

GCE

General Studies

Advanced Subsidiary GCE

Unit F732: The Scientific Domain

Mark Scheme for January 2012

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of candidates of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, OCR Nationals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support, which keep pace with the changing needs of today's society.

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.

© OCR 2012

Any enquiries about publications should be addressed to:

OCR Publications PO Box 5050 Annesley NOTTINGHAM NG15 0DL

Telephone: 0870 770 6622 Facsimile: 01223 552610

E-mail: publications@ocr.org.uk

Annotations

Use the following annotations. (In any one script you are not expected to use all of these.)

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.

Quest	ion	Answer	Marks	Guidance
1 (a)		The correct answer is D (2 marks) 2 marks for reasons (any two of the following) Ball travels north at decreasing speed (1 mark) Ball stops (1 mark) Ball travels south at increasing speed (1 mark).	4	An incorrect choice can gain up to 2 marks if the answer includes a correct description of the motion of the ball.
(b)	(i)	Description or drawing indicates steeper gradient - ball reduces velocity more quickly (1 mark). Description or drawing indicates shorter time span (1 mark). Shorter distance up the slope (1 mark).	4	Examiners should concentrate on the movement of the ball in the new circumstances If a graph is used it should be labelled correctly. AO4 - 1 mark (award if meaning is clear). Where there are 0 marks awarded for content 0 marks must be awarded for AO4.
	(ii)	Description or drawing indicates higher initial velocity (1 mark). Description or drawing indicates increased time span until stationary (1 mark). Moves further up the slope (1 mark).	4	Examiners should concentrate on the movement of the ball in the new circumstances AO4 - 1 mark (award if meaning is clear). Where there are 0 marks awarded for content 0 marks must be awarded for AO4.
(c)		Uses might include:	6	1 mark for use and 1 mark for explanation for each use plus 2 marks for AO4. Awarding AO4 marks 2 marks - Meaning is clear with very few errors of SPG. 1 mark - Meaning partially clear with some errors of SPG. 0 marks - Meaning is not clear or frequent errors of SPG. Where there are 0 marks awarded for content 0 marks must be awarded for AO4.

Question	Answer	Marks	Guidance
(d)	 Examples include: fairground rides eg helter skelter, big dipper slides in playgrounds and swimming pools water through the overflow of a dam sloping roofs chutes for rubbish in flats and building sites. Explanation will be in terms of using the mass/weight of an object and the pull of gravity to do the work.	2	mark for example and 1 mark for explanation. Examiners should credit valid alternatives.

C	uestion	Answer	Marks	Guidance
2	(a)	Volume of water in the sphere is $ (4/3) \times \pi \times r_s^3 = (4/3) \times (22/7) \times 3^3 = 2376/21 $ $= 113.14 \text{ cubic cms} $ So $V_c = 113.14 \text{ cubic cms} $ $ 113.14 = \pi \times R_c^2 \times H_c = 22/7 \times 2^2 \times H_c $ $ H_c = 113.14/(\pi \times 4) = 8.999 = 9.0 \text{ cm(small calculator rounding error)} $ A more mathematical way would be $ (4/3) \pi (3^3) = \pi (2^2) H_c $ The π cancels out to give $Hc = 36/4 = 9 \text{ cm} $	6	 mark for correct numbers in volume of sphere. mark for correct volume of sphere. mark for correct numbers in volume of cylinder. mark for equating the volumes. mark for correct units (cm or centimetres if working out has been shown). If a candidate makes an error this can be carried forward to a maximum of 4 marks. If no working out is shown a correct answer of 9 cm can be awarded 6 marks.
	(b)	For 2 marks (max) accept a statement about the curved edge of the sphere/ change in radius of sphere (1 mark) making the volume increase (1 mark) in a non uniform way (1 mark). Once the sphere is half full the equation reverses (1 mark).	4	Examiners should be looking to award marks when the candidate has a clear conception of the way the sphere fills. Examiners may credit explanations involving the use of a diagram. Examiners may note that integral calculus is needed to calculate the cubic equation for the height filled in the sphere. However, this is not expected of candidates. Some following a mathematics course may go down this line. Allow 2 marks for clarity of communication (AO4). Awarding AO4 marks 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. Where there are 0 marks awarded for content 0 marks must be awarded for AO4.

