

General Studies

Advanced Subsidiary GCE

Unit **F732**: The Scientific Domain

Mark Scheme for June 2012

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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.

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Annotations

Annotation	Meaning
Yes	recognises a point worthy of credit
Dev	a developed point or development of a point
No	a content error
NAQ	not answering the question
eg	appropriate example
SP/G/Eng	spelling, grammar and language error; you are not expected to correct all of them
(...)	indicates a choice or a key phrase
Rubric	rubric infringement
D	description
R	reason
Rep	repetition, often of the question
Ev	evaluation

Subject-specific Marking Instructions

Do not use ticks in Section B.

Stages to an essay mark

Read and annotate the candidate's response.

Consider its position within the level and a possible mark.

Write a one or more line comment reflecting the AO statements.

eg	AO1	good knowledge very limited knowledge and eg
	AO2	examples given
	AO3	personal experience relevant restricted personal experience
	AO4	clearly written inaccurate Spg

Enter the final mark in a circle.

Assessment Objectives**AO1 Demonstrate Knowledge and Understanding**

- Demonstrate relevant knowledge and understanding applied to a range of issues, using skills from different disciplines;

AO2 Analysis and Evaluation

- Marshal evidence and draw conclusions; select, interpret, evaluate and integrate information, data concepts and opinions;

AO3 Understanding and Knowledge

- Demonstrate understanding of different types of knowledge, appreciating their strengths and limitations;

AO4 Communication

- Communicate clearly and accurately in a concise, logical and relevant way.

Question		Answer	Marks	Guidance
1	(a)	<p>Potential sources of inaccuracy include:</p> <ul style="list-style-type: none"> • difficulty in marking the levels of water accurately on the side of the bath (movement of water, time for John to hold breath) • difficulty in deciding when John's body is 'fully immersed' (lie on back/on side, toes pointing up/sideways, etc) • difficulty in defining the extent of his 'head' when lifting out of the water (chin/neck/shoulders) • inaccuracy of using the 5 litre container. 	7	<p>3 reasons at 2 marks each.</p> <p>1 mark for identification and 1 mark for its development plus 1 mark for AO4.</p> <p>AO4 – 1 mark (award if meaning is clear)</p> <p>Where 0 marks are awarded for content 0 marks must be awarded for AO4.</p>
	(b)	<ul style="list-style-type: none"> • use smaller container (or container with measures marked) to refill bath – record volumes more accurately • before John gets into the bath, mark sides of the bath more accurately using measured volumes of water • reverse sequence – start with bath full to overflow level; collect and measure water displaced through overflow pipe as John immerses (1) to the neck, (ii) completely • use upright cylinder rather than bath, so that John can stand rather than lying (easier to define 'head') • repeat experiment and take averages. 	5	<p>2 ways at 2 marks each plus 1 mark for AO4.</p> <p>AO4 – 1 mark (award if meaning is clear)</p> <p>Where 0 marks are awarded for content 0 marks must be awarded for AO4.</p>

Question			Answer	Marks	Guidance
2	(a)	(i)	From Table 1 As the mass increases (1 mark) the period of swing hardly changes (1 mark)/There is some slight variation eg quotes evidence (1 mark).	3	2 marks plus 1 mark for AO4. AO4 – 1 mark (award if meaning is clear). Where 0 marks are awarded for content 0 marks must be awarded for AO4.
		(ii)	From Table 2 As the length increases (1 mark) the period of swing increases (1 mark)/Not an apparently direct correspondence eg quotes evidence (1 mark).	3	2 marks plus 1 mark for AO4. AO4 – 1 mark (award if meaning is clear). Where 0 marks are awarded for content 0 marks must be awarded for AO4.
	(b)		$T = 2\text{sec}$ $l = 100 \text{ cm}$ $2 = 2\pi\sqrt{100/g}$ substitution $2/2\pi = \sqrt{(100/g)}$ rearrange $1/\pi^2 = 100/g$ squared $g = \pi^2 \times 100$ simplified answer in range 985 - 988	6	A correct answer in the range 985 to 988 will be worth 6 marks . 1 mark for correct substitution. 1 mark for attempt to re-arrange equation. 1 mark for attempt to square. 1 mark for attempt to simplify further. Incorrect substitution but followed through maximum 3 marks . Examiners will find some candidates using alternative routes to the answer. These should be read carefully and credited for the steps taken.

