

GCE

General Studies

Unit **F732/01**: The Scientific Domain

Advanced Subsidiary GCE

Mark Scheme for June 2016

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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.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

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Annotations

Annotation	Meaning of annotation
BP	Blank page – this annotation should be used on all blank pages within the answer booklet and on each page of an additional object where there is no candidate response.
	Correct/valid point
DEV	Development
EG	Example/illustration
REP	Repetition
+	Positive idea/factor/advantage
–	Negative idea/factor/disadvantage
X	Incorrect
EVAL	Evaluation
NAQ	Not answering the question
highlighter	Key point attempted
A3	Communication 3 marks
A2	Communication 2 marks
A1	Communication 1 mark
A0	Communication 0 marks

Subject-specific Marking Instructions**Assessment Objectives**

There are four assessment objectives:

AO1 Demonstrate Knowledge and Understanding applied to a range of issues, using skills from different disciplines:

- showing an understanding of the subject being examined by including accurate factual information
- including information from a range of sources, from different subject areas
- displaying confidence and clarity in the presentation of facts.

AO2 Analysis and Evaluation by marshalling evidence and drawing conclusions; select, interpret, evaluate and integrate information, data concepts and opinions:

- developing and supporting ideas with additional information that enhances and clarifies their meaning
- introducing examples that are selected to support the knowledge being presented
- discussing the validity of ideas through analysis and evaluation .

AO3 Understanding Knowledge by demonstrating an understanding of different types of knowledge, appreciating their strengths and limitations:

- extending the range of knowledge beyond that which is commonly accepted
- considering alternative, and perhaps, less popular, attractive or plausible viewpoints and offering a different perspective
- including personal experience that might support or refute the knowledge and ideas that are being presented.

AO4 Communication in a clear and accurate way while being concise, logical and relevant:

- writing with fluency and accuracy taking account for the technical rules of language
- producing a response that engages the reader and transmits its meaning without ambiguity
- using a range of relevant language and terminology that is appropriate to the topic.

Note that in Section A of this paper, marks for communication are allocated and awarded separately. The following table should be used in the allocation of marks. Further information is included with individual questions:

Where there are **three marks** for Communication, use the following descriptors:

3 marks A3	A very clear response making a case with facility, using a range of appropriate expression and without technical errors
2 marks A2	Most of the response is clear though some aspects may remain unclear due to technical errors that hinder understanding.
1 mark A1	The response is unclear and it is difficult to follow the sense of the argument(s) presented. There are many technical errors.
0 marks A0	This is awarded for no response or when the answer is totally incorrect.

MARK SCHEME: SECTION A

Question			Answer/Indicative content	Mark	Guidance												
1	a	i	15.28 or 3.28 pm 1 mark	1	<p>Assessment Objectives Balance</p> <table border="1"> <thead> <tr> <th></th> <th>AO1</th> <th>AO2</th> <th>AO3</th> <th>AO4</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>1ai</td> <td>2</td> <td></td> <td></td> <td></td> <td>2</td> </tr> </tbody> </table> <p>Do not accept 3.28 as the response should include 'p.m' or b in the 24 hr clock.</p>		AO1	AO2	AO3	AO4	Total	1ai	2				2
	AO1	AO2	AO3	AO4	Total												
1ai	2				2												
1	a	ii	1 hr 38 mins or 98 mins or 1:38 1 mark	1	<p>Accept either hours and mins or only mins Do not accept 1.38 or 1.38 hrs</p>												
1	a	iii	<p>Departs London Euston at 14:00 (2 pm)– arrives Stoke-on-Trent- at 15:25 (3.25 pm) 1 mark</p> <p>Bus departs Stoke-on-Trent at 15:50 (3.50 pm) - arrives Keele University at 16:30 (4.30 pm) 1 mark</p> <p>If for example '4.30' only is seen and the candidate has the correct bus departure time, give credit.</p>	2	<p>Assessment Objectives Balance</p> <table border="1"> <thead> <tr> <th></th> <th>AO1</th> <th>AO2</th> <th>AO3</th> <th>AO4</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>1aii</td> <td>2</td> <td></td> <td></td> <td></td> <td>2</td> </tr> </tbody> </table> <p>1 mark for departure/arrival time of train 1 mark for departure/arrival time of bus</p>		AO1	AO2	AO3	AO4	Total	1aii	2				2
	AO1	AO2	AO3	AO4	Total												
1aii	2				2												
1	a	iv	<p>350/2.25 substituting in distance/ time with time in correct format (hrs/mins) = 155.555...km/h or 156 km/h 1 mark 1 mark 1 mark</p> <p>Or changes km to miles using 5/8 350 x 5/8 = 218.75 218.75 / 2.25 = 97.2 mph or 97 mph 1 mark 1 mark 1 mark</p>	3	<p>Assessment Objectives Balance</p> <table border="1"> <thead> <tr> <th></th> <th>AO1</th> <th>AO2</th> <th>AO3</th> <th>AO4</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>1aiii</td> <td>3</td> <td></td> <td></td> <td></td> <td>3</td> </tr> </tbody> </table> <p>If only the correct answer of : 155.555..km/h or 156 km/h 97.2 mph or 97 mph 2.592 km/min or 2.59 or 2.6 km/min 2592 metres/min or 2590 metres/min 43.2 metres/sec or 43 metres/sec seen award 3 marks</p> <p>1 mark for substitution into speed = distance/time</p>		AO1	AO2	AO3	AO4	Total	1aiii	3				3
	AO1	AO2	AO3	AO4	Total												
1aiii	3				3												

