

GCE

General Studies

Unit **F732**: The Scientific Domain

Advanced Subsidiary GCE

Mark Scheme for June 2015

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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
	Blank Page – this annotation must be used on all blank pages within an answer booklet (structured or unstructured) and on each page of an additional object where there is no candidate response.
	Correct point
	Development
	Example / reference
	Repetition
Ju	Justification
	Evaluation
	Not answered question
	Communication 3 marks
	Communication 2 marks
	Communication 1 mark
	Communication 0 marks

Subject-specific Marking Instructions

Assessors are expected to fully annotate **all** responses using symbols from the above list. The question rubric will suggest the appropriate annotation to be selected from the menu. In section A, some questions are awarded marks for communication separately (see section 11). For these questions, in addition to adding annotation to indicate the quality of the answer it is necessary to add a separate symbol to indicate the quality of communication. This should be inserted at the end of the answer.

In section B, candidates are required to answer one essay. In addition to accurately annotating the whole response it is necessary to provide a clear comment at the end of the essay. This is inserted into the item level comment box. At the beginning of the comment, assessors must indicate the level which is being awarded.

The mark scheme provides some of the important information that candidates may include in their answers to the questions. It is not definitive or exclusive. Candidates invariably provide additional material or alternative response that may be valid and creditworthy. In this subject, assessors are required to exercise a degree of discretion when considering candidate responses and may, at times, need to use their professional judgement in deciding whether a response should be awarded any marks. General Studies is not exclusively a test of knowledge though candidates are encouraged to use their experience of a wide range of educational experience and actuality in their answers. Assessors are reminded that the extent and level of thinking that has been employed by candidates is the key to unlock the higher level of marks. On the other hand, simple, assertive statements attract little credit. Guidance on the construction of comments can be found in section 11.

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:

NOTE: If a response gains zero marks for content then the AO4 mark is A0

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.

Guidance for Examiners

Stages in marking an essay

- read and **fully annotate** the candidate's response using the question specific annotations found above. Annotation should be placed **in the margin**
- **review** your annotation, and then consider in which **level** the answer is located.
- consider its **position within the level** and **allocate a mark**.

Write a full summative comment to support the marking decision.

The comment must address the main requirements of the question and reveal how well the candidate has tackled these, for example an answer placed in the highest level might receive a comment such as :

Level 5 28

The essay reveals **very good knowledge** and the inclusion of a **range of examples**. These are **developed and explored in detail** and there is clear evidence of **exploring different views and perspectives**. The essay **is written fluently and with accuracy showing displaying an elegant written style**.

- Comments must be made **in addition** to the **AO statements** but **NOT** instead of them.
- Comments should always be **positive and specific** and they must **match the mark and level** which is being awarded
- Comments must be considered **after close reference to the level descriptor** for each individual question.

A weaker answer might receive a comment such as:

Level 2 10

The essay displays **limited knowledge** of the topic and fails to engage with the subject matter. There is **limited explanation and development of ideas and few examples are offered**. The essay is quite assertive **and needs to explore a range of ideas or alternatives**. Weaknesses in expression **hamper the overall clarity**.

Summary

All summative comments must include:

- some reference to the extent and quality of the candidate's knowledge **(AO1)**
- an acknowledgement of how far the knowledge is understood, developed and interpreted with the use of examples **(AO2)**
- how far there has been an examination of different viewpoints and perspectives that challenge the question or knowledge **(AO3)**
- a judgement of the quality and clarity of the essay **(AO4)**.

Question			Answer/Indicative content	Marks	Guidance
1	(a)	(i)	<p>Trends may include:</p> <ul style="list-style-type: none"> • London has the highest number of migrations out of the region • the highest number of migrations into a region is into the south east and south west • more people migrate out of the West Midlands than into the East Midlands • the overall migration rate out of regions is higher. 	2	<p>The question refers to ‘net’ migration. Award 1 mark for each trend identified up to a max of 2 marks Candidates must be clear about the region they are commenting on. Do not accept ‘More people are moving out of the North and into the South’ – this response is not specific enough. Do not accept ‘2724 people moved out of the North East’ A comment simply referring to numbers is not creditworthy, there must be a comparison. Accept ‘ More people are moving out of the North West than the North East’ Or: ‘There are more people moving into of the South East or the South West than out of the East of England’</p>

