Pearson
Edexcel

Mark Scheme (Results)

Pearson Edexcel GCSE
In Geography A (1GA0)
Paper 01:The Physical Environment

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications are awarded by Pearson, the UK's largest awarding body. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk. Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

Pearson: helping people progress, everywhere

Pearson aspires to be the world's leading learning company. Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

Autumn 2020
Publications Code 1GA0_01_2011_MS
All the material in this publication is copyright
© Pearson Education Ltd 2020

General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Paper 1 Mark scheme

Question number	Answer	Mark
1 (a) (i)	Award 1 mark for any of the following: Chalk (1) Limestone (1) Sandstone (1) **Accept any other appropriate response**	(1)

Question number	Answer	Mark
1 (a) (ii)	C – layered structure Sedimentary rocks have a layered structure. They are not formed by cooling (A), do not have a crystal structure (B) and are not formed by heating (D).	(1)

Question number	Answer	Mark
1(b)	Award 1 mark for each descriptive point about the relief in grid square A or 1 mark for a point and a further 1 mark for development of that point, up to a maximum of 2 marks. The relief is steep (1) with the contours being close together (1). The area is quite hilly (1) and there is a valley (1). There is a hill (1) with a maximum height of 125m (1). **Accept any other appropriate response**	(2)

Question number	Answer	Mark
1 (c)	Award 1 mark for identifying an effect of forestry and a further 1 mark for explaining how this affects the landscape, up to a maximum of 2 marks. The planting of large areas of coniferous forest (1) can reduce the variety of trees in a landscape (1). The planting of large areas of forest (1) can make the landscape look very similar/bland (1). The cutting down of large areas of forest (1) reduces the biodiversity of a landscape (1). Trees can hold back the soil (1) which reduces flooding (1). **Accept any other appropriate response**	(2)

Question number	Answer	Mark
2 (a)	D – wave cut platform Landform X is a wave cut platform. It is not an arch (A), spit (B) or stack (C).	(1)

Question number	Answer	Mark
2 (b)	Award 1 mark for any of the following: Biological (1) Chemical (1) Freeze thaw (1) Mechanical/ physical (1) Solution (1) **Accept any other appropriate response**	(1)

Question number	Answer	Mark
2 (c)	Award 1 mark for identifying a disadvantage of groynes and a further 1 mark for explanation, up to a maximum of 2 marks. Groynes can trap beach sediment (1) which means that the beach further along the coastline can be starved of sediment (1). The beach further along the coast may become narrower (1) as the groynes trap beach sediment (1). Wooden groynes will rot (1) and can be expensive to replace (1). Groynes involve a lot of construction (1) which means that they cost a lot to build (1). Groynes do not look very attractive (1) which may lead to fewer tourists visiting an area (1). **Accept any other appropriate response**	(2)

Question number	Answer
2 (d)	**AO3 (4 marks)/ AO4 (4 marks)** **AO3** • The geological structure running along the southern coastline is concordant, with a band of limestone running along the coastline. This is a relatively resistant rock type. • As a result of this, the southern section of the coastline is largely straight. • This is because processes such as abrasion and hydraulic action have less of an impact over time on more resistant rock. • Although the prevailing wind is from the south-west, meaning that the fetch is facing the southern stretch of the coastline, the relatively resistant limestone reduces the rate of erosion. • Along the eastern stretch of the coastline the geology is discordant with alternating bands of more and less resistant rock. • The waves have eroded through the less resistant rocks (clay and sand) more rapidly than the more resistant rocks (limestone and chalk).

	• Processes such as abrasion and hydraulic action are able to erode the less resistant rock more rapidly. • The more resistant rocks have been eroded less rapidly and form headlands. • The less resistant rocks (clay and sand) have been eroded more rapidly to form bays between the protruding headlands. • Weathering and mass movement processes have also contributed to the denudation of the coastline. **AO4** • The geology runs parallel to the southern coastline (concordant). • The geology runs perpendicular to the eastern coastline (discordant). • The coastline which runs from west to east is straight while the coastline which runs from north to south is indented. • The less resistant rocks forming the bays are clay and sands. • The more resistant rocks forming the headlands are chalk and limestone. • There are two bays on the eastern side of the coastline. These are Durlston Bay and Swanage Bay. • Durlston Bay is approximately 1.2km across and 0.7km in depth. • Swanage Bay is approximately 2.5km across and 1.5km in depth. • There are four headlands along the eastern stretch of coastline. These are called The Foreland, Ballard Point, Peveril Point and Durlston Head. • The extent to which the headlands stick out from the coastline varies. • The Foreland protrudes out the furthest (approximately 1.5km) followed by Peveril Point (approximately 0.7 km) and then Durlston Head (approximately 0.2 km). • The headland to the north (The Foreland) protrudes further than the headlands to the south.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–3	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	4–6	• Applies understanding to deconstruct information and provide some logical connections between concepts. An unbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark
3 (a)	C - point bar The landform Y is a point bar. It is not a set of interlocking spurs (A), a levee (B) or a river cliff (D).	(1)

