



GEOGRAPHY

9768/01

Paper 1 Global Environments

May/June 2019

MARK SCHEME

Maximum Mark: 50

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Question	Answer	Marks
Section A Answer <u>one</u> question from this section		
Hot Arid and Semi-Arid Environments		
1(a)	Fig. 1 shows some of the landforms found in part of the southern Sahara Desert.	
1(a)(i)	Using Fig. 1 briefly describe one landform formed by wind and one landform formed by water. Wind action: linear and/or crescentic dunes or yardangs. Water action: wadis, Lake Chad and rivers. Diagrams are not essential given that they are illustrated on the map. A mark is allocated for each correct choice of landform and the second mark for a developed description of that landform. Reference to the map i.e. scale can also be credited.	4
1(a)(ii)	Explain how the landforms shown in Fig. 1 demonstrate that the area previously experienced a wetter climate. Reference is made to landforms created by wind and water. Both the amounts of sand and the scale of the water formed features suggest an area that underwent periods of higher rainfall in the past notably during the 'pluvials' associated with the Pleistocene when the climatic belts had been pushed further south. Explanations should examine the relationship between the scale of the landforms and the nature of the present day aridity which is unable to move such large quantities of sand or erode such deep canyons. Wadis are essentially dry valleys, the rivers flowing only and briefly during 'flash floods' in the present day.	6
1(b)(i)	To what extent is climate the controlling factor in the hydrological cycle and water balance found in hot arid and semi-arid environments? Indicative content: The hydrological cycle and water balance should be outlined, the input-output ratios and how the annual water surplus and deficit may change; e.g. the unlikelihood of a surplus in hot arid but a different outcome in semi-arid environments. The input is rainfall, and since this is in short supply, reference needs to be made to the annual amounts and form in which it falls. The relationship with the other factors that may control the hydrological cycle and water balance should be discussed, i.e. soils, climate change, vegetation, and human factors. Expect carefully and appropriately selected case studies to illustrate and emphasise the importance of the human role i.e. management strategies for top level answers.	15

Question	Answer	Marks
1(b)(ii)	<p>With reference to hot arid and semi-arid environments, to what extent is migration of people the main response to hot arid and semi-arid environments?</p> <p>Indicative content</p> <p>Both hot arid areas such as the Sahara and their tribes e.g. Tuareg and semi-arid areas and tribes such as the Fulani should be referred to and the difference in response between fully nomadic and semi-nomadic people. Recent management strategies should be discussed in order to show how such lifestyles are in the process of transition and change; due to greater technology, alternative developments like the growth of tourism and in response to climate change etc. Contrast could be provided by comparing the less developed and more developed parts of the world, e.g. The Sahara, Sahel and areas of the US. Candidates may use case studies to develop their opposing arguments. Answers which characterise the top level will use case studies effectively and keep migration at the forefront of the response.</p>	15

Question	Answer	Marks
Glacial and Periglacial Environments		
2(a)	Fig. 2.1 shows a group of tourists on the coast of part of Antarctica	
2(a)(i)	<p>Describe the landscape and the seascape shown in Fig.2.1</p> <p>Bare rock, no vegetation, rocky foreshore with strewn ice-smooth boulders, snow lying (PSL) at sea level look as if it might be melting, knife edged ridges, a pyramidal peak. Specific named landforms with no development and description will not gain credit.</p>	4
2(a)(ii)	<p>With reference to Fig.2.1 explain why these tourists represent a threat to the environment.</p> <p>Penguins: noise and movement disturbing the penguin colony. The colony is composed of baby penguins which may be more sensitive to the intrusion. Litter: litter left behind which might pollute the water in this fragile environment. Penguins might try to eat the litter which could make them ill or kill. Tourists: problems of lack of toilet / all facilities for the tourists which might pollute the area. Tourist vessels causing oil pollution of the water offshore. Intrusion causing migration patterns of the colony to change.</p> <p>At least two threats should be mentioned and fully explained.</p> <p>Threats which may occur by inference, e.g. introduction of native species, viruses etc., cruise ships which may cause pollution are acceptable provided there is a direct causal relationship made to the natural environment shown in the photograph.</p>	6
2(b)(i)	<p>Discuss the extent to which glacier movement is the result of basal sliding.</p> <p>Indicative Content:</p> <p>The ways in which glaciers move and how and why they move. Basal sliding, bed deformation and internal flow/plastic deformation should be considered and illustrated. Speeds may be mentioned. Mass balance in relation to movement v. stagnation. There should be reference to cold and warm based glaciers for full understanding of the processes as without some melting between the base of the ice and the rock there would be no basal sliding which tends to be found in warm-based glaciers. Some candidates may be familiar with the latest research which demonstrates the importance of the sub glacial material and its deformation which aids movement. Glacial quakes may also be referred to.</p> <p>A definitive conclusion should emerge that is based upon the evidence presented.</p>	15