Question			Answer/Indicative content	Marks	Guidance								
1	(a)	(ii)	<p>It is expected that candidates will focus on the information in Table 1 which relates to the UK.</p> <p>Candidates may include up to three of the following points:</p> <ul style="list-style-type: none"> • age distribution • ethnicity • specific cities/countryside • population density • number of people within families migrating • employment status • birth/death rates • reasons for moving • incentives. <p>Credit any other relevant point.</p>	9	<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 or very brief, for example 'Include the age'</p> <p>Or</p> <p>'What type of people move'</p> <p>Award 2 marks if the piece of information is developed, for example 'If the ages of the people were included then this would help to give a fuller analysis of the moving population. It might also highlight whether the piece of information about moving is age related, for example retirement'.</p> <p>Or</p> <p>'The number of people in a family would be useful to the analysis. Families usually move together, sometimes to be with their extended family or because of employment issues'</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>	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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Question		Answer/Indicative content	Marks	Guidance								
1	(b)	<p>The focus of this question is on environmental reasons. Candidates must explain three environmental reasons which may include:</p> <ul style="list-style-type: none"> • there is a shortage of natural resources, for example, water, crops, fuel and food • some regions consist mainly of desert • mountainous regions are difficult to inhabit • the region may be prone to disease or pests on crops • access to that region may be difficult because of the location • climate of the region. 	9	<p>Award 2 marks for each reason up to a max of 6 marks</p> <p>Award 1 mark if the reason is undeveloped, for example 'There is a shortage of water'</p> <p>Award 2 marks if the reason is developed, for example 'There is a shortage of natural resources such as water and fuel. In these regions it is often difficult to exploit any natural reserves of fuel or to transport them.'</p> <p>Or 'If there is a shortage of water in a region there may also be little or no access to clean water so disease may spread. There may be an economic problem in looking for more water supplies.'</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>	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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Question		Answer/Indicative content	Marks	Guidance
2	(a) (i)	7.3152, 7.315, 7.32, 7.3, 7 metres 2.4384, 2.438, 2.44, 2.4, 2	2	1 mark for each correct answer Do not accept incorrect rounding, for example 7.31 or 2.43
	a ii	Candidates should suggest one of the following: <ul style="list-style-type: none"> the original measurements were whole numbers so that is why I should round my answer to a whole number 2 decimal places (or 3 significant figures)- you cannot measure more accurately and you wouldn't be able to measure to more than parts of a cm on a pitch 2 decimal places for eg 7.32, gives a measurement of 7 metres and 32 cms which are both possible to measure 1 decimal place – this is 1/10th metre which can still be measured on a pitch. 	2	The candidate is expected to show some understanding of the use of decimal places in relation to what they are calculating and measuring. 2 marks if the answer shows a level of accuracy and a clear explanation. 1 mark if there is an indication that the candidate understands the reason for accuracy and measurement but it is not a fully clear explanation 0 marks if they state for example '1 decimal place because it is accurate/easy to remember'
2	b	XYZ XZY YZX YXZ ZXY ZYX There are 6 ways in total.	2	Award 2 marks for a fully correct answer with all correct ways shown Award 1 mark if <u>ONLY</u> a simple statement such as 'There are 6 ways' or '6 ways' is given Or award 1 mark if 5 correct ways are shown. Ignore repeats
2	c	4 marks The candidate used 125 and 75 to calculate 145.77... or 145.8 and states that this is equal to 146 to the nearest whole number and that therefore the corner is a right angle. Or states this is not quite equal to 146 and therefore the angle is not a right angle. 3 marks The candidate used 125 and 75 to calculate 145.77... or 145.8, but does not compare this with 146 and concludes that the angle is not 90 degrees. Or the candidate used 125 and 75 to calculate 145.77... or 145.8 and rounds this to 146, but does not draw a conclusion.	4	1 mark for correct substitution 1 mark for correct answer to square root 1 mark for correct rounding off 1 mark for the statement to confirm that the corner is a right angle (or nearly a right angle) Or a statement which compares their answer to 146 and comes to a conclusion. Alternative approach for 4 marks $125^2 + 75^2 = 21250$ $146^2 = 21316$ These are not equal so it is not a right angle

Question	Answer/Indicative content	Marks	Guidance
	<p>2 marks The candidate calculated the length of the diagonal to be 145.77... or 145.8, but no rounding off or conclusion or explanation was given.</p> <p>1 mark for seeing 125^2+75^2.</p> <p>0 marks No worthwhile work attempted</p>		