Question		Answer	Marks	Guidance
	(c)	<p>Reasons include:</p> <ul style="list-style-type: none"> • not in a vacuum • simple/more sophisticated apparatus • g varies on earth • environmental factors eg air movement. <p>Change of units/accuracy is not an issue for reward.</p>	6	<p>Two reasons at 2 marks each and up to 2 marks for AO4.</p> <p>Awarding AO4 marks</p> <p>2 marks – meaning is clear with very few errors of SPG. 1 mark – meaning is mainly clear with some errors of SPG. 0 marks – meaning is not clear or frequent errors of SPG.</p> <p>Where 0 marks are awarded for content 0 marks must be awarded for AO4.</p>

Question	Answer	Marks	Guidance
3	<p>This question involves:</p> <ul style="list-style-type: none"> • recognition of the context of the question • appropriate suggestion for each of the groups • recognition of potential conflicts of interest • resolution of potential conflicts of interest. <p>Indicative content</p> <p>Recognition of context of the question</p> <ul style="list-style-type: none"> • an idea of the quarry site • area of water • understanding the surrounding area and vegetation change. <p>Suggestions for design points for each user group</p> <p>A level students:</p> <ul style="list-style-type: none"> • use of shallow area to study pond life • vegetation invasion on drier area • invasive areas of vegetation at waters edge • hides and observation areas • coach parking. <p>Leisure activities for young and old:</p> <ul style="list-style-type: none"> • varies with age group • café and toilets • access to water for sailing and other boats • fishing • walks, sculpture areas and places of interest • car parking. 	30	<p>Recommended Annotation</p> <p>Intro for introduction. A for design points about the area for field investigations by A level students. L for design points about the area for leisure for young and old. C for design points about the commercial and retail area. Con1, Con2 ... etc for points of conflict. Res 1, Res2.... for ideas for resolution of conflicts. Conc. for conclusion.</p> <p>These descriptors are intended as a first guide to examiners. They indicate the characteristics of a top of a level answer. Marks within a level are awarded when an answer does not include all the parts or qualities shown in the descriptor. Answers which are ‘border line’ should be awarded the lowest mark in the level.</p> <p>Maximum top of Level 3 if only 3 of the 4 parts of the question are answered.</p> <p>Level 5 (25–30 marks) These answers will provide very good developed responses to the four parts of the question, particularly the ways to resolve conflicts (AO1 and AO2). Answers will include developed material linked to AO3 eg examples, personal experience or discussion of definitions. In terms of AO4 (communication), these answers will be clear, well structured and written with facility.</p> <p>Level 4 (19–24 marks) These answers will provide good responses to the four parts of the question and two of these will be developed (AO1 and AO2). Answers will include material linked to AO3 eg examples, personal experience or discussion of definitions. In terms of AO4 (communication), these answers will be clear and well structured.</p>

Question	Answer	Marks	Guidance
	<p>Commercial and retail industries:</p> <ul style="list-style-type: none"> • access • extensive parking • storage area • landscaping to hide from view • appropriate architecture. <p>Conflicts of interest include:</p> <ul style="list-style-type: none"> • traffic • noise • visual intrusion • litter • lake pollution • boundary conflicts. <p>Resolutions of conflicts include:</p> <ul style="list-style-type: none"> • managed car parking • managed litter bins • designated paths and public access points • hides and observation areas • sympathetic building design. 		<p>Level 3 (13–18 marks) These answers will provide adequate responses to three of the four parts of the question and one will be developed (AO1 and AO2). Answers will include some material linked to AO3 eg examples, personal experience or discussion of definitions. In terms of AO4 (communication), these answers will be clear but contain errors of spelling, punctuation and grammar. The structure will be modest.</p> <p>Level 2 (7–12 marks) These answers will provide limited responses to three parts of the question (AO1 and AO2). Answers will include limited material linked to AO3 eg examples, personal experience or discussion of definitions. In terms of AO4 (communication), the clarity of these answers will be insecure and their command of spelling, punctuation and grammar as well as structure will be limited and inaccurate.</p> <p>Level 1 (0–6 marks) These answers will provide very limited responses to three parts of the question (AO1 and AO2). Answers will include very limited fragments of material linked to AO3 eg examples, personal experience or discussion of definitions. In terms of AO4 (communication), these answers will be unclear with poor sentence structure with errors of grammar and spelling.</p>