Question		Answer/Indicative content	Mark	Guidance												
		<p>Or using minutes instead of hrs and mins:</p> <p>350/135 substituting distance/ time 1 mark Time in correct format (mins) 1 mark = 2.592.. km/min or 2.6 km/mi 1 mark</p> <p>Or using m 350000/135 1 mark Time correct 1mark 2592 metres/min or 2590 metres/min 1 mark</p> <p>Or changes minutes to sec 135 mins = 8100 secs 350000/8100 1 mark Time correct 1 mark = 43.2 metres/ sec or 43 metres/sec 1 mark</p>		<p>1 mark for time in correct format 1 mark for correct answer</p> <p>Incorrect answers for example: 350/2.15 (the candidate has not converted the time units) will gain a max of 1 mark for the substitution into speed = distance/time</p> <p>A candidate may also use the following method: 350 km in 2.25 hrs 700km in 4.5 hrs 1400 km in 9 hrs 1400/9 = 155.55...km/h or 156 km/h</p>												
1	b	<p>Candidates may include up to three of the following points:</p> <ul style="list-style-type: none"> • Location – London Euston is a very large station used by a variety of commuters but the survey will not reflect the views of all passengers • Time of day – the majority of commuters will be using the station but the survey will not include off-peak commuters • Travellers– will be in a hurry so they may not answer accurately due to lack of patience and time • Weekday – need to have a variety of days for an overall view • Number of interviewers – there would need to be more than one interviewer due to the quantity and times of arrival and departures 	9	<p>Assessment Objectives Balance</p> <table border="1"> <thead> <tr> <th></th> <th>AO1</th> <th>AO2</th> <th>AO3</th> <th>AO4</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>1b</td> <td>2</td> <td>4</td> <td></td> <td>3</td> <td>9</td> </tr> </tbody> </table> <p>6 marks + 3 marks for AO4</p> <p>Award 2 marks for each piece of information (maximum of 3 pieces of information). Total 6 marks</p> <p>Award 1 mark if the piece of information is undeveloped.</p>		AO1	AO2	AO3	AO4	Total	1b	2	4		3	9
	AO1	AO2	AO3	AO4	Total											
1b	2	4		3	9											

