LEVEL 3 Certificate/Extended Certificate in Applied Science

SCIENCE IN THE MODERN WORLD

Mark Scheme

Unit Number: ASC3 (R/507/6499)
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Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Assessment Writer.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this mark scheme are available from aqa.org.uk

MARKING METHODS

In fairness to candidates, all examiners **must** use the same marking methods. The following advice may seem obvious, but all examiners **must** follow it as closely as possible.

1   If you have any doubt about how to allocate marks to an answer, consult your Team Leader.

2   Refer constantly to the mark scheme and standardising scripts throughout the marking period.

3   Use the full range of marks. Don't hesitate to give full marks when the answer merits them.

4   The key to good and fair marking is **consistency.**

INTRODUCTION

The information provided for each question is intended to be a guide to the kind of answers anticipated and is neither exhaustive nor prescriptive. **All appropriate responses should be given credit.**

Where literary or linguistic terms appear in the Mark Scheme, they do so generally for the sake of brevity. Knowledge of such terms, other than those given in the specification, is **not** required. However, when determining the level of response for a particular answer, examiners should take into account any instances where the candidate uses these terms effectively to aid the clarity and precision of the argument.

DESCRIPTIONS OF LEVELS OF RESPONSE

The following procedure must be adopted in marking by levels of response:

● read the answer as a whole

● work up through the descriptors to find the one which best fits

● where there is more than one mark available in a level, determine the mark from the mark range judging whether the answer is nearer to the level above or to the one below.

Since answers will rarely match a descriptor in all respects, examiners must allow good performance in some aspects to compensate for shortcomings in other respects. Consequently, the level is determined by the 'best fit' rather than requiring every element of the descriptor to be matched. Examiners should aim to use the full range of levels and marks, taking into account the standard that can reasonably be expected of candidates.

SECTION A

			AO1	AO2	AO3
1.0	any **four** from, Source A • lasting pain • pain that spreads (arms and neck), • sickness • shortness of breath Source B • clutching chest • indigestion • pain in muscle / neck / collar bone / chest • keeling over • palpitations • nausea	max three from one source ignore pain unqualified do **not** credit idea of nausea twice	4	4	
2.1	any **one** from, • (so) treatment is given as soon as possible • approximately 50% of (salvageable) heart muscle lost in first hour	 allow half of heart (muscle) survives after the first hour	1		1
2.2	makes the story more 'human'/'real' **or** human interest **or** easier to identify with the person (in the case study) supports/reinforces the information (given in the main article) raise awareness	 allow ref to idea of 'could happen to me/anyone'	1 1 1		3
2.3	any **two** from, • heart attacks look different in men and women • they will be (one of) the first people to meet the heart attack victim • they need to start the treatment sooner • less likely to misdiagnose **or** give correct treatment		2	2	

3.1	33.2 (%)		1		3	
	(564412 ÷ 100 × 33.2 (%) = 187 384.78 / 187 385	allow ecf allow 187 384.78 / 187 385 for 2 marks	1			
	(187384.78 / 187 385 ÷ 9) = 20820.5 / 20821 (women per year)	allow ecf correct answer with or without working gains full marks	1			
3.2	any **three** from, • aimed at different audiences • different style of language • newspaper article more sensational • newspapers can be (more) biased • research paper includes references • research papers have an <u>abstract</u> • research papers are peer reviewed • research paper uses more data / statistics • newspapers (more likely to be) local / national **or** research papers (more likely to be) global	allow for specific examples if clearly described	3			3
4.0	any **two** from, • different factors affect heart disease • takes (a long) time to develop • unethical to try to 'give' someone a heart attack in an experiment		2		2	
5.1	these are all risk factors for heart disease	allow they are factors that affect the condition of the heart	1			2
	(therefore) these are factors to control **or** allows for a (more valid) comparison		1			
5.2	age more likely to get heart attack as you get older **or** sex more men than women have heart attacks **or** past medical history previous heart attacks affect likelihood of future ones	allow other factors with correct explanation	1 1		1	1
6.0	64.1(%)		1		1	
7.0	could affect BHF independence to campaign /		1			2

	lead to bias					
	smoking/tobacco companies undermine the BHF mission / aim		1			
8.0	any **one** from, • pacemaker • stents • defibrillator	ignore ECG, drugs, surgery	1	1		