Question	Answer	Marks	Guidance
4	<p>This question involves:</p> <ul style="list-style-type: none"> • recognition that the focus of the question is on the control of birth rates • describing the disadvantages of contraceptive devices • describing the disadvantages of allowing couples only one child • describing the disadvantages of allowing termination of pregnancies. <p>Indicative content</p> <p>Scene setting on the back ground is acceptable but not essential.</p> <p>Disadvantages of contraceptive devices:</p> <ul style="list-style-type: none"> • element of risk • unsatisfactory intercourse • costs • health risk • availability • absence at time of need. 	30	<p>Recommended annotation</p> <p>Intro for introduction. C for disadvantages of contraceptive methods. O for disadvantages of one child policy. T for disadvantages of a termination strategy. Conc. for conclusion.</p> <p>These descriptors are intended as a first guide to examiners. They indicate the characteristics of a top of a level answer. Marks within a level are awarded when an answer does not include all the parts or qualities shown in the descriptor. Answers which are 'border line' should be awarded the lowest mark in the level.</p> <p>Level 5 (25–30 marks) These answers will include very good well developed accounts of the disadvantages of each of the birth rate control strategies (AO1 and AO2). Answers will include developed material linked to AO3 eg examples, personal experience or discussion of definitions. In terms of AO4 (communication), these answers will be clear, well structured and written with facility.</p> <p>Level 4 (19–24 marks) These answers will include good developed accounts of the disadvantages of each of the birth rate control strategies (AO1 and AO2). Answers will include material linked to AO3 eg examples, personal experience or discussion of definitions. In terms of AO4 (communication), these answers will be clear and well structured.</p> <p>Level 3 (13–18 marks) These answers will include adequate accounts of the disadvantages of each of the birth rate control strategies (AO1 and AO2). Answers will include some material linked to AO3 eg examples, personal experience or discussion of definitions. In terms of AO4 (communication), these answers will be clear but contain errors of spelling, punctuation and grammar. The structure will be modest.</p>

Question	Answer	Marks	Guidance
	<p>Disadvantages of one child policy: (as used for a time in China)</p> <ul style="list-style-type: none"> • monitoring • what happens to second child • forms of punishment • dangers of girl babies being killed or abandoned • community police • ‘spoiled’ boy children • shortage of females in later years. <p>Disadvantages of allowing termination of pregnancy:</p> <ul style="list-style-type: none"> • casual intercourse • religious objections • dangers to mother • expensive • challenge for medical profession. 		<p>Level 2 (7–12 marks) These answers will include limited accounts of the disadvantages of two of the three birth control methods (AO1 and AO2). Answers will include limited material linked to AO3 eg examples, personal experience or discussion of definitions. In terms of AO4 (communication), the clarity of these answers will be insecure and their command of spelling, punctuation and grammar as well as structure will be limited and inaccurate.</p> <p>Level 1 (0–6 marks) These answers will include very limited accounts of the disadvantages of two of the three birth control methods (AO1 and AO2). Answers will include very limited fragments of material linked to AO3 eg examples, personal experience or discussion of definitions. In terms of AO4 (communication), these answers will be unclear with poor sentence structure with errors of grammar and spelling.</p>

Question	Answer	Marks	Guidance
5	<p>This question involves:</p> <ul style="list-style-type: none"> • recognising the aim of a forecast • suggesting reasons for forecasting being inaccurate • identifying two examples of forecasting. <p>Indicative content</p> <p>Examples of forecasting include:</p> <ul style="list-style-type: none"> • results of an experiment • demographic forecasts of population size • statistical investigations • natural disasters. <p>Reasons for inaccuracy in forecasts include:</p> <ul style="list-style-type: none"> • quality of data • often projections from past events • model used proves flawed • wrong balance of variable factors • un-seasonal weather • new factors that were not anticipated • biased for a particular outcome • small changes may have large effects eg the butterfly syndrome. 	30	<p>Recommended annotation</p> <p>Intro for introduction. E.G.1 and E.G.2 for the two chosen examples (they may be taken from the list given in the question). R1, R2, R3... for reasons for inaccuracy. Dev. for development of points. Conc. for conclusion.</p> <p>These descriptors are intended as a first guide to examiners. They indicate the characteristics of a top of a level answer. Marks within a level are awarded when an answer does not include all the parts or qualities shown in the descriptor. Answers which are 'border line' should be awarded the lowest mark in the level.</p> <p>Level 5 (25–30 marks) These answers will use very good well developed reasons for the inaccuracies of forecasts. (AO1 and AO2). They will make well developed reference to two different types of forecast. Answers will include developed material linked to AO3 eg examples, personal experience or discussion of definitions. In terms of AO4 (communication), these answers will be clear, well structured and written with facility.</p> <p>Level 4 (19–24 marks) These answers will use good developed reasons for the inaccuracies of forecasts. (AO1 and AO2). They will make developed reference to two different types of forecast. Answers will include material linked to AO3 eg examples, personal experience or discussion of definitions. In terms of AO4 (communication), these answers will be clear and well structured.</p> <p>Level 3 (13–18 marks) These answers will use adequate reasons for the inaccuracies of forecasts (AO1 and AO2). They will make adequate reference to one or two different types of forecast. Answers will include some material linked to AO3 eg examples, personal experience or discussion of definitions. In terms of AO4 (communication), these answers will be clear but contain errors of spelling, punctuation and grammar. The structure will be modest.</p>