Question			Answer/Indicative content	Mark	Guidance												
			<ul style="list-style-type: none"> Genuine travellers – would need to ensure that all of those who are interviewed are genuine travellers rather than passing through the station. Credit any other relevant point. <p>Sample size is not mentioned in the question so do not give credit to comments regarding it unless it is clearly related to the idea that the survey was only completed at a certain time period.</p> <p>Do not credit suggestions to improve the survey, the question is about the unreliability of the given information. Be careful not to allow credit for mention of an ‘unreliable’ survey as that was the question.</p>		<p>Communication</p> <table border="1"> <tr> <td>A3</td> <td>A very clear response making a case with facility, using a range of appropriate expression and without technical errors</td> </tr> <tr> <td>A2</td> <td>Most of the response is clear though some aspects may remain unclear due to technical errors that hinder understanding.</td> </tr> <tr> <td>A1</td> <td>The response is unclear and it is difficult to follow the sense of the argument(s) presented. There are many technical errors.</td> </tr> <tr> <td>A0</td> <td>This is awarded for no response or when the answer is totally incorrect.</td> </tr> </table>	A3	A very clear response making a case with facility, using a range of appropriate expression and without technical errors	A2	Most of the response is clear though some aspects may remain unclear due to technical errors that hinder understanding.	A1	The response is unclear and it is difficult to follow the sense of the argument(s) presented. There are many technical errors.	A0	This is awarded for no response or when the answer is totally incorrect.				
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2	a	i	<p>Electronics 1 mark</p> <p>Travel 1 mark</p>	2	<p>Assessment Objectives Balance</p> <table border="1"> <thead> <tr> <th></th> <th>AO1</th> <th>AO2</th> <th>AO3</th> <th>AO4</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2ai</td> <td>2</td> <td></td> <td></td> <td></td> <td>2</td> </tr> </tbody> </table>		AO1	AO2	AO3	AO4	Total	2ai	2				2
	AO1	AO2	AO3	AO4	Total												
2ai	2				2												
2	a	ii	<p>Allow any differences noted that happen within one group, eg just clothes and sport for example between the age groups. Or any three from the following:</p> <p>1 – overall, the percentages of 3 of the 4 groups purchasing items were the same for Clothes + sport, whereas they are all different for Films + music 2 – overall there are higher percentages of the age groups purchasing Clothes + sport than Films + music. 3 – the smallest difference was for the 25-34 year group 4 – the biggest difference was for the 35-44 year group</p> <p>Some candidates are suggesting points which are in fact similarities not differences. Do not credit these.</p>	3	<p>Assessment Objectives Balance</p> <table border="1"> <thead> <tr> <th></th> <th>AO1</th> <th>AO2</th> <th>AO3</th> <th>AO4</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2aii</td> <td>3</td> <td></td> <td></td> <td></td> <td>3</td> </tr> </tbody> </table> <p>One mark for each difference given</p>		AO1	AO2	AO3	AO4	Total	2aii	3				3
	AO1	AO2	AO3	AO4	Total												
2aii	3				3												

Question		Answer/Indicative content	Mark	Guidance																				
2	b	<p>Candidates may include up to three of the following points:</p> <ul style="list-style-type: none"> • medicines purchased over the internet may be the result of an incorrect personal diagnosis • some internet medicines may be out of date, diluted or include additives • the medicine may have been sent or manufactured in a country where there are fewer controls on medicines • the advertisements for the medicines may have been sent as an e-mail or spam that could persuade the reader that a medicine will dramatically improve their health • the amount of the medicine that can be purchased may be more than normal than if it was prescribed by a doctor in the UK. <p>Credit any other relevant point.</p>	9	<p>Assessment Objectives Balance</p> <table border="1"> <thead> <tr> <th></th> <th>AO1</th> <th>AO2</th> <th>AO3</th> <th>AO4</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2b</td> <td>2</td> <td>4</td> <td></td> <td>3</td> <td>9</td> </tr> </tbody> </table> <p>6 marks + 3 marks for AO4 Award 2 marks for each piece of information (maximum of 3 pieces of information). Total 6 marks Award 1 mark if the piece of information is undeveloped or very brief.</p> <p>Communication</p> <table border="1"> <tbody> <tr> <td>A3</td> <td>A very clear response making a case with facility, using a range of appropriate expression and without technical errors</td> </tr> <tr> <td>A2</td> <td>Most of the response is clear though some aspects may remain unclear due to technical errors that hinder understanding.</td> </tr> <tr> <td>A1</td> <td>The response is unclear and it is difficult to follow the sense of the argument(s) presented. There are many technical errors.</td> </tr> <tr> <td>A0</td> <td>This is awarded for no response or when the answer is totally incorrect.</td> </tr> </tbody> </table>		AO1	AO2	AO3	AO4	Total	2b	2	4		3	9	A3	A very clear response making a case with facility, using a range of appropriate expression and without technical errors	A2	Most of the response is clear though some aspects may remain unclear due to technical errors that hinder understanding.	A1	The response is unclear and it is difficult to follow the sense of the argument(s) presented. There are many technical errors.	A0	This is awarded for no response or when the answer is totally incorrect.
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MARK SCHEME: SECTION B