Question number	Answer	Mark
3 (b)	Award 1 mark for any of the following: Attrition (1) Abrasion/ corrasion (1) Hydraulic action (1) Solution/ corrosion (1) Lateral erosion(1) Vertical erosion(1)	(1)

Question number	Answer	Mark
3 (c)	Award 1 mark for identifying a reason why heavy rainfall causes flooding and a further 1 mark for explanation, up to a maximum of 2 marks. Heavy rainfall can cause the ground to be saturated (1) leading to rapid surface runoff (1). Heavy rainfall can cause lots of surface runoff (1) causing river discharge to increase rapidly (1). Heavy rainfall can cause the river discharge to increase rapidly (1) exceeding the bankfull capacity (1). The river channel will not have sufficient capacity for all the rainwater (1) which will cause it to overflow (1).	

	Accept any other appropriate response	(2)

Question number	Answer
3 (d)	**AO3 (4 marks)/ AO4 (4 marks)** **AO3** • There is a range of advantages and disadvantages linked to the use of washlands as a flood protection method in this area. • Advantages include: - the washlands allow areas either side of the river/stream to be deliberately flooded - they can store a large volume (450,000m^3)of water and help to protect the area against a 1 in 25 year flood - they help to protect large numbers of homes and businesses from flooding downstream and also help to protect the schools shown on the map - the controlled nature of the flooding means that there is less disruption to people's lives - the reduction of flooding will also help to reduce the economic costs caused by flooding (e.g. damage to buildings) - the creation of washlands also help to preserve parkland areas within an urban environment and also create new habitats • Disadvantages include: - there was a significant economic cost involved in creating the washlands (£4.5 million) - there will be maintenance costs to ensure that they continue to operate effectively - although they are designed to protect the area from a 1 in 25 year flood there is still the possibility that there will be a flood of sufficient size that it affects other areas - parts of the area covered by the washlands were once used for housing and industry – which may be needed in a relatively densely populated area - when the washlands flood they will not be available for use by people (e.g. for recreation) - although the washlands may look natural they do involve some construction (e.g. earth banks to retain the water) which may look unsightly **AO4** • The River Beam flows from south to north across the map. • It is joined by a tributary (Wantz Stream) in the south-east corner. • The Wantz Stream flows from north-west to south-east.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–3	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	4–6	• Applies understanding to deconstruct information and provide some logical connections between concepts. An unbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

	• It joins the River Beam approximately 250 metres to the north of the edge of the Country Park boundary. • An area of 'U'- shaped washlands has been created along the rivers. • The washlands are approximately 900 metres in length from north to south and 100-200 metres wide. • They are located on both sides of the two rivers. • There is a school in between the area of washlands in the northern part of the map. There is also a school to the south of the Wantz Stream. • There are areas of housing in the south-west and south-east corners of the map. • There is another area of housing between the A road and the school in the northern part of the map. • There are several major roads on the map, including in the northern and south-west sections of the map. • Reference to information from the text boxes may be credited (e.g. 'the floodplain provides safe storage of 450,000$m^3$of water') if they are linked to the question.

Question number	Answer	Mark
4 (a)	A – arête (1) The landform Z is an arête. It is not a hanging valley (B), terminal moraine (C) or truncated spur (D).	(1)

Question number	Answer	Mark
4 (b)	Award 1 mark for any of the following: Landslide/ sliding/ slides (1) Slumping Soil movement (1) Rock falls (1) **Accept any other appropriate response**	(1)

Question number	Answer	Mark
4 (c)	Award 1 mark for identifying a way that glaciers transport material and a further 1 mark for explanation of this way, up to a maximum of 2 marks. As the glacier moves downhill (1) it moves material which has fallen onto its surface (1). As the glacier moves downhill (1) it moves material which has been buried within the ice (1). Material which is at the base of a glacier (1) is moved downhill by meltwater (1). **Accept any other appropriate response**	(2)