Question	Answer/Indicative content	Marks	Guidance
3	<p>This question involves:</p> <ul style="list-style-type: none"> • the recognition of how information can be collected • the recognition of the advantages of using data loggers • an understanding of the advantages to scientists. <p>Indicative content : Candidates may use the examples in the question and suggest why it is an advantage to measure them or they may simply concentrate on the advantages of data loggers rather than other measuring devices.</p> <ul style="list-style-type: none"> • measuring pH values would be helpful for farmers or fisheries • information on radiation levels might be helpful in hospitals or nuclear power stations • movement of animals in places where they may be endangered • continual monitoring would allow scientists to produce data over different time periods • scientists would be able to access places where they could not be physically present eg inside volcanoes, on Mars, or the top of buildings to get readings from a weather station • the accuracy of measurements will be increased, avoiding human error • an increased amount of data will be available as different data loggers can measure several quantities simultaneously. • graphs and tables can be produced more easily as data is automatically saved by the software • statistics will be very accurate as there will have been a large number of measurements taken and recorded. 	30	<p>Level 5 (25-30 Marks)</p> <ul style="list-style-type: none"> • very good knowledge of the advantages of data loggers to scientists • very good development together with a clear reasoned approach and a range of relevant examples • extensive discussion of the advantages from different perspectives using personal experience to support the points made • very clear and logical in communicating ideas and arguments with facility. Few technical errors. <p>Level 4 (19-24 Marks)</p> <ul style="list-style-type: none"> • a good knowledge of the advantages of data loggers to scientists • good development together with a reasoned approach with examples • good discussion of the advantages using personal experience to support viewpoints • clear and logical in communicating ideas and arguments. Some minor technical errors. <p>Level 3 (13-18 Marks)</p> <ul style="list-style-type: none"> • adequate knowledge of the advantages of data loggers to scientists • adequate support and development with some examples • adequate discussion of the advantages with superficial reference to personal experience that may not be clearly linked to the views presented • adequate clarity though there is inconsistency in the presentation of logical arguments. Some technical errors.

Question	Answer/Indicative content	Marks	Guidance
	Situations may include; <ul style="list-style-type: none"> • measuring the speed at which an object is travelling, • the amount of light in a room • the amount of oxygen in a river • the level of noise of aircraft flying over a town. 		<p>Level 2 (7-12 Marks)</p> <ul style="list-style-type: none"> • limited knowledge of the advantages of data loggers to scientists • 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 or brevity which prevents a clear understanding of the ideas presented. Clear technical errors. <p>Level 1 (0-6 Marks)</p> <ul style="list-style-type: none"> • very limited knowledge of the advantages of data loggers to scientists • very limited development and examples, if any • no discussion that considers the advantages • very limited communication skills; many technical errors.

Question	Answer/Indicative content	Marks	Guidance
4	<p>This question involves:</p> <ul style="list-style-type: none"> • an understanding of timescales • choice of one example • discussion of how timescales may be applied to the example. <p>Better management of pollution</p> <ul style="list-style-type: none"> • short term might include instant fines for industries found polluting or car free areas within towns and cities • medium term may include more taxes on the use of roads or incentives for industry to promote the use of greener energy • long term may include better provision of public transport so cars are not polluting towns/cities on a daily basis. Possibly 'car free days' as used in some places and countries. With further research new, cleaner and greener forms of energy could be tested and implemented. <p>Disease control</p> <ul style="list-style-type: none"> • short term may include the initial monitoring of a small group of patients although this may not be effective because of the nature of the disease which may be aggressive • medium and long term would imply that a larger more variant group might be considered and cooperation between many more medical agencies would be needed • long term would be the hardest approach because of the disease, monitoring long term would be very difficult • difficult because of the many factors which might have to be included depending on the nature of the disease, for example an epidemic. 	30	<p>Level 5 (25-30 Marks)</p> <ul style="list-style-type: none"> • very good knowledge of the use of different timescales • very good development together with a clear reasoned approach and a range of relevant examples • extensive discussion of the different timescales from different perspectives using personal experience to support the points made • very clear and logical in communicating ideas and arguments with facility. Few technical errors. <p>Level 4 (19-24 Marks)</p> <ul style="list-style-type: none"> • a good knowledge of the of different timescales • good development together with a reasoned approach with examples • good discussion of the use of different timescales using personal experience to support viewpoints • clear and logical in communicating ideas and arguments. Some minor technical errors. <p>Level 3 (13-18 Marks)</p> <ul style="list-style-type: none"> • adequate knowledge of the use of different timescales • adequate support and development with some examples although maybe only two timescales involved • adequate discussion of the use of different timescales with superficial reference to personal experience that may not be clearly linked to the views presented • adequate clarity though there is inconsistency in the presentation of logical arguments. Some technical errors.

