GCSE

Specimen Assessment Materials

Human Health and Physiology

For exams June 2011 onwards
For certification June 2011 onwards

Marking Scheme – Foundation Tier

The specimen assessment materials are provided to give centres a reasonable idea of the general shape and character of the planned question papers and mark schemes in advance of the first operational exams.

For operational papers, mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' 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 to download from the AQA Website: www.aqa.org.uk

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Marking Guidance for Examiners
GCSE Science Papers

1 General

The mark scheme for each question shows:

- the marks available for each part of the question
- the total marks available for the question
- the typical answer or answers which are expected
- extra information to help the Examiner make his or her judgement and help to delineate what is acceptable or not worthy of credit or, in discursive answers, to give an overview of the area in which a mark or marks may be awarded.

The extra information is aligned to the appropriate answer in the left-hand part of the mark scheme and should only be applied to that item in the mark scheme.

At the beginning of a part of a question a reminder may be given, for example:
where consequential marking needs to be considered in a calculation;
or the answer may be on the diagram or at a different place on the script.

In general the right hand side of the mark scheme is there to provide those extra details which confuse the main part of the mark scheme yet may be helpful in ensuring that marking is straightforward and consistent.

OWTTE can be used as an abbreviation for 'or words to that effect'

2 Crediting quality of overall response

In questions where there are a number of acceptable responses, the whole answer needs to be considered to ensure that marks that have already been awarded are not contradicted.

3 Emboldening

3.1 In a list of acceptable answers where more than one mark is available 'any **two** from' is used, with the number of marks emboldened. Each of the following lines is a potential mark.

3.2 A bold **and** is used to indicate that both parts of the answer are required to award the mark.

3.3 Alternative answers acceptable for a mark are indicated by the use of **or**. (Different terms in the mark scheme are shown by a / ; eg allow smooth / free movement.)

4 Marking points

4.1 Marking of Quality of Written Communication (QWC)

In some questions candidates will be assessed on using good English, organising information clearly, and using specialist terms where appropriate. Instructions for assessing QWC are given against the appropriate questions in the mark scheme.

4.2 Marking of lists

This applies to questions requiring a set number of responses, but for which candidates have provided extra responses. The general principle to be followed in such a situation is that 'right + wrong = wrong'.

Each error/contradiction negates each correct response. So, if the number of error/contradictions equals or exceeds the number of marks available for the question, no marks can be awarded.

However, responses considered to be neutral (indicated as * in example 1) are not penalised.

Example 1: Name the part of the cell that carries genetic information from parent to offspring (1 mark)

Candidate	Response	Marks awarded
1	chromosome, gamete	0
2	chromosome, cytoplasm	0
3	chromosome, *nucleus	1
4	nucleus*, cytoplasm	0

Example 2: Name the two products of aerobic respiration. (2 marks)

Candidate	Response	Marks awarded
1	Oxygen, carbon dioxide, water	1
2	Oxygen, carbon dioxide, water, nitrogen	0

4.3 Use of chemical symbols / formulae

If a candidate writes a chemical symbol / formula instead of a required chemical name, full credit can be given if the symbol / formula is correct and if, in the context of the question, such action is appropriate.

4.4 Marking procedure for calculations

Full marks can be given for a correct numerical answer, as shown in the column 'answers', without any working shown.

However if the answer is incorrect, mark(s) can be gained by correct substitution / working and this is shown in the 'extra information' column;

4.5 Interpretation of 'it'

Answers using the word 'it' should be given credit only if it is clear that the 'it' refers to the correct subject.

4.6 Errors carried forward

Any error in the answers to a structured question should be penalised once only.

Papers should be constructed in such a way that the number of times errors can be carried forward are kept to a minimum. Allowances for errors carried forward are most likely to be restricted to calculation questions and should be shown by the abbreviation ecf in the marking scheme.

4.7 Phonetic spelling

The phonetic spelling of correct scientific terminology should be credited **unless** there is a possible confusion with another technical term.

4.8 Brackets

(…..) are used to indicate information which is not essential for the mark to be awarded but is included to help the examiner identify the sense of the answer required.