Question number	Answer
4 (d)	**AO3 (4 marks)/ AO4 (4 marks)** **AO3** • There is a range of advantages and disadvantages linked to human activities in this area. • Advantages include: - there is a range of facilities on the map which provide opportunities for tourists - these opportunities will attract tourists to the area which will bring benefits such as employment and spending (multiplier effect) - the development of mining in the past in this area would have helped to create jobs and generate income – and create employment in linked sectors - the hydro-electric plant will provide a renewable source of energy as well as creating jobs - it is also a relatively non-polluting form of energy production • Disadvantages include: - the large numbers of tourists may lead to littering as well as to significant footpath erosion - tourists may also disturb wildlife and damage habitats - large amounts of air pollution may be created by tourist vehicles, particularly in summer - tourism may also lead to traffic congestion - the café at the summit and the railway may not blend in well with the surrounding landscape - the decline of mining will have led to job losses in this region - the mining has polluted the water in the lake - the hydro-electric plant and linked buildings and facilities may spoil the landscape – with the lake which has been dammed no longer being natural – which may have affected water-borne wildlife and ecosystems - the spread of sheep farming across this landscape has led to the removal of natural woodland and destruction of habitats **AO4** • The area shown in Figure 4b consists of an upland glaciated area with a number of steep sided mountains (e.g. Snowdon). • There are steep-sided arêtes leading up to the summit. • The majority of the landscape looks 'natural'. • Sheep farming has stripped the natural (wooded) vegetation from lower levels.

	• There is evidence of footpath erosion with several wide footpaths being evident on the sides of Snowdon. • Most of these footpaths travel in a west-to-east direction. • They initially follow the valley floor before heading up the valley end towards the summit. • There is a train to the summit with the track running from north-to-south. • There is a main road in the north-east corner of the map which runs from south-east to north-west. • This road takes tourists to the honeypot area of Pen-Y-Pass where there is a Youth Hostel. • Reference to information from the text boxes may be credited (e.g. there is a railway which was opened in 1896) if they are linked to the question.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–3	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	4–6	• Applies understanding to deconstruct information and provide some logical connections between concepts. An unbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark
5 (a) (i)	C – 1470 (1) The year where the temperature line was lowest is 1470. The line was higher than this year in 1150 (A), 1310 (B) and 1920 (D).	(1)

Question number	Answer	Mark
5 (a) (ii)	Working to show: 0.7 - -0.5 Correct answer is 1.2^{o}C Max of 1 mark if no working shown but correct answer or correct method but incorrect answer.	(2)

Question number	Answer	Mark
5 (b)	Award 1 mark for any of the following: Historical sources (1) Ice cores (1) Pollen records (1) Sea level change (1) Tree rings (1) **Accept any other appropriate response**	(1)

Question number	Answer	Mark
5 (c)	Award 1 mark for identifying a negative effect of climate change on the environment and a further 2 marks for explanation, up to a maximum of 3 marks. It is causing sea levels to rise (1) which is putting large areas of coastline at risk of flooding (1) leading to the destruction of beaches (1). Climate change is leading to the retreat of glaciers (1) as they are melting (1) which means that loss of ice is greater than accumulation (1). Rising temperatures may lead to the extinction of particular animal/ plant species (1) as their habitat is changing faster than they can adapt (1) which may mean that they can no longer get sufficient food (1). Climate change is leading to droughts (1) which may reduce the water available to plants (1) which may die (1). **Accept any other appropriate response**	(3)

Question number	Answer	Mark
6 (a) (i)	B – Gulf Stream This current is moving from the Equator towards the Poles. The other three currents are moving from the Poles towards the Equator.	(1)

Question number	Answer	Mark
6 (a) (ii)	Award 1 mark for a relevant way that ocean currents redistribute heat energy and a further 1 mark for development of this way, up to a maximum of 2 marks. The ocean currents transport warm water (1) which moves energy from the Equator to the Poles (1). Allow mirror image of above response e.g. the movement of cold water. **Accept any other appropriate response**	(2)

Question number	Answer	Mark
6 (b) (i)	Award 1 mark for identifying a human cause of drought, and a further 3 marks for explanation of this cause, up to a maximum of 4 marks. Widespread deforestation for farming (1) can reduce the amount of transpiration (1) which reduces the amount of moisture in the atmosphere (1) which leads to less rainfall (1). The construction of dams for water storage (1) can lead to the storage of water behind the dam (1) which reduces the amount of water flowing downstream (1) which leads to a shortage of water (1). The burning of fossil fuels (1) is leading to rising temperatures (1) which can lead to lower rainfall in some places (1) reducing the amount of water available (1).	

