



Rewarding Learning

**ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2011**

Geography

Assessment Unit AS 1

assessing

Physical Geography

[AG111]

TUESDAY 14 JUNE, AFTERNOON

MARK SCHEME

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Foreword

Introduction

Mark Schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of 16 and 18-year-old students in schools and colleges. The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes therefore are regarded as a part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

The Council hopes that the mark schemes will be viewed and used in a constructive way as a further support to the teaching and learning processes.

Introductory Remarks

The assessment objectives (AOs) for this specification are listed below. Students must

- AO1 demonstrate knowledge and understanding of the content, concepts and processes
- AO2 analyse, interpret and evaluate geographical information, issues and viewpoints and apply understanding in unfamiliar contexts;
- AO3 select and use a variety of methods, skills and techniques (including the use of new technologies) to investigate questions and issues, reach conclusions and communicate findings.

General Instructions for Markers

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all markers are following exactly the same instructions and making the same judgements so far as this is possible. Markers must apply the mark scheme in a consistent manner and to the standard agreed at the standardising meeting.

It is important to recognise that in some cases there may be other correct responses that are equally acceptable to those included in this mark scheme. There may be instances where certain judgements have to be left to the experience of the examiner, for example, where there is no absolute, correct answer.

Markers are advised that there is no correlation between length and quality of response. Candidates may provide a very concise answer that fully addresses the requirements of the question and is therefore worthy of full or almost full marks. Alternatively, a candidate may provide a very long answer which also addresses the requirements of the question and is equally worthy of full or almost full marks. It is important, therefore, not to be influenced by the length of the candidate's response but rather by the extent to which the requirements of the mark scheme have been met.

Some candidates may present answers in writing that is difficult to read. Markers should take time to establish what points are being expressed before deciding on a mark allocation. However, candidates should present answers which are legible and markers should not spend a disproportionate amount of time trying to decipher writing that is illegible.

Levels of Response

For questions with an allocation of six or more marks three levels of response will be provided to help guide the marking process. General descriptions of the criteria governing levels of response marks schemes are set out on the next page. When deciding about the level of a response, a "best fit" approach should be taken. It will not be necessary for a response to meet the requirements of all the criteria within any given level for that level to be awarded. For example, a Level 3 response does not require all of the possible knowledge and understanding which might be realistically expected from an AS or AL candidate to be present in the answer.

Having decided what the level is, it is then important that a mark from within the range for that level, which accurately reflects the value of the candidate's answer, is awarded.

General Descriptions for Marking Criteria

Knowledge and Understanding	Skills	Quality of Written Communication	
<p>The candidate will show a wide-ranging and accurate knowledge and a clear understanding of the concepts/ideas relevant to the question. All or most of the knowledge and understanding that can be expected is given.</p>	<p>The candidate will display a high level of ability through insightful analysis and interpretation of the resource material with little or no gaps, errors or misapprehensions. All that is significant is extracted from the resource material.</p>	<p>The candidate will express complex subject matter using an appropriate form and style of writing. Material included in the answers will be relevant and clearly organised. It will involve the use of specialist vocabulary and be written legibly and with few, if any, errors in spelling, punctuation and grammar.</p>	3
<p>The candidate will display an accurate to good knowledge and understanding of many of the relevant concepts/ideas. Much of the body of knowledge that can be expected is given.</p>	<p>The candidate will display evidence of the ability to analyse and interpret the resource material but gaps, errors or misapprehensions may be in evidence.</p>	<p>The candidate will express ideas using an appropriate form and style of writing. Material included will be relevant and organised but arguments may stray from the main point. Some specialist terms will be used and there may be occasional errors in spelling, punctuation and grammar. Legibility is satisfactory.</p>	2
<p>The candidate will display some accurate knowledge and understanding but alongside errors and significant gaps. The relevance of the information to the question may be tenuous.</p>	<p>The candidate will be able to show only limited ability to analyse and interpret the resource material and gaps, errors or misapprehensions may be clearly evidenced.</p>	<p>The candidate will have a form and style of writing which is not fluent. Only relatively simple ideas can be dealt with competently. Material included may have dubious relevance. There will be noticeable errors in spelling, punctuation and grammar. Writing may be illegible in places.</p>	1