9	any **four** from, • scientist / researcher submits article • article sent to (anonymous) reviewers (in the same field) • reviewer comments /checks the paper • researcher amends paper (in light of comments) **or** paper is approved (without changes) • cycle is repeated if necessary	allow specific example described e.g. check for clarity, accuracy	4	4		
10	any **two** from, • historical data (2004 – 2013) • changes in treatment practice (since 2004) • changes in technology/technological advances (since 2004) • increased accuracy of diagnosis		2			2

			AO1	AO2	AO3
11.0			9		9

Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also refer to the information on page 3 and apply a 'best-fit' approach to the marking.

0 marks	Level 1 (1–3 marks)	Level 2 (4–6 marks)	Level 3 (7–9 marks)
incorrect no answer	• Uses **1** source and states an advantage or disadvantage • valid points but not clearly linked to an argument structure • discussion shows little attempt at structure • little use of scientific vocabulary	• Uses **at least 2** sources and states advantages and/or disadvantages • argument shows some attempt at structure • Some use of scientific vocabulary	• Uses **3 or 4** sources and states advantages **and** disadvantages • argument well-structured with minimal repetition or irrelevant points • use of specialist vocabulary for science

Examples of the points made in the response

Source	• Advantages	• Disadvantages
A	• Clear and visual diagrams • Simple and easy to understand e.g. headline 'Think quick – act fast' • Can be displayed e.g. in doctors waiting room/seen by lots of middle aged people • from a reputable source/BHF	• Too simplistic if aimed at middle aged adults • Not much actual information or description
B	• Highlights an issue e.g. 'failing to spot heart attacks in women' • Simple structure/language • Not too much data • Read by lots of the general population who are middle aged e.g. 'Daily Mail' • Readers might relate to the personal stories of others of similar age e.g. nurse is aged 49	• Incorrect information on number of cases e.g. quotes 69000 instead of actual figure • might be more worrying than necessary e.g. 'the mistake has driven up death rates by 70%' • key information buried within the article
C	• Lots of facts and figures for those interested/people in the medical profession e.g. statistics • Further reference to additional sources if anyone wants to read more	• Difficult to understand as very technical language for average adults e. g. 'acute myocardial infarction' • Could cause anxiety about misdiagnosis without fully understanding • Not everyone has access to research papers
D	• More reassuring content e. g. 'that grey area of interpretation no longer exists' • Less sensationalised headlines and language e. g. title 'It's already out of date' • Does use scientific data	• Not likely to be read by general public e. g. health.spectator.co.uk not a well-known website

SECTION B

			AO1	AO2	AO3
12.1	any **two** from, • total has stayed about the same/slightly down • charity funding has increased • government funding has decreased	ignore references to cancer / dementia	2		2
12.2	UK has an aging population **or** more people affected		1		1
12.3	387,414,000 (÷ 2 254 000) (=) £171.88 **or** £172	correct answer with or without working gains 2 marks	1 1	2	
12.4	any **three** from, • raising awareness of the disease / charity • charities might get more donations if they have lots of stories • high profile stories might lead to the charity getting more donations • stories about waste/fraud at charity might reduce amount given.	allow any specific example that would raise awareness allow described examples of high profile stories e.g. medical breakthroughs and stories involving famous people	3		3

12.5	any **three** from, • number of people affected • severity of disease • public opinion (about the disease) • research expertise (in the UK) • how imminent a cure / treatment might be any **three** from, • (number of people) more funding should be given to diseases affecting more people **or** better impact on health of the population **or** ref to idea of more value for money • (severity of disease) cost of treating / caring for people with the disease (could put a strain on the NHS) **or** ref to idea of human rights • (public opinion) using taxpayers money to fund the research • (research expertise) is there enough expertise to suggest the researchers might be successful • (how imminent a cure / treatment) ref to idea that worth spending money if a cure is imminent.		3 3			6
13.0	(qualitative) descriptive data (quantitative) numerical data		1 1	2		
14.0	(Pharmacologist) monitoring / studying the effects that the drugs have on the body (Animal technician) looks after the well-being of the animals that are being used to test the drug (Chemist) makes the drug	allow person that tests drug on the animals	1 1 1		3	