Question	Answer/Indicative Content	Marks	Guidance
3	<p>This question involves:</p> <ul style="list-style-type: none"> the understanding of the method of investigation suggested an example of this method <p>Indicative content: Personal experience may add strength to the response although it is not essential. The content of the question, image and bullet points should be used to develop ideas. Candidates may refer to an area of research.</p> <ul style="list-style-type: none"> the process consists of a logical approach and has a clear structure. This is vital for research so that every detail and variable is considered highlighting errors in the process should mean that there will be some refinement at each stage research into other scientists' work is very important as it will allow different viewpoints on an issue and also promote collaboration between scientists, possibly on an international level a hypothesis sets the foundation for an investigation. It gives a clear direction. For example, in biology, the question could be 'Do different light colours affect plant growth?' experiments or investigations which fail should be recorded so a good foundation of knowledge is recorded 		<p>Levels of response</p> <p>Level 5 (25-30 Marks)</p> <ul style="list-style-type: none"> very good knowledge of the ways in which a scientist might investigate and report very good development together with a clear reasoned approach and an example extensive discussion of the advantages from different perspectives using personal experience to support the points made very good communication with very clear, concise organisation and expression. <p>Level 4 (19-24 Marks)</p> <ul style="list-style-type: none"> good knowledge of the ways in which a scientist might investigate and report good development together with a reasoned approach with an example good discussion of the advantages using personal experience to support viewpoints good communication with clear organisation and expression. <p>Level 3 (13-18 Marks)</p> <ul style="list-style-type: none"> adequate knowledge of the ways in which a scientist might investigate and report adequate support and development with an example adequate discussion of the advantages with superficial reference to personal experience that may not be clearly linked to the views presented adequate communication with adequate organisation and expression.

Question	Answer/Indicative Content	Marks	Guidance
	<ul style="list-style-type: none"> • analysis of any data will allow the scientist to compare results, for example, using statistics • Credit may be awarded to candidates who make reference to the fact that the experiment is a failure and follow this with the development of this idea. <p>Credit any other relevant point.</p> <p>Candidates who do not refer to an area of research but provide a good range of developed points should be awarded up to a maximum mark of top of level 4, 24 marks.</p> <p>Candidates who only use the bullet points and do not offer development of them should be awarded up to a maximum of 18 marks in Level 3 (adequate knowledge and support).</p>		<p style="text-align: center;">Levels of response</p> <p>Level 2 (7-12 Marks)</p> <ul style="list-style-type: none"> • limited knowledge of the ways in which a scientist might investigate and report • limited support and development that is brief and without expansion; a weak example • limited range of ideas and personal experience to support viewpoints • limited communication with limited organisation and expression. <p>Level 1 (0-6 Marks)</p> <ul style="list-style-type: none"> • very limited knowledge of the ways in which a scientist might investigate and report • very limited development and a weak example, • no discussion that considers the advantages • very limited communication with very limited organisation and expression.

Question	Answer/Indicative Content	Marks	Guidance
4	<p>The question involves:</p> <ul style="list-style-type: none"> • a discussion of why some forecasts are successful • a discussion of why some forecasts are unreliable. <p>It will be unlikely that cogent cases can be made without the use of illustration.</p> <p>Indicative content: Candidates may support their points with one or more examples.</p> <p>Successfully forecasting</p> <ul style="list-style-type: none"> • Equipment is now more sophisticated • thousands of pieces of data can be linked so there is a mass of information available • use of improved communications on the internet • use of computer modelling • different time scales can be used. <p>Unreliable forecasting</p> <ul style="list-style-type: none"> • short term forecasts may be more unreliable • events in other parts of the world may affect us, e.g. fuel costs, sports played abroad • recording equipment may not be sophisticated enough to cope with multiple events • if projections are made from recent events they may not be reliable • incorrect factors may have been used or assumed. 		<p style="text-align: center;">Levels of response</p> <p>Level 5 (25-30 Marks)</p> <ul style="list-style-type: none"> • very good knowledge of the reasons which can make the forecasting events reliable and unreliable • very good development of ideas with a clear, reasoned approach using very good examples • very good discussion from different perspectives using to support the points made • very good communication with very clear, concise organisation and expression. <p>Level 4 (19-24 Marks)</p> <ul style="list-style-type: none"> • good knowledge of the reasons which can make the forecasting of events reliable and unreliable • good development of ideas with a reasoned approach using good examples • good discussion from different perspectives to support the points made • good communication with clear organisation and expression. <p>Level 3 (13-18 Marks)</p> <ul style="list-style-type: none"> • adequate knowledge of the reasons which make the forecasting of events reliable and unreliable • adequate support and development with adequate discussion with some examples • adequate discussion from a single perspective to support the points made in a superficial way • adequate communication with adequate organisation and expression.

