (in both figures) ✓ **2** all / only, (named) components in photomicrograph are drawn ✓ **3** no shading ✓ **4** correct proportions of, cells / nuclei ✓	**max 2**	**IGNORE** ref to what is not drawn on **Fig 5.2** **2 ALLOW** only 2 cells are drawn **2 ALLOW** nucleus is drawn (as seen in photomicrograph)

Question			Answer	Marks	Guidance
			5 specifies type of cells / states <u>cheek</u> cells / specimen is named ✓		**5 IGNORE** has a title unqualified
	(c)	**(i)**	*Compared to light microscope* **1** nuclear pore / nuclear envelope / vesicle / golgi apparatus, are visible ✓ **2** high(er) magnification / mag is x100 000 ✓ *Compared to scanning EM* **3** image is 2D ✓	**max 2**	**IGNORE** ref to image being black and white **IGNORE** ref to resolution **1 IGNORE** any other named organelle **3 ALLOW** image is not 3D as with a SEM
		(ii)	**1** proteins are synthesised / translation occurs, on the ribosomes (of RER) ✓ **2** proteins then pass into, lumen / cisternae (of RER) ✓ **3** proteins can, fold / have carbohydrate added ✓ **4** (proteins) are packaged into, <u>transport</u> vesicles ✓ **5** (transport) vesicles move to Golgi by microtubules ✓ **6** vesicles fuse with <u>cis</u> face of Golgi ✓	**max 4**	**ALLOW** RER for rough endoplasmic reticulum throughout **4 ALLOW** <u>transport</u> vesicles carry protein to the Golgi (from RER) **5 ALLOW** cytoskeleton for 'microtubules' **5 DO NOT ALLOW** vesicles moving to SER from RER (then Golgi)

Question			Answer	Marks	Guidance
			7 proteins are modified in Golgi and packaged into, (secretory) vesicles ✓		**7 ALLOW** proteins are processed for 'proteins are modified' **7 DO NOT ALLOW** proteins packaged as vesicles for 'packaged into vesicles'
		(iii)	requires, energy / ATP ✓	**1**	**DO NOT ALLOW** in context of diffusion
	(d)		**1** provides <u>mechanical strength</u> to the cell ✓ **2** holds organelles in place ✓ **3** aids transport of, (named) molecules / (named) organelles (within the cell) ✓ **4** cell movement ✓ **5** maintains cell, shape / structure / integrity / stability ✓ **6** (role in) cell division / cytokinesis / spindle fibres ✓	**max 3**	**ALLOW** microtubules / microfilaments for 'cytoskeleton' context
			Total	**16**	

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>6</td><td>(a)</td><td>(i)</td><td>amine ✓
carboxyl ✓</td><td>2</td><td>IGNORE structural / molecular, formulae
ALLOW amino for ‘amine’
ALLOW carboxylic acid (group) for ‘carboxyl’</td></tr>
<tr><td></td><td></td><td>(ii)</td><td>circle drawn completely around bond between C=O AND
the N-H ✓</td><td>1</td><td>ALLOW circle to encompass C=O AND the N-H
IGNORE circle line on part of the bonds immediately before and after C=O AND the N-H</td></tr>
<tr><td></td><td></td><td>(iii)</td><td><u>hydrolysis</u> ✓</td><td>1</td><td></td></tr>
<tr><td></td><td>(b)</td><td></td><td>
<table>
<tr><th>Statement</th><th>True</th><th>False</th></tr>
<tr><td>Breaking one ester bond in a triglyceride produces glycerol and three fatty acids.</td><td></td><td>✓</td></tr>
<tr><td>Ribose is a hexose monosaccharide.</td><td></td><td>✓</td></tr>
<tr><td>In an alpha glucose molecule, the hydroxyl (OH) group is positioned below carbon 1.</td><td>✓</td><td></td></tr>
</table>
All 3 rows correct ✓✓
Any 2 rows correct ✓</td><td>2</td><td>ALLOW a cross in place of a tick</td></tr>
<tr><td></td><td></td><td></td><td>Total</td><td>6</td><td></td></tr>
</table>

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