



Rewarding Learning

**ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2018**

Geography

Assessment Unit AS 1

assessing

Physical Geography

[SGG11]

TUESDAY 15 MAY, AFTERNOON

**MARK
SCHEME**

MARK SCHEMES

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- to 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 mark 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	Level
<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

AVAILABLE
MARKS

- 1 (a) (i) This delta was formed at the mouth of the Fitzsimmons Creek river and could be described as “arcuate” in shape as it is comprised of multiple distributary channels with its outer edges shaped like an arc of a circle. The landform has progressively grown outwards in a north-western direction into Green Lake. Although the rate of growth varies, it has extended approximately 220m since 1947.

Marks are awarded for a **description** of delta growth.

Award [3] for a detailed description of delta growth. Relevant evidence is extracted from **Resource 1B**.

Award [1]–[2] for a less detailed **description** of delta expansion. Resource evidence may be more limited and the quotation of relevant values may be omitted. [3]

- (ii) There are particular **processes** which encourage delta formation. This delta has formed at the mouth of the high energy Fitzsimmons Creek river which **transports** a high annual sediment volume of 20 000 Mg/year. Sediment yield is obviously maximised by the partial vegetation cover of the drainage basin and the discharge level of the river in flood conditions. As river velocity decreases on entering Green Lake (a standing body of water) the reduced competence and capacity of the river results in **deposition**. The foreset beds, composed of medium calibre sediment are deposited on top as a steep angled wedge. The topsets beds consist of horizontal layers which settle on top and are comprised of coarse calibre sediment. The process of **braiding** results in the formation of multiple distributary channels. Deltas form where the rate of sediment deposition exceeds the rate of removal and obviously the lack of wave action in Green Lake reduces sediment removal allowing this delta to expand over time. Furthermore, vegetation **colonisation**, as evident in the image (**Resource 1B**) facilitates the stabilisation of sediment through the process of **bioconstruction**.

Level 3 ([5]–[6])

A comprehensive response demonstrating detailed knowledge and understanding of delta building processes with the effective integration of the contextual spatial resource material. Specialist terminology is employed with accuracy. The level of written communication is excellent.

Level 2 ([3]–[4])

An answer which displays a reasonably broad knowledge of delta formation. There may be some obvious omissions in content and/or key terminology. For [4] marks some attempt has been made to relate the spatial resource materials into the explanatory answer. The level of written communication is good.

Level 1 ([1]–[2])

A more simplistic response, displaying a more basic grasp of the delta formation processes. There may be little or no relevant resource material included and an obvious lack of specialist terminology. The level of written communication may be basic.

Maximum of [3] marks for an answer which provides an accurate and

detailed account of the delta formation processes with no appropriate reference to the Resources. [6]

- (b) (i) Dredging involves the excavation of deposited silt from the bed of a channel, often achieved through the use of heavy industrial pumps or filters. Supporters of dredging argue that it reduces flooding as it enlarges the channel capacity, allowing a larger volume of water to flow more rapidly and efficiently through the drainage basin to the sea. It is evident that the temporary flood management materials placed by the residents on the river bank have proved to be ineffective to the rising river levels.

Award [2] for a coherent answer which displays a sound awareness of **both** how dredging is achieved and its purpose in river management.

Award [1] for an answer which accurately addresses one of the above aspects of the answer. [2]

- (ii) Sustainable river management involves an extension of our temporal and spatial parameters to consider the consequences of decisions for the future and for communities living further afield. “Soft” engineering techniques work with the local people and the environment to reduce flooding. They may be less expensive and thus more economically sustainable. Candidates may select a method such as floodplain zoning, afforestation, wetland restoration, flood warnings etc.

Mark Breakdown (2 x [2]):

Award up to [2] for an answer which identifies a sustainable river management technique with an understanding of **how** it works.

Award up to [2] for an awareness of how their chosen strategy provides sustainable and environmentally sensitive management. [4]

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- 2 (a) **Resource 2A** illustrates the Tropical Rainforest biome which is located in the Amazon Basin (South America), the Congo River Basin (Western Africa) and Indonesia (South East Asia). There is also smaller coverage in areas such as Central America.

The breakdown of marks is as follows:

Award [1] for the identification of the Tropical Rainforest biome.

Award up to [2] for a description of their distribution with accurate recognition of places. [3]

- (b) (i) Autotrophs, such as diatoms, eel grass etc, are the primary producers in the Silver Springs ecosystem. These organisms can harness solar energy and utilise water and carbon dioxide to photosynthesise and provide energy (glucose) for the heterotrophs, such as the turtles, snails, mullets etc.