	Drought refers to an event of prolonged shortage in the water supply. It can arise due to meteorological, hydrological or human causes. In the context of this question there needs to be a human link to the cause. **Accept any other appropriate response**	(4)

Question number	Answer	Mark
6 (b) (ii)	Award 1 mark for a relevant government response to drought and a further mark for explanation of this response, up to a maximum of 2 marks. Governments can introduce education programmes (1) which can encourage people to use less water (1). Governments can provide emergency water supplies (1) which mean that people have more drinking water (1). The introduction of water restrictions by governments (1) can reduce the consumption of water (1). Afforestation programmes set up by governments (1) can increase transpiration and therefore rainfall (1). **Accept any other appropriate response**	(2)

Question number	Answer	Mark
6 (c) (i)	4	(1)

Question number	Answer	Mark
6 (c) (ii)	Award 1 mark for any of the following:	

	Sea surface temperature of 26°C / 27°C or above (1) Warm water to a depth of at least 50m (1) **Accept any other appropriate response**	(1)

Question number	Answer	Mark
6 (c) (iii)	Award 1 mark for identifying a relevant impact of Hurricane Maria which can be seen in the resource and a further 1 mark for explanation of this impact, up to a maximum of 2 marks for each part. Electricity cables have been blown down (1) which will make communication difficult (1). Debris has fallen onto the road (1) which may cause injuries (1). Cars have been damaged by falling debris (1) which may block roads (1). Buildings have been damaged (1) which may cost a lot to repair (1). **Accept any other appropriate response**	(4)

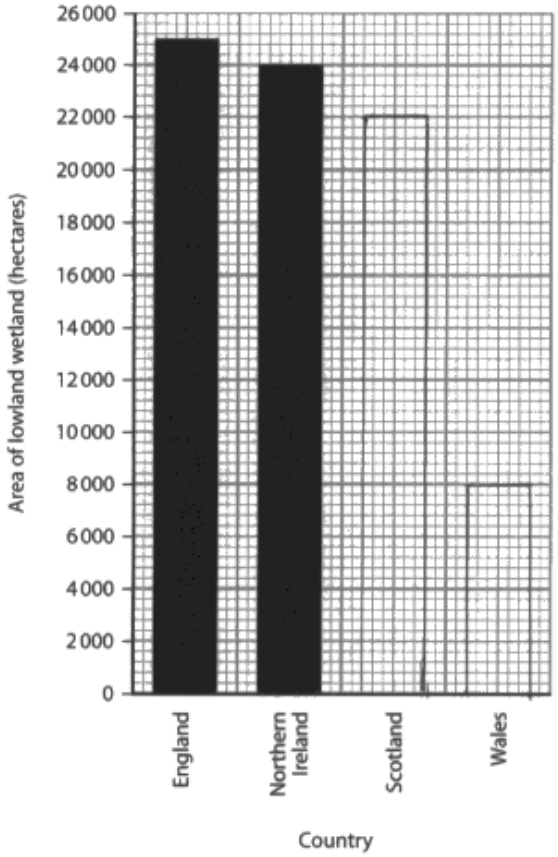
Question number	Answer	Mark
6 (d)	**AO2 (4 marks)/ A03 (4 marks)** **AO2** • Potential impacts in developed countries can include some deaths and injuries. • These are normally numbered in the 10s or 100s rather than 1000s. • There may also be significant disruption to normal lives – including being required to evacuate an area – as well as the disruption caused by property damage and subsequent recovery. • The scale of the damage to property can be significant, being measured in US$10-100 billion. • There may be significant economic impacts, leading to a short-term reduction in GNI. • Recovery may take months. • Potential impacts in developing countries can include significant numbers of deaths and injuries (often in the 1000s). • There is likely to be significant disruption to normal lives and recovery may take years. • There may be a significant reduction in GNI which may continue for several years. • The value of property damage is likely to be in terms of a US$1-5 billion. **AO3** Evaluation will depend on the specific case studies, but may include: • The impact in terms of the number of lives lost and injuries tends to be less in developed countries. • This is because they are better prepared for tropical cyclones owing to their levels of wealth. • This means that they have better early warning systems in place (e.g. satellite tracking) and are able to organise evacuation of the area that is likely to be affected. • Developed countries are also likely to be able to respond better to the effects of a tropical storm (including the provision of medical help). • The impact in terms of the destruction of property tends to be greater in developed countries.	