COMPONENT NUMBER: 44151F

COMPONENT NAME: Human Health and Physiology

STATUS: Specimen

DATE: Specimen

question	answers	extra information	mark
1	digestive		1
	breathing		1
	urinary		1
	circulation		1
Total			**4**

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question	answers	extra information	mark
2(a)(i)	**F**		1
2(a)(ii)	**C**		1
2(a)(iii)	**B**		1
2(b)	Marks awarded for this answer will be determined by the quality of written communication.		
	The answer is coherent and in a logical sequence. It contains a range of appropriate or relevant specialist terms used accurately. The answer shows very few errors in spelling, punctuation and grammar. There is a clear and detailed scientific description of the advice that a dietician might give an overweight teenager.		4
	The answer has some structure and the use of specialist terms has been attempted, but not always accurately. There may be some errors in spelling, punctuation and grammar. There is a scientific description of the advice that a dietician might give an overweight teenager.		2–3
	The answer is poorly constructed with an absence of specialist terms or their use demonstrates a lack of understanding of their meaning. The spelling, punctuation and grammar are weak. There is a brief description of the advice that a dietician might give an overweight teenager, which has little clarity and detail.		1
	No relevant content.		0
	Examples of points that may contribute to a candidate's response: • eat less sweets / group A • eat less fat / group B • eat less carbohydrate / group F • eat more fruit / group E • eat more vegetable / group D • eat less 'fast' food • take regular exercise		
Total			**7**

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question	answers	extra information	mark
3(a)	bacteria live / feed on food		1
	bacteria produce acid		1
	acid dissolves / breaks down enamel		1
3(b)	removing plaque owtte	answers such as extraction / filling are insufficient	1
	advice on cleaning teeth		1
Total			**5**

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question	answers	extra information	mark
4(a)	red cell – transports oxygen	two lines from box cancels mark	1
	platelet – helps blood to clot		1
	plasma – carries dissolved urea		1
	white cell – kills bacteria		1
4(b)(i)	**B**		1
	C		1
	A		1
4(b)(ii)	some special solution gets into cells		1
	some special solution gets into the urine		1
4(c)(i)	any **two** from: *Europeans have* • some group AB • less group B • less group O • more group A	accept reverse arguments	2
4(c)(ii)	blood may clot		1
	if recipient given wrong group		1
Total			**13**

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question	answers	extra information	mark
5(a)(i)	protein burned off **or** now no protein present		1
5(a)(ii)	calcium (salts) gone / dissolved in acid		1
5(b)(i)	**A –** cervical **B –** thoracic		1 1
5(b)(ii)	**C** **B**		1 1
5(c)	any **two** from: • hold neck straight • hold back straight • hold abdomen straight		2
Total			**8**

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question	answers	extra information	mark
6(a)	urine 1500 skin 900 lungs 400		1 1 1
6(b)(i)	to cool body owtte		1
6(b)(ii)	less urine produced		1
6(c)(i)	cheaper (than dialysis) patient becomes more independent owtte		1 1
6(c)(ii)	need kidney from relative / donor transplant might be rejected		1 1
Total			**9**

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question	answers	extra information	mark
7(a)	lens – produces clear image on retina		1
	optic nerve – carries information to brain		1
	cornea – allows light to enter eye		1
	sclera – tough, white outer part		1
	suspensory ligament – holds lens in position		1
7(b)(i)	capillaries		1
7(b)(ii)	vision will become blurred owtte		1
7(c)	(the optician / she) can see more of inside of eye		1
Total			**8**

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question	answers	extra information	mark
8(a)	**P** – nucleus		1
	Q – chromosome		1
	R – gene		1
8(b)	ovary		1
	uterus		1
	fertility		1
	contraceptive		1
8(c)(i)	any **two** from: • 99% effective in preventing pregnancy • some protection against women's diseases • periods become more regular		2
8(c)(ii)	any **two** from: • rare but serious side effects • no protection against STD • woman has to remember to take each day		2
8(d)	XY		1
	Y		1
	XY		1
Total			**14**

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question	answers	extra information	mark
9(a)	rib – protects the lungs heart – pumps blood to the lungs diaphragm – flattens to make us breathe in alveoli – where CO_2 leaves the blood	all 4 correct – **3** marks 2 or 3 correct – **2** marks 1 correct – **1** mark	max 3
9(b)	mucous membrane moist – makes air breathed in moist mucous membrane well supplied with blood vessels – makes air breathed in warm lining of air passages has cilia – makes air breathed in clean	all 3 correct – **2** marks 2 or 1 correct – **1** mark	max 2
9(c)(i)	600	correct answer with or without working if answer incorrect / missing, then evidence of 3000 ÷ 5 gains **1** mark	2
9(c)(ii)	oxygen carbon dioxide		1 1
9(c)(iii)	exercise results in deeper breaths owtte		1
9(d)(i)	respiration		1
9(d)(ii)	carbon dioxide water	either order	1 1
Total			**13**