Award [3] for a coherent, accurate explanation of the role of the autotrophs. The answer should include relevant theoretical content, key terminology and appropriate exemplification from **Resource 2B**.

Award [1]–[2] for an explanation which may be less complete, less

detailed or more simplistic. The answer may be theoretical with no exemplification from the ecosystem presented.

[3]

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(ii) There are two key elements in this question.

Mark Breakdown is as follows ([2] + [3]):

Description up to [2] for a recognition that the energy content decreases as the trophic level increases. The accurate quotation of relevant values is essential for full marks.

Explanation up to [3] for an awareness that energy transfer is not 100% efficient and thus the proportion declines at each progressive trophic level. Energy can be lost from the producers as a result of respiration or metabolic cell processes. Losses from the consumers include heat, waste, movement, digestion, reproduction etc. [5]

(c) A plagioclimax is the resultant plant community which develops when natural succession is altered by human activity, or sometimes natural sources, often affecting the species in the ecosystem. These activities may include burning, forest clearance, planting, grazing, trampling, harvesting etc

Mark Breakdown (2 x [2]):

Award up to [2] for an articulate definition of a plagioclimax.

Award up to [2] for a logical explanation of one deflection factor, human or physical, which may produce such a vegetation community.

An illustrative example is not essential for full marks.

[4]

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3 (a) **Resource 3A** spans a huge distance from Indonesia in the western Pacific eastwards to the western coast of South America.

During “normal” conditions, the pool of warmest water generally lies in the western Pacific. The force of the Easterly Trade Winds actually keeps the warm water in place. This warmer water heats the air above which rises, creating low pressure. This rising air cools and condenses at dew-point temperature to produce rain clouds over Indonesia.

The upwelling of the colder water from the deeper levels in the east Pacific, the “Humboldt Current”, produces colder temperatures, high pressure and dry conditions.

With the onset of El Niño, which can occur every 3–8 years, the trade winds weaken in the Central and Western Pacific due to the change in atmospheric pressure. Surface water temperatures off South America warm up, because there is less upwelling of cold water from below to cool the surface. The cloud and rainstorms associated with warm ocean waters shift towards the central and eastern Pacific, whereas Indonesia experiences subsiding air and drier than normal conditions.

Level 3 ([5]–[6])

A detailed answer which includes a clear description of the visual evidence presented in **Resource 3A**, as well as a logical, accurate and well developed explanation. Geographical terms are used with relevancy and proficiency.

Level 2 ([3]–[4])

An answer which includes some partially relevant description and explanation of global wind and rainfall patterns. At the lower mark boundary, there may be description only with limited resource evidence included. The level of written communication may be reasonable.

Level 1 ([1]–[2])

A more generic description and/or explanation. The answer may display a lack of structure with ideas communicated in brief, incomplete simplistic statements. The level of written communication may be more basic. [6]

(b) (i) Award [1] for the correct annotation on Resource 3B displaying the centre of the low pressure system. [1]

(ii) • A is an Occluded Front [1]
• B is a Tropical Maritime air mass [1] [2]

(iii) **Resource 3B** indicates that the cold front is moving across the West of Ireland with high levels of rainfall forecast (100mm) and strong winds (up to 120km/hr). As the cold, dense Polar Maritime air mass invades, the pressure rises sharply as it undercuts the lighter, less dense Tropical Maritime air mass, forcing it to rise rapidly. This pressure gradient results in strong winds. The rapid uplift of the warm Tropical Maritime air mass results in cooling and instability with an increase in relative humidity and condensation at dew point temperature. The release of latent heat and subsequent uplift results in the build-up of cumulonimbus clouds which release high levels of frontal rainfall. Winds approach from the north west as air is rapidly uplifted to the Polar Front Jet Stream in an anticlockwise motion around this low pressure centre.

Level 3 ([5]–[6])

A detailed, coherent answer which explains the projected wind **and** rainfall conditions. Communication is clear, ideas are well sequenced and a sound knowledge of meteorological processes and terminology is evident.

Level 2 ([3]–[4])

A less detailed answer which may provide some relevant explanation of both weather variables from **Resource 3B**. Alternatively the answer may focus on only one of the aspects of the forecast weather. The level of communication may be reasonable with a less confident inclusion of specialist terminology.

