

Cambridge Technicals

Applied Science

Unit 22: Global scientific information

Level 3 Cambridge Technical in Applied Science
05874

Mark Scheme for june 2025

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

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, email or via the RM Assessor messaging system.
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 the annotation 'SEEN' to confirm that the work has been seen and mark any responses using the annotations in section 11.

7. There is a NR (**No Response**) option. Award NR (No Response):

- if there is nothing written at all in the answer space
- OR if there is a comment which does not in any way relate to the question (e.g., 'can't do', 'don't know')
- OR if there is a mark (e.g., a dash, a question mark) which is not an attempt at the question.

Note: Award 0 marks – for an attempt that earns no credit (including copying out the question).

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.**

9. Assistant 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: Not applicable in F501

To determine the level – start at the highest level and work down until you reach the level that matches the answer

To determine the mark within the level, consider the following

Descriptor	Award mark
On the borderline of this level and the one below	At bottom of level
Just enough achievement on balance for this level	Above bottom and either below middle or at middle of level (depending on number of marks available)
Meets the criteria but with some slight inconsistency	Above middle and either below top of level or at middle of level (depending on number of marks available)
Consistently meets the criteria for this level	At top of level

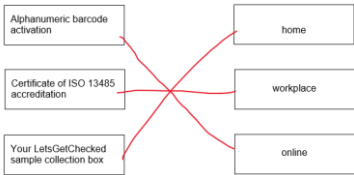
11. Annotations available in RM Assessor

Annotation	Meaning
	Correct response
	Incorrect response
	Omission mark
	Benefit of doubt given
	Contradiction
	Rounding error
	Error in number of significant figures
	Error carried forward
	Level 1
	Level 2
	Level 3
	Benefit of doubt not given
	Noted but no credit given
	Ignore

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
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
<u>—</u>	Underlined words must be present in answer to score a mark
ECF	Error carried forward
AW	Alternative wording
ORA	Or reverse argument

Question			Answer	Mark	Guidance
1	a	i	individual researcher / 1 ✓	1 1.1.1	
		ii	Any two: A, D, E, G, H, I ✓✓	2 1.1.1	
	b	i	educational institution / 3 ✓	1 1.1.3,4	
		ii	C and/or D ✓ and any two or three from: E, F, G, H, I ✓	2 1.1.3,4	
			Total	6	

Question			Answer	Mark	Guidance
2	a		 ✓✓✓	3 1.2.6, 7, 9	
	b	(i)	idea that it is a built-up area ✓	1 1.2.4	ALLOW town / city
		(ii)	any two from: • access - more facilities e.g. laboratories / universities • accessibility – ease of travel to/within / more roads/airports/infrastructure • diversity – wider range of scientific disciplines / experts / industries / wider range of specialist laboratories • opportunities – more work options for research • AVP ✓✓	2	
	c	(i)	requires wifi / internet connection ✓ requires compatible software to convert the data to text or sound ✓	2 1.4.1, 4	
			Total	8	

Question			Answer					Mark	Guidance
3	a			Source	Accuracy	Accessibility	Scientific Terminology	7 2.3.1	
			Excerpt						
			...diacetyl tartaric acid esters of mono- and diglycerides – also known as E472e or DATEM.	A			✓		
			Microbiome volume 9, Article number: 66 (2021).	A		✓			
			16s rRNA sequencing	B	✓				
			An overall systemic wellness score.	B		✓			
			State-of-the-art online interactive platform to view and track your results.	B		✓			
			C-reactive protein (CRP) ...is one of the most sensitive acute-phase markers of inflammation.	C	✓				
			... kits are manufactured within our ISO 13485 certified facility	C	✓				

	b	[Level 3] Candidate shows a high level of understanding and gives a good description of anxiety and misinformation with clear references to people's concerns and the information they are seeking (5 - 6 marks) [Level 2] Candidate shows an understanding of anxiety and misinformation with references to people's concerns and the information they are seeking (3 – 4 marks) [Level 1] Candidate shows a basic understanding of either anxiety or misinformation with limited references to some of people's concerns or the information they are seeking (1 – 2 marks) [Level 0] Candidate response includes fewer than two valid points. (0 marks)	6 2.3.3a,d	Anxiety - related to emotional stress/ worry / fear / uncertainty / mental health / feeling powerless Misinformation - related to incorrect, inaccurate or misleading information that can be easily checked or corrected Concerns: • the effects of additives on health e.g. dysbiosis / metabolic disease • the health of one's microbiome • inflammation in one's body • making informed decisions about diet Information sought by users of services B and C are: • seeking information/diagnosis from blood tests about inflammation • seeking information/diagnosis from stool tests about their microbiome • seeking correct diagnoses from different tests • seeking evidence that changes in diet e.g. reducing consumption of ultra-processed food will improve biomarkers or inflammation markers • seeking dietary advice from experts
	c	partially anonymised ✓	1	
	d	technical: any idea of validating the data user e.g. passwords or encryption of data ✓ organizational: idea of authorisation of individuals or access rights to certain data files ✓	2 4.1a	ALLOW activation link
		Total	16	

Question			Answer	Mark	Guidance
4	a	i	H ✓	1 3.2	
		ii	G ✓	1 3.1	
		iii	B ✓	1 3.1	
		iv	E ✓	1 3.2	
		v	D ✓	1 3.1	
		vi	H ✓	1 3.2	
	b	i	cultural and social factors ✓	1 3.2	
		ii	data subject rights ✓	1 3.2	
		iii	scope and coverage ✓	1 3.2	
		iv	legal frameworks ✓	1 3.2	
		v	enforcement mechanisms ✓	1 3.2	
	c		UNCRPD ✓ information ✓ the internet ✓ a human right ✓	4 3.2	
				15	

Question			Answer	Mark	Guidance
5	a		access – who is authorised (to access the data) ✓ authentication – the passwords / logins / biometrics that verify (the authorised user) ✓	2 4.2a	ALLOW prevents unauthorised people
	b		idea that encryption changes the data to a different form ✓ idea that the (original) data cannot be tampered with in encrypted form / cannot be read without the key ✓	2 4.2c	
	c		any three from ✓✓✓ date / time / timestamps (when accessed) actions performed / downloads / uploads changes made to the data new filenames/extensions for new or modified versions of data purpose of using the data location of access / device used for access	3 4.1b 4.2c	
	d		Any two from: ✓✓ idea of natural disaster e.g. fire / power outage idea of system failure / failure to access server / accidental loss/erasure of data idea of security incident e.g. hacking / denial of service / theft of data / deliberate destruction of data / tampering with data	2 4.2a	

Question			Answer	Mark	Guidance
	e		availability ✓	1 4.1c	
	f		reference to laws / acts / legislation ✓ idea of how individual data is protected e.g. by user permissions ✓	2 4.2c 3.1	
	g		prevents/detects unauthorised access attempts / identifies vulnerabilities/threat detection (that could allow data breaches) / alerts administrators to unexpected activity / flags when updates are required e.g. to security software ✓	1 4.2c	IGNORE keeps data safe / stops hacking
	h		(<i>population</i>) idea that data is collected from a very large number and large diversity of people ✓ (<i>knowledge</i>) accessed from many locations / can be used by many researchers / allows teams of healthcare professionals to collaborate / allows a common format for storage and processing / allows the training/programming of AIs to find patterns/identify anomalies / AVP ✓	2 2.2.5&2	
			Total	15	

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