Assessment Objectives balance						
AO1	AO2	AO3	AO4			
8	10	6	6			

Question	Answer	Marks	Guidance
			Levels of response
3	 This question involves: recognition of the broad aims of conservation projects examining the advantages of these projects to local people examining the disadvantages of these projects for local people. Aims of conservation projects include: preservation and careful management of the environment and of natural resources sustainable ideas to meet the needs of this generation without prejudice to future generations maintaining the health of the natural world: its, fisheries, habitats, and biological diversity recognising the natural and human dimensions. Advantages of the projects for local people include: introduction of technology experience of new skills investment in infrastructure water supply sustainable farming/development medical care. Disadvantages of the projects for local people include: cultural incongruence new diseases 	30	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. Level 5: (25 – 30 Marks) These answers will include two well developed advantages and two well developed disadvantages (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. Level 4: (19 – 24 Marks) These answers will include two advantages and two disadvantages. Two of the four 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. Level 3: (13 – 18 Marks) These answers will include two advantages and two disadvantages. One of the four 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.

Question	Answer Ma		Guidance
			Levels of response
	 increases wants rather than needs projects collapse when external support ends local may leave for new horizons. 		Level 2: (7 – 12 Marks) These answers will include three of the four advantages/disadvantages asked for in 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. Level 1: (0 – 6 Marks) These answers will include two of the four advantages/disadvantages asked for in 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 and errors of grammar and spelling. Recommended annotation Intro for Introduction. A1 and A2 for advantages of such projects for local people. D1 and D2 for disadvantages of such projects for local people. DevA. and DevD. for development of advantages and disadvantages. eg for examples. Conc. for conclusion.

Qu	estion	Answer	Marks	Guidance
				Levels of response
4		 This question involves: candidates selecting two ideas from the list in terms of their appropriateness for reducing waiting lists justification of the choice of the first idea as the most appropriate to reduce waiting lists justification of the second choice as the least appropriate to reduce waiting lists. 		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.
		Indicative content		Level 5: (25 – 30 Marks) These answers will include a choice of two items from the list with a very good justification
		Pro financial incentive long term income for the young. Cash payments to donor card holders each year Con danger to the poor and needy expensive over longer term.		for both of them (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.
		Payment of funeral expenses for donors		Level 4: (19 – 24 Marks) These answers will include a
		Pro useful form of insurance insura		choice of two items from the list with a good justification for both of them (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.
		Jumping the NHS queue for those carrying a donor card		Level 3: (13 – 18 Marks) These answers will include a
		Pro		choice of two items from the list with an adequate justification for both of them (AO1 and AO2). Answers will include some material linked to AO3 eg examples, personal experience or discussion of definitions. In terms of AO4 (communication),
		Advertising for organ donors in less developed countries		these answers will be clear but contain errors of spelling, punctuation and grammar. The structure will be modest.
		Pro large population rewards attractive. Con supervision and exploitation motives and administration.		Level 2: (7 – 12 Marks) These answers will include a choice of two items from the list with a limited justification for both of them (AO1 and AO2). Answers will include limited material

Question	Answer	Marks	Guidance
			Levels of response
	Compulsory donation on death Pro		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. Level 1: (0 – 6 Marks) These answers will include a choice of two items from the list with a very limited justification for both of them (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 and errors of grammar and spelling.
	Pro may reduce need for donors aids cures for other illnesses. Con dangers of designer babies fear of the unknown.		Recommended annotation Intro. for introduction. M for item chosen as being most appropriate to reduce waiting list. L for item chosen as being least appropriate to reduce waiting lists. M1, M2,for justifications of the most appropriate item. L1, L2,for justifications of the least appropriate item. eg for examples. Conc. for conclusion.