	• This is mainly because the value of the property is much greater than in developing countries. Therefore although it may be able to cope better with the effects of the storm, any destruction is very costly in value terms. • However, rebuilding of damaged property is also likely to be much quicker in developed countries – helped by their wealth and the fact that most of the property would have been insured. **Note: Candidates are required to study the impacts of tropical cyclones in a named developed and a named emerging or developing country and are likely to adopt this contrasting approach.**	(8)

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–3	• Demonstrates isolated elements of understanding of concepts and the interrelationship between places, environments and processes. (AO2) • Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3)
Level 2	4–6	• Demonstrates elements of understanding of concepts and the interrelationship between places, environments and processes. (AO2) • Applies understanding to deconstruct information and provide some logical connections between concepts. An unbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements are supported by evidence occasionally. (AO3)
Level 3	7–8	• Demonstrates accurate understanding of concepts and the interrelationship between places, environments and processes. (AO2) • Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3)

Question number	Answer	Mark
7 (a) (i)	Award 1 mark for the following: The biosphere is the part of the planet Earth where life can exist (1). **Accept any other appropriate response**	(1)

Question number	Answer	Mark
7 (a) (ii)	Working to show: 15 million/ 125 million x 100 (or similar) Correct answer is 12% Max of 1 mark if no working shown but correct answer or correct method but incorrect answer.	(2)

Question number	Answer	Mark
7 (b) (i)	Award 1 mark for each correct plot (2x1) (b) Wetlands are one of the UK's main terrestrial ecosystems. Study Figure 7b below.  	(2)

Question number	Answer	Mark
7 (b)(ii)	Award 1 mark for any of the following: Moorlands (1) Heathlands (1) Woodlands (1) **Accept any other appropriate response**	(1)

Question number	Answer	Mark
7 (c) (i)	Award 1 mark for a reason why the tropical rainforest is under threat and a further 1 mark for development of this reason and a further 1 mark for a link to evidence from the resource, up to a maximum of 3 marks. Farming is being developed (1) so that more food can be grown (1) which leads to the deforestation of the rainforest (1). The area is being deforested (1) for mining (1) so that minerals can be exported (1). The trees are being cut down (1) to provide land for a new dam (1) which may lead to a reduction in biodiversity (1). Deforestation is taking place (1) to allow urban areas to expand (1) and house a growing population (1). **Accept any other appropriate response**	(3)

Question number	Answer	Mark
7 (c) (ii)	Working to show: 3 505932 - 3 321 065 =184 867	

	184 867/ 3 505 932 x 100 (or similar) Correct answer is 5.3% (to 1d.p.) Max of 1 mark if no working shown but correct answer or correct method but incorrect answer.	(2)

Question number	Answer	Mark
7 (c) (iii)	Award 1 mark for a way which can be identified from the resource and a further 1 mark for explanation of this way, up to a maximum of 2 marks for each part. The cabins are made from natural materials (1) which blend in with the forest (1). The cabins are relatively small scale (1) which means that only small areas of vegetation are removed (1). The cabins are built on stilts above the water (1) which means that only small areas of vegetation are removed (1). The cabins are made from natural materials (1) and local people may have been employed to build them. The employment of local people to build the cabins (1) will have helped protect their livelihoods (1). **Accept any other appropriate response**	(4)

Question number	Answer	Mark
7 (d) (i)	Award 1 mark for each identified adaptation from the resource and a further 1 mark for explanation, up to a maximum of 2 marks for each part. Leaves in deciduous woodland turn orange/ brown and then drop off in the autumn (1) to help save water in the winter months (1). The trunks of deciduous trees grow tall (1) so that they can reach the sunlight (1). The trunks of deciduous trees are quite thin (1) as they grow rapidly upwards to reach the sunlight (1). The leaves of deciduous trees tend to be quite wide (1) so that they can maximise absorption of sunlight (1). The deciduous woodland tends to be layered in structure (1) to maximise absorption of sunlight (1). **Accept any other appropriate response**	(4)