Level 1 ([1]–[2])

A more simplistic explanation with an obvious lack of depth and specialist terminology. The answer may lack resource reference and completeness. [6]

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Section B

AVAILABLE
MARKS

- 4 This question is clearly twofold, although a balance is not necessarily required. The precise causes of flooding explained will depend on the spatial context selected from a MEDC. Causes may primarily relate to climatic factors, although other topological, geological, edaphic, pedological or human factors may conspire and contribute to the flood event. Furthermore, candidates need to discuss the impact of their selected flood event on people. Such effects may relate to deaths, injuries, evacuation, damage to homes, travel disruption, unemployment, stress etc. A good answer should include case study and locational details.

Level 3 ([11]–[15])

A well structured answer which addresses both aspects of the question in an effective manner. Case study detail is impressive and a good range of flooding causes are explained. A range of human effects are detailed for the specified flood event. The level of written communication is excellent.

Level 2 ([6]–[10])

The causes of flooding are outlined for a specified MEDC flood event but the answer may lack the breadth or depth of knowledge expected for the higher level. There are some human effects outlined, although the content of the answer may be more theoretical with less case study detail included. The level of written communication is good.

Award up to a maximum of [8] marks for an answer which addresses only one aspect of the question.

Level 1 ([1]–[5])

Although the answer may have some good qualities, the candidate provides a more generalised, simplistic answer which lacks depth. There may be no spatial context and only one aspect of the question may be addressed simply. The quality of written communication may be basic.

Award [0] for a response which provides no valid or relevant content. [15]

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- 5 The regional scale Tundra case study selected will determine the actual detail provided in the answer. The answer requires evaluation and therefore a degree of critical appraisal or thoughtful judgement is an essential aspect of the response. The evaluation may include positive and/or negative impacts on the ecosystem. Candidates need to address both actual and potential impacts of climate change with a focus on the Tundra ecosystem. There are a multitude of acceptable and relevant impacts which may be evaluated. Candidates may consider how Climate Change results in permafrost thaw, with well documented consequences on the impact on the soils and vegetation of the ecosystem. Candidates may also consider the ecological impact of climate change on the biodiversity, the growing season, the tree line, natural succession etc. Habitat modification and change may necessitate a consideration of the impact on the wildlife, marine life and their migration patterns. Indigenous tribes who may live in harmony with their environment may also be seriously affected by projected climate change.

Level 3 ([11]–[15])

An appropriate regional scale Tundra ecosystem case study is selected and a detailed evaluation of a diverse range of actual and potential impacts is considered. Specialist terminology is competently employed and case study details are impressive. The level of written communication is excellent.

Level 2 ([6]–[10])

An appropriate case study is introduced but used less effectively for exemplification. A less detailed and/or more narrow range of impacts may be evaluated with a consideration of actual and/or potential consequences. The level of written communication is good, with some attempt to include specialist terminology.

Level 1 ([1]–[5])

Although the answer may have some good qualities, there may be little, or no, case study material included. The answer may be more theoretical with more limited evaluation of the impacts on the ecosystem. There may be some misunderstanding, or possible inaccuracies, evident at this level. The level of written communication may be basic.

Award [0] for a response which provides no valid or relevant content. [15]

- 6** There are many factors which influence insolation and the heating of the atmosphere. On a global scale, temperatures vary as a result of many interacting factors such as latitude (distance from the equator), altitude (height of the land above sea level), the maritime effect (distance from the sea), seasonality (the angle of incidence influencing solar energy received and day length) as well as the influence of ocean currents and global winds/air masses. On a more local scale factors such as aspect and shelter can have a modifying influence. The question also requires some spatial knowledge for exemplification purposes. Good answers should include comprehensive reasoning for each selected factor and include relevant meteorological processes and concepts.

Level 3 ([11]–[15])

A range of valid factors are identified and explicitly explained with relevant spatial exemplification. The answer displays a comprehensive understanding of meteorological processes and specialist terminology. The level of written communication is excellent.

Level 2 ([6]–[10])

Although there are many creditable qualities in the answer, it may lack the breadth or depth of the higher level. The spatial component of the answer may be neglected. Some specialist terms are used with relevancy and the level of written communication is good.

Level 1 ([1]–[5])

Some valid and creditworthy factors may be introduced with simplistic reasoning which may lack clarity and specialist terminology. The spatial requirement of the answer may be neglected and some inaccuracy may be evident at this level. The level of written communication may be basic. An explanation of one factor only.

Award [0] for an answer which provides no valid or relevant content. [15]

Section B**Total****AVAILABLE
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30**75**