Question	Answer	Marks	Guidance
			<p>Level 2 (7–12 marks) These answers will use limited reasons for the inaccuracies of forecasts. (AO1 and AO2). They will make limited reference to one or two different types of forecast. Answers will include limited material linked to AO3 eg examples, personal experience or discussion of definitions. In terms of AO4 (communication), the clarity of these answers will be insecure and their command of spelling, punctuation and grammar as well as structure will be limited and inaccurate.</p> <p>Level 1 (0–6 marks) These answers will use very limited reasons for the inaccuracies of forecasts. (AO1 and AO2). They will make very limited reference to one or two different types of forecast. Answers will include very limited fragments of material linked to AO3 eg examples, personal experience or discussion of definitions. In terms of AO4 (communication), these answers will be unclear with poor sentence structure and errors of grammar and spelling.</p>

APPENDIX 1

Assessment Objective Weighting

	AO1	AO2	AO3	AO4
Marks	8	10	6	6

Generic Mark Scheme for Questions with 30 marks

Level 5

AO1	<ul style="list-style-type: none"> select, use and integrate a very good range of relevant knowledge show a good understanding of the concepts involved 	25–30
AO2	<ul style="list-style-type: none"> interpret and analyse issues and problems well and evaluates them appropriately use evidence to develop complex reasoned arguments and draw sound conclusions on the evidence 	
AO3	<ul style="list-style-type: none"> demonstrate very good awareness of the differences between types of knowledge have a very good appreciation of the strengths and limitations of the different types of knowledge 	
AO4	<ul style="list-style-type: none"> communicate complex ideas clearly and accurately, using specialist vocabulary where appropriate, in a concise, logical and relevant way use a wide range of the rules of grammar, punctuation and spelling with accuracy and facility. 	

Level 4

AO1	<ul style="list-style-type: none"> select, use and integrate a good range of relevant knowledge show an understanding of the concepts involved 	19–24
AO2	<ul style="list-style-type: none"> interpret and analyse issues and problems well and evaluates them competently use evidence to develop reasoned arguments and draw sound conclusions on the evidence 	
AO3	<ul style="list-style-type: none"> demonstrate good awareness of the differences between types of knowledge have a good appreciation of the strengths and limitations of the different types of knowledge 	
AO4	<ul style="list-style-type: none"> communicate ideas clearly and accurately, using specialist vocabulary where appropriate, in a concise, logical and relevant way use a range of the rules of grammar, punctuation and spelling with accuracy and facility. 	

Level 3

AO1	<ul style="list-style-type: none"> select, use and integrate a range of relevant knowledge show an adequate understanding of the concepts involved 	13–18
AO2	<ul style="list-style-type: none"> undertake some interpretation and analysis of issues and problems and make a superficial evaluation use evidence to develop arguments and draw conclusions 	
AO3	<ul style="list-style-type: none"> demonstrate awareness of the differences between types of knowledge have an appreciation of the strengths and limitations of the different types of knowledge 	
AO4	<ul style="list-style-type: none"> communicate clearly, using some specialist vocabulary with facility use some of the rules of grammar, punctuation and spelling with facility. 	

Level 2

AO1	<ul style="list-style-type: none"> select, use and integrate a limited range of relevant knowledge show a modest understanding of the concepts involved 	7–12
AO2	<ul style="list-style-type: none"> demonstrate limited interpretation and analysis of issues and problems with limited evaluation use evidence to develop limited arguments and draw limited conclusions 	
AO3	<ul style="list-style-type: none"> demonstrate limited awareness of the differences between types of knowledge have a restricted appreciation of the strengths and limitations of the different types of knowledge 	
AO4	<ul style="list-style-type: none"> communicate ideas with limited clarity, using some specialist vocabulary use some rules of grammar, punctuation and spelling. 	

Level 1

AO1	<ul style="list-style-type: none"> select, use and integrate some knowledge which may not be accurate show a restricted understanding of the concepts involved 	0–6
AO2	<ul style="list-style-type: none"> demonstrate poor interpretation and analysis of issues, problems and evaluation recognise arguments and conclusions 	
AO3	<ul style="list-style-type: none"> demonstrate very limited awareness of the differences between types of knowledge have a very restricted appreciation of the strengths and limitations of the different types of knowledge 	
AO4	<ul style="list-style-type: none"> communicate with little clarity using occasional specialist terms use poor grammar and punctuation, and inaccurate spelling. 	

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