Section A

1 (a) Targets

- **Formulation of Aim/Hypothesis** – The aim outlines the precise purpose of the investigation and provides a focus for the study. The aim may be sub-divided into discrete hypotheses to direct the course of the investigation and allow for manageable data collection and scientific empirical testing. The candidate needs to discuss **how** the aim/hypothesis was formulated as part of fieldwork planning.
- **Sampling Design** – Candidates may discuss sampling method or sampling size. Sampling is essential when it is impossible or impractical to study the total population. The consideration of both method and size of sample is essential to ensure that a representative portion of the population is selected (to avoid bias and increase the accuracy and reliability of the data collected). Candidates need to discuss **how** sampling design was planned/ conducted within the fieldwork.
- **Risk Identification and Management** – Candidates need to display an awareness of the importance of a health and safety conscious approach to fieldwork. Risk management is vital to minimise, or indeed eliminate, potential hazards during fieldwork. Candidates need to discuss how risks were identified and management strategies were planned as part of their fieldwork.
- **Pilot Testing** – Candidates need to recognise that pilot testing is important to ensure that accurate and reliable data is collected. A pre-fieldwork trial is essential so that problems can be identified and modifications can be incorporated into the methodology. Candidates must outline **how** pilot testing was conducted as part of their fieldwork planning.
- **Selection of suitable geographical location** – The selection of a suitable study site is essential if the aim of the study is to be explored reliably or meaningfully. Candidates need to discuss how site selection was completed within the planning phase of the investigation. This may have been completed through site visits, research of secondary sources, discussion, mapwork, prior teacher knowledge etc.

Candidates may use the structure provided to answer the question but obviously the allocation or weighting of marks for each component may differ according to the targets selected. Therefore the levels outlined below should allow for the flexibility required for candidates to reach their full potential.

For each selected target

Award ([3]–[4]) if the candidate displays a sound awareness of the **importance** of their selected target, as well as a description of **how** it was completed. Answers should be well written and encompass both aspects of the question.

Award ([1]–[2]) if the answer addresses both aspects of the question but with limited depth. Alternatively the answer may address only one aspect of the question. $2 \times [4]$ [8]

(b) The method selected must relate to **primary** data collection and must be evident on the table submitted.

Award ([3]–[4]) for a detailed description of the methodology with explicit and convincing reference to fieldwork.

Award ([1]–[2]) if the methodology described lacks detail, is incomplete or reference to fieldwork is less convincing. [4]

(c) (i) The mark breakdown is as follows:–

Title [1] – must be accurate and specific to the variables plotted

Conventions [2] – for labelled axes
– for provision of a key (if necessary)
– for appropriate scaling of the graph
– for correct axes (dependent and independent variables)

Accuracy [3] – for the accurate and precise plotting of values from the table

Method [1] – for the selection of an appropriate graphical technique (in relation to the aim and data tabulated)

N.B. Line graphs require continuous data on the x-axis

T – 1
C – 2
A – 3
M – 1

[7]

(ii) **Description**

Award ([2]) for accurate graph description with quotation of values

Award ([1]) for a more general analysis with quotation of values omitted

Explanation

Award ([5]–[6]) for thorough geographical reasoning which incorporates relevant theoretical concepts and includes specialist terminology.

Award ([3]–[4]) for valid reasoning which lacks explanatory depth. Some attempt is made to incorporate relevant aspects of geographical theory.

Award ([1]–[2]) for simplistic reasoning with very limited/no attempt to integrate theory or specialist terms.

Award maximum [4] if graph is missing or incomplete.

[2] + [6] = [8]

(d) Evaluation is an essential stage in the investigation process as it involves a critical reflection of the fieldwork (methods, results or conclusions). Look for an awareness of strengths, limiting factors, potential improvements, modifications etc.

Award ([3]) if the candidate demonstrates a clear awareness of the purpose of evaluation with explicit and convincing reference to the individual fieldwork.

Award ([1] or [2]) if the candidate displays a more limited understanding of the purpose of evaluation. There may be little/no meaningful reference to fieldwork.