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question	answers	extra information	mark
10(a)	4.5		1
10(b)(i)	medical records / questionnaire to doctors	any other reasonable suggestion	1
10(b)(ii)	any reasonable suggestions eg people close together **or** high populations in cities easier for infection to be transmitted		 1 1
10(c)(i)	antibodies		1
10(c)(ii)	Marks awarded for this answer will be determined by the quality of written communication.		
	The answer is coherent and in a logical sequence. It contains a range of appropriate or relevant specialist terms used accurately. The answer shows very few errors in spelling, punctuation and grammar. There is a clear scientific description of how Method A gives long lasting protection against polio.		4
	The answer has some structure and the use of specialist terms has been attempted, but not always accurately. There may be some errors in spelling, punctuation and grammar. There is a scientific description of how Method A gives long lasting protection against polio.		2–3
	The answer is poorly constructed with an absence of specialist terms or their use demonstrates a lack of understanding of their meaning. The spelling, punctuation and grammar are weak. There is a brief description of how Method A gives long lasting protection against polio, which has little clarity and detail.		1
	No relevant content.		0
	Examples of scientific points that may contribute to a candidate's response: • antibodies remain (for several years) • body continues to make / produce antibodies • if infected with polio, memory cells • quickly produce antibodies		

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Question 10 continued...

question	answers	extra information	mark
10(c)(iii)	tetanus antibodies are soon broken down by the liver	allow immunity lasts for a short time	1
10(c)(iv)	so more antibodies are made		1
10(c)(v)	**one** mark for simple statement eg the person will already have tetanus bacteria in body owtte **second** mark for explanatory statement eg disease would have effect before any antibodies made owtte **or** eg antibodies are specific / will work for one disease but not another owtte	 allow takes a while for antibodies to be made	1 1
10(c)(vi)	injection of ready made antibodies **or** body is given a large amount of antibodies quickly		1
Total			**14**

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question	answers	extra information	mark
11(a)(i)	pH		1
11(a)(ii)	any **two** from: • volume / amount of milk • volume / amount of sodium carbonate solution • volume / amount of enzyme • volume of water		2
11(b)	lipase		1
11(c)	fatty acid		1
11(d)(i)	0.25 **or** $\frac{1}{4}$	correct answer with / without working if answer incorrect / missing, then evidence of $\frac{(8.7 - 7.7)}{4}$ gains **1** mark	2
11(d)(ii)	fats emulsified **or** described in words		1
11(e)	answers such as eg continuous recording more accurate **or** less likelihood of read error		 1 1
Total			**10**

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question	answers	extra information	mark
12(a)	non-identical twins have two placentas **or** a placenta each	allow reverse argument for identical twins	1
	two amnions **or** an amnion each		1
12(b)(i)	obstetricians can sample cells which have broken from skin / body surface of the fetus		1
12(b)(ii)	look for well constructed arguments for and against screening eg any **four** from: For • condition could be treated whilst in womb • fetus with serious problems could be aborted • allows parents to make choices about termination • allows parents to prepare emotionally / financially Against • abortion for trivial condition • might encourage gender selection • procedure might lead to damage / risk to fetus • right to life arguments	see section 2 of the marking guidelines maximum of **3** marks if candidate does not give arguments both for and against screening allow possible harm / risk to mother **or** possibility of miscarriage	4
Total			**7**

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question	answers	extra information	mark
13(a)	$\frac{1}{4}$ **or** 25 %		1
13(b)	12–15 %		1
13(c)	head growth slow leg growth fast	 head grows more slowly than legs gains **2** marks	1 1
13(d)(i)	testes start to produce sperm starting at 12 and extending to 16.5 voice begins to deepen between 14 and 17.75 pubic hair first appears between 11 and 15	 allow ± $\frac{1}{2}$ small square allow ± $\frac{1}{2}$ small square allow ± $\frac{1}{2}$ small square	 1 1 1
13(d)(ii)	puberty generally later in boys than in girls owtte		1
Total			**8**