Question	Answer/Indicative content	Marks	Guidance
	<p>Fertility control</p> <ul style="list-style-type: none"> • short term might include the donation of contraceptive devices although there needs to be instant information available for their use in some areas of the world • medium term might include more education in developing countries especially for females who might be in a vulnerable group because of their ethnicity or religion • long term might include the setting up of a one child policy such as that used in China or the use of rewards for keeping a family to a small number. <p>Generally</p> <p>Answers will include reference to</p> <ul style="list-style-type: none"> • the many factors involved over the timescales • the cost and whether the quick fix of a short term solution is better than waiting for years for the long term solution to come into effect • the monitoring of the results from the timescale and the accessibility of the results • that the effectiveness might depend on which part of the world was being considered or the cost involved. 		<p>Level 2 (7-12 Marks)</p> <ul style="list-style-type: none"> • limited knowledge of the use of different timescales • 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 or brevity which prevents a clear understanding of the ideas presented. Clear technical errors. <p>Level 1 (0-6 Marks)</p> <ul style="list-style-type: none"> • very limited knowledge of the use of different timescales • very limited development and examples, if any • no discussion that considers the different timescales • very limited communication skills; many technical errors.

Question	Answer/Indicative content	Marks	Guidance
5	<p>This question involves</p> <ul style="list-style-type: none"> • a consideration of the environmental problems • the ways to manage each of these effects. <p>Problems</p> <ul style="list-style-type: none"> • In the coastal areas and river corridors there may be increased flooding and erosion more air pollution, especially from nearby roads, cars and industries, affecting wildlife and crops • increased usage of the area and the effects on the soil in particular • warmer weather may give rise to a higher risk of moorland fires • wildlife habitats may be endangered by a change of weather patterns • farming within the park may be threatened as growing conditions for crops may be altered after adverse weather. • <p>To manage the problems National Parks could</p> <ul style="list-style-type: none"> • control flooding by creating areas for floodwater or building better flood defences on the coasts • invest in more renewable energy so less CO₂ emitted - this will help them to commit to be more carbon neutral • work with remote rural communities to reduce energy use in the area and therefore reduce any local air pollution • create more woodlands within the parks as trees absorb the CO₂ as they grow. <p>The focus of the question should be on the National Parks and their problems and management, not a general discussion of effects. The map should help candidates pinpoint inland and coastal areas as prompts.</p>	30	<p>Level 5 (25-30 Marks)</p> <ul style="list-style-type: none"> • very good knowledge of the environmental problems faced and their management • very good development together with a clear reasoned approach and a range of relevant examples • extensive discussion of the environmental problems and their management from different perspectives using personal experience to support the points made • very clear and logical in communicating ideas and arguments with facility. Few technical errors. <p>Level 4 (19-24 Marks)</p> <ul style="list-style-type: none"> • a good knowledge of the environmental problems and their management • good development together with a reasoned approach with examples • good discussion of the environmental problems and their management using personal experience to support viewpoints • clear and logical in communicating ideas and arguments. Some minor technical errors. <p>Level 3 (13-18 Marks)</p> <ul style="list-style-type: none"> • adequate knowledge of the environmental problems and their management • adequate support and development with some examples • adequate discussion of the environmental problems and their management with superficial reference to personal experience that may not be clearly linked to the views presented • adequate clarity though there is inconsistency in the presentation of logical arguments. Some technical errors.

Question	Answer/Indicative content	Marks	Guidance
	<p>Any examples given will support the candidates' responses but they are not essential.</p> <p>Candidates may respond to the question from different viewpoints for example from the community viewpoint or from that of the management system of the National Park.</p>		<p>Level 2 (7-12 Marks)</p> <ul style="list-style-type: none"> • limited knowledge of the environmental problems and their management • 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 or brevity which prevents a clear understanding of the ideas presented. Clear technical errors. <p>Level 1 (0-6 Marks)</p> <ul style="list-style-type: none"> • very limited knowledge of the environmental problems and their management • very limited development and examples, if any • no discussion that considers the advantages • very limited communication skills; many technical errors.

OCR (Oxford Cambridge and RSA Examinations)
1 Hills Road
Cambridge
CB1 2EU

OCR Customer Contact Centre

Education and Learning

Telephone: 01223 553998

Facsimile: 01223 552627

Email: general.qualifications@ocr.org.uk

www.ocr.org.uk

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OCR (Oxford Cambridge and RSA Examinations)
Head office
Telephone: 01223 552552
Facsimile: 01223 552553

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