[3]

30

Section A

30

Section B

- 2 (a) (i) The rivers that discharge the highest amounts of suspended sediment are found between the Equator and approximately 40°N. Some students may write about the effect of different rock types on erosion rates and therefore sediment loads. Others may explain climatic factors, human factors (such as deforestation) or rates of weathering. This is fine and should be marked on merit. [4]
- (ii) Candidates are required to describe a method other than suspension so those who use this method will gain no marks. Candidates can choose any other river transportation method – saltation, solution, traction. They need to describe their chosen method, not merely identify it. [2]
- (b) There are a number of land uses that students could use to answer this question but most will probably answer by comparing urban and agricultural. They should have two clear land uses and have described how each can affect the shape of a storm hydrograph using good terminology (lag time, peak discharge etc). They must have offered valid reasons to account for the differences they described e.g. the effect of the differing amounts of vegetation cover, the different types of ground cover etc.

Level 3 ([5]–[6])

A good answer that has fully addressed all aspects of the question. They have two clear contrasting land uses and, using good terminology, have described their different hydrographs and offered valid reasons to account for such differences.

Level 2 ([3]–[4])

Still a good answer but the depth of knowledge may be less than above and terminology weaker. The description may also be stronger than the explanation in this level.

Level 1 ([1]–[2])

A weak answer that lacks details related to the question. An answer that may have some inaccuracies may also be limited to this level. [6]

12

- 3 (a) (i) Biomass [1]
- (ii) Decomposition, any valid expression relating to decay pathway [1]
- (iii) Candidates can discuss any valid factor that may affect a named nutrient transfer [1] – e.g. climate (temperature or precipitation) and amount of vegetation. They must show a clear understanding as to how their chosen factor affects the amounts of nutrients transferred. [1] [2]
- (b) (i) [1] Accuracy of diagram
 [2] Labels and/or key appropriate to small-scale case study
 [1] + [2] = [3]

- (ii) Candidates will base an answer around – energy enters the ecosystem in the form of sunlight from the sun. This will be used by the primary producers through photosynthesis to produce energy available for the herbivores. Some energy will be lost at each stage through heat loss, respiration, excretion, decomposition, cell processes etc. At the next stage a carnivore consumes a herbivore. As 90% of energy is lost at each trophic level, fewer species can thus exist. [5]

Max. [4] if no appropriate case study

Level 3 ([5])

Candidate presents a thorough, accurate and well written explanation of energy flow and subsequent loss from each Trophic level in a **named** small scale ecosystem. Key terminology is used appropriately.

Level 2 ([3]–[4])

Answer displays a good understanding of energy flow but depth of knowledge may be less than above and fewer specialist terms may be used. There may be less explicit reference to selected small scale study.

Level 1 ([1]–[2])

Candidate presents a more simplistic answer with some understanding but lacking in depth. Gaps in knowledge may be evident as well as some inaccuracies. There may be no relevant case study references.

12

- 4 (a) (i) Between 40 degrees North and 40 degrees South there is a region of heat surplus, where mean annual input exceeds mean annual output. Outside these latitudes there is a region of heat deficit; mean annual input is less than mean annual output. [3]

- (ii) Most candidates will explain ocean currents as a horizontal heat transfer. They should be able to describe ocean currents moving from the equator to the polar areas and back again carrying warm water from the equator northwards. For full marks students will name an example, e.g. the Gulf Stream. [3] for explaining their chosen method. Acceptable horizontal heat transfers include global wind systems, jet streams, hurricanes. [3]

- (b) Factors include: over warm seas with a surface temperature of at least 27 degrees Celsius; in the tropics, but not within 5 degrees of the equator; between July and November in the northern hemisphere and between January and March in the southern hemisphere. Candidates need to explain two factors. Candidates who merely describe a factor will be limited to [2]. $2 \times [3] [6]$

12

Section B

36

Section C

- 5 Candidates should show an understanding of an open system. They should know that this involves the transfer of energy and material into and out of the system. They should be able to specifically discuss by name the inputs, outputs, stores and transfers of water and sediment in the drainage basin system.