Question	Answer	Marks
2(b)(ii)	<p>Discuss the extent to which you consider glacially deposited landforms easier to identify than fluvioglacially deposited landforms.</p> <p>Indicative content:</p> <p>The processes of deposition by two different agents should be outlined. The landforms produced made clear and then the ways in which they may be distinguished. Glacial landforms deposited by ice: moraines, drumlins, erratics etc. Distinguished by: till/angular clays, unbedded, unsorted showing no stratification. Fluvioglacial landforms deposited by glacial meltwater: eskers, kames, kame terraces, outwash plains etc. Distinguished by: stratified, bedded, sorted and rounded materials.</p> <p>Scale of landforms could be a key method of comparing the ease of their identification in the field.</p> <p>There should be a definitive conclusion based on the evidence provided by the argument parameters discussed.</p>	15

Question	Answer	Marks
Coastal Environment		
3	Fig. 3.1 shows a profile of a typical sand dune ecosystem in the U.K	
3(a)(i)	<p>With reference to Fig. 2, describe the form of the sand dunes Relative heights and lows of the dunes and the dune slacks. Summarise and use the data given contrasting heights with the depths with some overall analysis. Vegetation is not required.</p>	4
3(a)(ii)	<p>Explain the changes in vegetation across the sand dune ecosystem shown in Fig. 3.1</p> <p>The plant succession should be described and explained in terms of species, numbers and height. Explanations may also include increasing soil depth and nutrient content as well as acidity and water content.</p>	6
3(b)(i)	<p>To what extent are concordant and discordant coastlines the result of marine processes?</p> <p>Indicative content:</p> <p>Good knowledge of both coastlines is needed and of marine processes and geology as a controlling factors. Examples should be used and clearly drawn well-labelled diagrams included. Better responses will appreciate the range of controlling factors citing wave type, approach of the wave front and wave refraction as crucial factors along such coastlines because of their configuration. Specific landforms along these coastlines, e.g. caves, arches, stacks, bays, coves and headlands should also be included.</p>	15
3(b)(ii)	<p>Examine the extent to which it is possible to manage coastlines sustainably.</p> <p>Indicative Content:</p> <p>A clear understanding of the meaning of sustainable. Ways to manage coastlines, hard and soft engineering ideas of coastal protection as well as human and economic uses. A discussion of stakeholders, gatekeepers, interest groups, pros and cons should be given to produce a balanced argument. Case study material using a stretch of coastline should be used to exemplify and reinforce the argument being developed.</p> <p>Responses which characterise the top level will be comprehensive and wide ranging forming a well-balanced argument with a well-justified equivocal conclusion underpinned by factual content.</p>	15

Question	Answer	Marks
Section B Answer <u>one</u> question from this section		
Tropical Environments		
4	Photograph Fig. 4.1 shows an area of forest in the Udzungwa Mountains National Park in Tanzania, East Africa. Figs 4.2 and 4.3 shows some of the ways in which the area is being used by human activity.	
4(a)(i)	Describe the characteristics of the vegetation shown in Photograph Fig. 4.1. Complete canopy, all the leaves at the top of the trunk, wide crown and some narrower crowns, dense, all trees, branching of the trunk at the top.	4
4(a)(ii)	Explain the ways in which some of the human activities shown in Figs 4.2 and 4.3 are sustainable. Managed exploitation of the forest resources, i.e. the wood for fuel cooking, housing etc. no transport so the wood is carried on the head. Small scale harvesting only as much as can be carried by one woman at a time.	6
4(b)(i)	‘Soils and vegetation are closely linked in a tropical environment’. How far do you agree with this statement? Indicative content: Knowledge of the tropical environment ecosystem is demonstrated. One approach would be via the nutrient cycle and use of a diagram. The nutrients are held in the vegetation; soil is so heavily leached that it is not nutrient rich but the depth supports the trees. Candidates may argue that so little of the tropics is now undisturbed by human activity, that the human factor in fact breaks the indissoluble link. Thus soils have paled into relative insignificance if indeed they were ever hugely important in maintaining the vegetation without the input of perennial leaf fall and the perennially humid climate. Most responses will use tropical rainforests, but responses which characterise the top level may also use the savanna environment to show different soils and different balances between soil and vegetation.	15

Question	Answer	Marks
4(b)(ii)	<p>The rich biodiversity found in Tropical rain forest ecosystems is largely due to the climate'. Discuss the validity of this statement.</p> <p>Indicative content:</p> <p>Climate: solar energy, rainfall, no seasonality, high, equable temperatures, light levels within the forest, growing season etc.</p> <p>Time; adaptation; ecological niches; pressure from pests parasites, disease, soils, nutrient cycling; productivity; specialisation, altitude, aspect, and human activities. etc. These are all factors which might be discussed.</p> <p>Responses which characterise the top level may also include ecological and biodiversity theories and provide detailed reference to climate together with statistical data alongside a range but not necessarily comprehensive coverage of other factors.</p>	15