Question number	Answer	Mark
7 (d) (ii)	Award 1 mark for a relevant threat caused by climate change and a further 2 marks for explanation of this threat, up to a maximum of 3 mark. An increase in temperatures (1) may lead to more frequent drought (1) which could cause trees to die (1). An increase in global warming (1) may lead to more pests/diseases (1) which may damage/ kill trees (1). An increase in temperatures (1) may lead to a decline in the health of trees (1) which may cause some of them to die (1). Global warming (1) may lead to stronger winter storms (1) which may damage trees (1). Global warming (1) may lead to reduced rainfall (1) which may put stress on trees (1). **Accept any other appropriate response**	(3)

Question number	Answer	Mark
7 (e)	**AO2 (4 marks)/ A03 (4 marks)** **AO2** • The different large-scale ecosystems are found in latitudinal bands around the Earth. • These large-scale ecosystems include tropical, temperate and boreal forests, tropical and temperate grasslands, deserts and tundra. • These bands follow largely the global climatic belts. • These belts are influenced by the global atmospheric circulation which, in turn, is affected by variations in the amount of solar radiation received at the Earth's surface. • The climate has a determining influence on the environmental conditions found at different parts of the Earth's surface. • The ecosystems are adapted to these climatic variations which influence strongly the species found in each area and the interaction between different elements of the nutrient cycle. • Other physical factors, however, also affect the distribution of the large-scale ecosystems rainforest at varying scales. They include: - altitude – because temperatures decrease on average by 1^{o}C for every 100 metres gain in height, high mountains in the tropics can have colder temperatures and cannot support the tropical rainforest ecosystem - soils – the characteristics of an ecosystem can change when the underlying relief or geology produces different types of soil or soil conditions (e.g. poorly drained areas) • Human activity – deforestation of large areas of the tropical rainforest, for example, have led to changes in the ecosystem; human induced climate change may also be having an impact on the distribution. **AO3** Evaluation will depend on the specific large-scale ecosystems which are identified but may include: • Naturally, the main factor is climate.	

	• This plays a key role in controlling the distribution of the world's large-scale ecosystems. • For example, high temperatures and high rainfall are key factors in the rapid nutrient cycling in the tropical rainforests. • Low levels of sunlight/ heat and low levels of precipitation are limiting factors in tundra and polar environments. • However, there are some other physical factors affecting the distribution – e.g. altitude and variation in soil type. • For example, tropical rainforests are not found in the higher parts of the Andes mountain range in South America. • Human factors have played a key role – which arguably is increasing. • For example, human activity has resulted in the destruction of tropical rainforests and their replacement with agriculture or secondary forest; global warming, linked to the enhanced greenhouse effect, is leading to rising temperatures and a shift in the distribution of large-scale ecosystems such as the tropical rainforest and temperate forests.	(8)

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–3	• Demonstrates isolated elements of understanding of concepts and the interrelationship between places, environments and processes. (AO2) • Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3)
Level 2	4–6	• Demonstrates elements of understanding of concepts and the interrelationship between places, environments and processes. (AO2) • Applies understanding to deconstruct information and provide some logical connections between concepts. An unbalanced argument that synthesises mostly relevant understanding, but

		not entirely coherently, leading to judgements are supported by evidence occasionally. (AO3)
Level 3	7–8	• Demonstrates accurate understanding of concepts and the interrelationship between places, environments and processes. (AO2) • Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3)

Marks for SPGST		
Performance	**Marks**	**Descriptor**
SPaG 0	0	*No marks awarded* • Learners write nothing. • Learner's response does not relate to the question. • Learner's achievement in SPaG does not reach the threshold performance level, for example errors in spelling, punctuation and grammar severely hinder meaning.
SPaG 1	1	*Threshold performance* • Learners spell and punctuate with reasonable accuracy. • Learners use rules of grammar with some control of meaning and any errors do not significantly hinder meaning overall. • Learners use a limited range of specialist terms as appropriate.
SPaG 2	2–3	*Intermediate performance* • Learners spell and punctuate with considerable accuracy. • Learners use rules of grammar with general control of meaning overall. • Learners use a good range of specialist terms as appropriate.
SPaG 3	4	*High performance* • Learners spell and punctuate with consistent accuracy. • Learners use rules of grammar with effective control of meaning overall. • Learners use a wide range of specialist terms as appropriate.

Pearson Education Limited. Registered company number 872828
with its registered office at 80 Strand, London, WC2R 0RL, United Kingdom