INPUTS: (energy), precipitation, sediment

OUTPUTS: (energy), evapotranspiration, discharge to the sea, sediment discharge

STORES: vegetation, soil, ground water

TRANSFERS: stem flow, throughfall, infiltration, percolation, overland flow, throughflow, groundwater flow and sediment transport etc.

Candidates who simply describe the inputs, outputs, stores and transfers of one component within a drainage basin open system with no reference to the other (water/sediment) should be limited to level 2. There is no requirement for a balance between water and sediment components.

Level 3 ([9]–[12])

A good answer that clearly understands the concept of an open system and has related this to the drainage basin system with specific inputs, outputs, stores and transfers of water and sediment being named. Geographical terminology is of a high standard.

Level 2 ([5]–[8])

Still a good answer but the depth may be less than above. The range of stores and transfers discussed maybe less. Candidates who focus only on one component will also be limited to this level.

Level 1 ([1]–[4])

A weak answer with some inaccuracies and poor geographical terminology in relation to drainage basin and open systems will fall into this level.

[12]

12

- 6 There are two strands to this question: firstly describe the negative impact of human activity in a mid-latitude grassland region and, secondly, explain the attempts to manage this area. Both need to be addressed but a balance is not needed. In relation to human activity candidates may mostly discuss monoculture and its impacts. They may discuss the idea that monoculture is the practice of growing the same crop in the same field year after year. In the case of the mid latitudes these crops are cereals. Monoculture removes the same nutrients from the soil year after year so that fertility gradually decreases and crop yields are gradually reduced. Monoculture causes the deterioration of the soil structure. This leaves the soil prone to more erosion by both wind and rain. Many may then go on to discuss the Dust Bowl. Other activities with negative impacts may include overgrazing, mechanisation, industrial farming techniques etc. Good management techniques might include returning areas to their natural state or introducing farming practices which improve soil structure or moisture content and increase soil nutrients. These might include crop rotation, planting of shelter belts, wheat stubble, mulching, terracing or contour ploughing etc. Candidates should be able to **explain** how the management techniques work and there should be clear reference to case study material.

Level 3 ([9]–[12])

The candidate uses relevant case study material and clearly describes the negative impacts of human activity on their chosen area. They also explain how a range of management techniques have been used in an attempt to manage this ecosystem.

Level 2 ([5]–[8])

The candidate produces a less detailed answer, where reference to case study material is less effective or where depth of knowledge is limited. Management techniques may be limited or less well explained.

Level 1 ([1]–[4])

The candidate produces an answer which is generalised or inaccurate with little or no case study material. The quality of communication may also be poor.

[12]

12

7 An anticyclone is a large mass of subsiding air. The source of this air is in the upper atmosphere where there is little water vapour so the air is dry. As the air is descending it is warming adiabatically and therefore condensation does not occur. Cloud formation is suppressed and anticyclones are associated with clear skies and sunny weather. In summer time, since the daylight hours are long there is more incoming radiation than outgoing radiation during the shorter night time hours and temperatures are high.

Summer anticyclones can produce heat wave conditions leading to drought. This would have effects on crop yields and therefore on some food prices. There might be water rationing/hosepipe bans. The weather conditions would increase local tourism and sales of products such as ice cream but also cases of sun burn.

In winter temperatures can be very low and fog may develop. There may be traffic problems resulting from black ice on the roads, asthma attacks due to the formation of photochemical smog in urban areas, more hospital admissions from accidents due to people falling on ice, cancellation of sporting fixtures, disruption of travel etc.

Level 3 ([9]–[12])

The candidate produces a good answer that explains the weather associated with a summer anticyclone and using sound case study material has contrasted the impacts of winter and summer anticyclones on people.

Level 2 ([5]–[8])

A less detailed answer with some inaccuracies. Candidates who lack good case study depth will be limited to this level. Candidates may describe rather than explain summer anticyclone weather, or may omit one season's impacts.

Level 1 ([1]–[4])

The candidates' knowledge and understanding are both very limited. The answer may be missing one aspect of the question entirely. [12]

Section C

Total

12

24

90