Question	Answer	Marks
Temperate environments		
5	Photograph 5.1 and Photograph Fig.5.2 show areas of temperate deciduous forest.	
5(a)(i)	<p>Describe the structure of the temperate deciduous forest shown in Photograph Fig 5.1.</p> <p>Layered- three/four distinct layers. Deciduous trees are the dominants, open, quite spread out branching at lower levels. Shrub layer, not very dense, less than half the height of the trees, wide leaved species. Herb Layer – grasses almost 100% coverage. Ivy clambering up tree trunks from the herb layer and then a ground layer of litter. Responses may only include three layers which is acceptable.</p>	4
5(a)(ii)	<p>Using Fig. 5.2 explain how the area is being managed for ecological and economic sustainability.</p> <p>Coppicing has taken place. The trees are thinned out on an individual basis allowing more light to penetrate. It avoids the need for re-planting because judicious removal of some of the branches allows regeneration because the root system is well developed and the strategy provides wood for crafts, local jobs and well as maintaining the diversity of the woodland. The trees typically coppiced are hazel ash birch willow alder hawthorn etc. The economic aspects in terms of uses of the coppiced wood need to be included.</p>	6
5(b)(i)	<p>To what extent is climate the controlling factor in the global distribution of temperate environments?</p> <p>Indicative content:</p> <p>The global distribution should be outlined including the latitudinal limits, a simple map to show the distribution could be included. TDF, taiga, prairies and steppes, heathland and moorland environments should all be mentioned. As this is a wide-ranging question responses may focus on selected temperate environments once the overall picture is outlined. The overriding factor may be climate but given the exploitation of these areas, an acceptable alternative view may be that climate is no longer the controlling factor. Nuanced arguments may suggest that the controlling factor(s) and the balance vary from place to place. A knowledge of all the factors soils relief, geology, altitude and human and fauna may be outlined and used to illustrate differences in scale, i.e. global, regional and local. The latter indicates responses which characterise the top level. Better responses will also include an awareness of scale.</p>	15

Question	Answer	Marks
5(b)(ii)	<p>Discuss the extent to which the variation in zonal soils found in temperate environments are closely associated with variations in temperate vegetation.</p> <p>Indicative content: Soil and vegetation are closely linked with a functioning ecosystem. There are a range of other factors which are also important and play a part; climate, climate change, disease, natural disturbance theory fire etc. as well as human factors, fauna and geology. Zonal soils form the factual content: brown earths, podzols and chernozems. They are associated with different temperate ecosystems so this link should be made.</p> <p>Responses which characterise the top level will be familiar with all the zonal soils and discuss the close link between zonal soil and its vegetation with other factors comprehensively considered and well exemplified giving a clearly stated conclusion.</p>	15

Question	Answer	Marks
The Atmospheric Environment		
6	Fig. 6.1 shows the relationship average monthly insolation for four different cities at different latitude.	
6(a)(i)	<p>Briefly describe the differences in average monthly insolation for Mexico City and Shanghai shown in Fig. 6.1</p> <p>Highest levels are Mexico City over 4 kWh all the year. Compare with Shanghai which is lower consistently apart from a peak above Mexico City in July. Shanghai has a much greater annual variation. Accurate figures must be given for maximum marks. Relative temperatures and range are the two essential elements in the question.</p>	4
6(a)(ii)	<p>Explain why average monthly insolation is different between Singapore and London.</p> <p>Reasons proximity to the Equator. Position of the sun nearly always directly overhead in Singapore. Two maxima because of the limited seasonal migration of the ITCZ. London – two solstices and two equinoxes. The angle of the sun and the distance travelled through the atmosphere are the two key points needed to explain the differences.</p>	6
6(b)(i)	<p>For a named air mass, discuss the extent to which it influences the cool temperate western maritime climate.</p> <p>Indicative content:</p> <p>Responses should focus on the mid latitude climate typical of the UK and understand that it is about anticyclones or depressions and whether these influence the cool temperate western maritime climate. Responses will vary in approach depending on which air mass is selected by the candidate.</p> <p>Depressions: these latitudes lie in the air streams which come across the Atlantic and tend to be influenced by the polar front which is the boundary zone between polar maritime air and tropical maritime air producing fronts which bring changeable wet weather. Anticyclones: a single air mass usually the tropical continental or polar continental air masses bring stable dry weather which is a function of the time of year and particular air mass. Less frequent although they can remain stationary for up to weeks.</p> <p>Responses which characterise the top level may also emphasise the seasonal nature of these single air masses or the way in which they interact with another air mass to produce characteristic systems and that they are not the principal influence on our climate.</p>	15

Question	Answer	Marks
6(b)(ii)	<p>‘The impact of both seasonal changes and the unreliable nature of monsoon rains require both long and short term management.’ Assess the validity of this statement.</p> <p>Indicative content:</p> <p>Answers should define and locate monsoon environments and better responses will outline some of the spatial variations as tropical monsoon climates and environments are found in varying states across Asia. A range of management strategies for both long and short term management should be discussed and the reasons for the variation in responses to changing patterns.</p> <p>Responses which characterise the top level may also recognise the more recent influence of climate change in delay and intensification of monsoon rains.</p>	15