Question	Answer	Marks	Guidance
5	This question involves:	30	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. Level 5: (25 – 30 Marks) These answers will include an issue of the candidates own choice together with one from the list provided. They will present a very good case for their choice having priority over the one selected from the list (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. Level 4: (19 – 24 Marks) These answers will include an issue of the candidates own choice together with one from the list provided. They will present a good case for their choice having priority over the one selected from the list (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 include an issue of the candidates own choice together with one from the list provided. They will present an adequate case for their choice having priority over the one selected from the list (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.

Question	Answer	Marks	Guidance
	 would need further education of people at a greater cost maybe just part of the natural process of weather patterns. Increased life expectancy food supplies and resources are being maintained due to new developments fewer people coming through in developed nations not a major factor for most companies. 		Level 2: (7 – 12 Marks) These answers will include an uncertain issue of the candidates own choice together with one from the list provided. They will present a limited case for their choice having priority over the one selected from the list (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. Level 1: (0 – 6 Marks) These answers will include an uncertain issue of the candidates own choice together with one from the list provided. They will present a very limited case for their choice having priority over the one selected from the list (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 and errors of grammar and spelling. Recommended annotation P for threat chosen personally. L for threat from list. A1, A2 for points of argument of priority of one over the other. Conc. for conclusion.

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	•	select, use and integrate a very good range of relevant knowledge	
	•	show a good understanding of the concepts involved	
AO2	•	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	•	demonstrate very good awareness of the differences between types of knowledge	25–30
	•	have a very good appreciation of the strengths and limitations of the different types of knowledge	
AO4	•	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	select, use and integrate a good range of relevant knowledge	
	show an understanding of the concepts involved	
AO2	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	demonstrate good awareness of the differences between types of knowledge	19–24
	have a good appreciation of the strengths and limitations of the different types of knowledge	
AO4	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	•	select, use and integrate a range of relevant knowledge	
	•	show an adequate understanding of the concepts involved	
AO2	•	undertake some interpretation and analysis of issues and problems and make a superficial evaluation	
	•	use evidence to develop arguments and draw conclusions	13–18
AO3	•	demonstrate awareness of the differences between types of knowledge	13-16
	•	have an appreciation of the strengths and limitations of the different types of knowledge	
AO4	•	communicate clearly, using some specialist vocabulary with facility	
	•	use some of the rules of grammar, punctuation and spelling with facility.	

Level 2

AO1	•	select, use and integrate a limited range of relevant knowledge	
	•	show a modest understanding of the concepts involved	
AO2	•	demonstrate limited interpretation and analysis of issues and problems with limited evaluation	
	•	use evidence to develop limited arguments and draw limited conclusions	7–12
AO3	•	demonstrate limited awareness of the differences between types of knowledge	7-12
	•	have a restricted appreciation of the strengths and limitations of the different types of knowledge	
AO4	•	communicate ideas with limited clarity, using some specialist vocabulary	
	•	use some rules of grammar, punctuation and spelling.	

Level 1

AO1	select, use and integrate some knowledge which may not be accurate	
	show a restricted understanding of the concepts involved	
AO2	demonstrate poor interpretation and analysis of issues, problems and evaluation	
	recognise arguments and conclusions	0.6
AO3	demonstrate very limited awareness of the differences between types of knowledge	0–6
	have a very restricted appreciation of the strengths and limitations of the different types of knowledge	
AO4	communicate with little clarity using occasional specialist terms	
	use poor grammar and punctuation, and inaccurate spelling.	

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

For staff training purposes and as part of our quality assurance programme your call may be recorded or monitored

Oxford Cambridge and RSA Examinations is a Company Limited by Guarantee Registered in England Registered Office; 1 Hills Road, Cambridge, CB1 2EU Registered Company Number: 3484466 **OCR** is an exempt Charity

OCR (Oxford Cambridge and RSA Examinations) Head office

Telephone: 01223 552552 Facsimile: 01223 552553