Question	Answer/Indicative Content	Marks	Guidance
	<p>Credit any other relevant point.</p> <p>Candidates who do not provide an example but provide a good range of developed points should be awarded up to a maximum mark of top of level 4, 24 marks.</p> <p>Candidates who only discuss either 'reliable' or 'unreliable' (a one sided approach) should be awarded up to a maximum of 18 marks in Level 3.</p>		<p style="text-align: center;">Levels of response</p> <p>Level 2 (7-12 Marks)</p> <ul style="list-style-type: none"> • limited knowledge of the reasons which make forecasting of the events reliable and unreliable • limited support and development that is brief and uses limited examples • limited range of ideas with limited or no alternative perspectives to support viewpoints • limited communication with limited organisation and expression. <p>Level 1 (0-6 Marks)</p> <ul style="list-style-type: none"> • very limited knowledge of the reasons which make the forecasting of the events reliable and unreliable • very limited support and development with no examples • very limited range of ideas with no expansion • very limited communication with very limited organisation and expression.

Question	Answer/Indicative Content	Marks	Guidance
5	<p>This question involves:</p> <ul style="list-style-type: none"> • choosing one area • discussion why the chosen area should be given funding • why the chosen area is preferable to the other areas <p>Indicative content : The following ideas may be used in the chosen area for funding</p> <p>Genetically modified food</p> <ul style="list-style-type: none"> • it can increase crop yields and reduce damage to the crops • make the crops more tolerant of diseases • improve nutritional value of crops • reduce reliance on pesticides and allow crops to be grown in more hostile areas • longer shelf life of products to allow easier shipping • sustainable way to feed increasing population • more texture and flavour <p>Mental Health problems</p> <ul style="list-style-type: none"> • more people now have anxiety related problems, eg anorexia • education on mental health issues could reduce the overall problem • work places often have a mental health effect on people 		<p style="text-align: center;">Levels of response</p> <p>Level 5 (25-30 Marks)</p> <ul style="list-style-type: none"> • very good knowledge of the importance of the chosen area for priority over other areas • very good development together with a clear reasoned approach and a range of relevant examples • extensive discussion of the reasons for increased funding from different perspectives using personal experience to support the points made • very good communication with very clear, concise organisation and expression. <p>Level 4 (19-24 Marks)</p> <ul style="list-style-type: none"> • good knowledge of the importance of the chosen area for priority over other areas • good development together with a clear reasoned approach • good discussion of the reasons for increased funding using personal experience to support viewpoints • good communication with clear organisation and expression. <p>Level 3 (13-18 Marks)</p> <ul style="list-style-type: none"> • adequate knowledge of the importance of the chosen area for priority over other areas • adequate support and development with some examples • adequate discussion of the reasons for increased funding with superficial reference to personal experience that may not be clearly linked to the views presented

Question	Answer/Indicative Content	Marks	Guidance
	<ul style="list-style-type: none"> • it does not just affect the person but also those around eg family • some people are very reluctant/don't want to seek help because of the stigma so funding may be used on counselling <p>Organ transplants</p> <ul style="list-style-type: none"> • this may reduce the cost of long term medication • and possible side effects as the disease/failure of an organ progresses • use could be made of organs which have not ceased to work when someone dies • one donor may improve the lives of several people • living donors can be encouraged to donate, eg blood platelets, kidneys <p>Candidates who do not provide an example but provide a good range of points and development should be awarded up to a maximum mark of top of level 4, 24 marks.</p> <p>The best essays will include discussion of not only why the chosen area should receive funding but also some consideration of why some people may not support such investment.</p>		<p style="text-align: center;">Levels of response</p> <ul style="list-style-type: none"> • adequate communication with adequate organisation and expression. <p>Level 2 (7-12 Marks)</p> <ul style="list-style-type: none"> • limited knowledge of the importance of the chosen area for priority over other areas • limited support and development that is brief and without expansion; a few examples • limited range of ideas and personal experience to support viewpoints • limited communication with limited organisation and expression. <p>Level 1 (0-6 Marks)</p> <ul style="list-style-type: none"> • very limited knowledge of the importance of the chosen area for priority over other areas • very limited development and examples, if any • no discussion that considers the advantages • very limited communication with very limited organisation and expression.

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