



GCSE MARKING SCHEME

JANUARY 2016

**SCIENCE B
UNIT 2 - HIGHER TIER
4782/02**

INTRODUCTION

This marking scheme was used by WJEC for the 2016 examination. It was finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conference was held shortly after the paper was taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about this marking scheme.

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Question	Mark Scheme	Mark
1 (a)	ammonium nitrate (1) phosphoric acid (1) ammonium hydroxide (1)	3
(b)	HNO ₃ (1) KOH (1)	2
(c) (i)	23.8	1
(ii)	Reading is out of range/much larger/higher than other readings	1
(d) (i)	20 cm ³	1
(ii)	B A C D All correct (3), 2 or 3 correct (2) 1 correct (1)	3
(e)	pH increases (1) neutralisation occurs / salt formed (1)	2
(f)	25 x X = 0.5 x 22.5 (1) X = 0.5 x 22.5 / 25 (1) X = 0.45 mol/dm ³ (1) Allow ecf	3
2 (a)	11% / 3.6 g / 6	3
(b)	Guidance Daily Amount (1) a recommendation of how much/quantity of a particular food type (1)	2
(c)	use a milk with less fat/use skimmed milk/eat less	1
(d)	increase in protein/ - help growth of baby (linked)	2
(e)	obesity/tooth decay/diabetes 11% / 7.15 g / 6	2

Question	Mark Scheme	Mark
3 (a) (i)	Any three of: liver disease, liver cancer, cancer, diabetes, impotence, infertility, depression, long term social implications	3
(ii)	<p>Indicative content</p> <ul style="list-style-type: none"> • numbers of smokers has dropped • numbers of pupils drinking alcohol dropped • quote numbers or % • publicity / Health campaigns to reduce • ref to awareness of diseases related to smoking/alcohol <p>Marking bands</p> <p>5 - 6 marks. The candidate constructs an articulate, integrated account correctly linking relevant points, such as those in the indicative content, which shows sequential reasoning. The answer fully addresses the question with no irrelevant inclusions or significant omissions. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.</p> <p>3 - 4 marks The candidate constructs an account correctly linking some relevant points, such as those in the indicative content, showing some reasoning. The answer addresses the question with some omissions. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.</p> <p>1 - 2 marks The candidate makes some relevant points, such as those in the indicative content, showing limited reasoning. The answer addresses the question with significant omissions. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.</p> <p>0 marks The candidate does not make any attempt or give a relevant answer worthy of credit.</p>	6
(b) (i)	E-cigarette use vapour containing only nicotine (1)/ no tar/smoke / carbon monoxide found in burning tobacco (1) therefore less carcinogenic (1)/ less (probably) harmful <i>The points must be correctly and coherently connected to be awarded three marks</i>	3
(ii)	may increase nicotine addiction / may lead to tobacco smoking	2

Question	Mark Scheme	Mark
4 (a)	<p>X-energy X rays/ionising radiation are targeted at a tumour/cancer (1) tumour/cancer cells more susceptible to damage / damage the DNA (1) as a result cancer/tumour cells die/reproduce more slowly (1) <i>The points must be correctly and coherently connected to be awarded three marks</i></p>	3
(b)	<p>Indicative content Comparative statements:</p> <p>Similar</p> <ul style="list-style-type: none"> • both forms use radiotherapy uses ionising radiation to kill tumour cells <p>Different</p> <ul style="list-style-type: none"> • external radiotherapy uses external source of X-Rays • patient exposed to more radiation/peripheral exposure IORT • places ionising source in patient (internal) • exposure to less radiation / reduced hospital visits/ less impact on surrounding tissue <p>Marking bands</p> <p>5 - 6 marks. The candidate constructs an articulate, integrated account correctly linking relevant points, such as those in the indicative content, which shows sequential reasoning. The answer fully addresses the question with no irrelevant inclusions or significant omissions. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.</p> <p>3 - 4 marks The candidate constructs an account correctly linking some relevant points, such as those in the indicative content, showing some reasoning. The answer addresses the question with some omissions. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.</p> <p>1 - 2 marks The candidate makes some relevant points, such as those in the indicative content, showing limited reasoning. The answer addresses the question with significant omissions. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.</p> <p>0 marks The candidate does not make any attempt or give a relevant answer worthy of credit.</p>	6
(c)	<p>Any two of: exposed to ionising radiation, cause cancer, mutations</p>	2

Question	Mark Scheme	Mark
5 (a)	$2 / 4Al / 3O_2$ 1 mark Al; 1 mark O_2 ; 1 mark for balancing	3
(b)	at cathode/positive electrode aluminium ions gain electrons /reduced (1) to form aluminium atoms (1) <i>The points must be correctly and coherently connected to be awarded two marks</i>	2
(b)	at anode/negative electrode oxide ions loses electrons / oxidised (1) to form oxygen molecules/the oxygen reacts with the carbon graphite (1) <i>The points must be correctly and coherently connected to be awarded two marks</i>	2
(c)	expensive to produce so saves on energy costs (1) therefore less environmental impact in waste/landfill <i>The points must be correctly and coherently connected to be awarded two marks</i>	2