



National
Qualifications
2019

2019 Geography

Physical and Human Environments

Higher

Finalised Marking Instructions

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General marking principles for Higher Geography

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- (e) Use the full range of marks available for each question.
- (f) The detailed marking instructions are not an exhaustive list. Award marks for other relevant points.
- (g) Award marks only where points relate to the question asked. Where candidates give points of knowledge without specifying the context, award marks unless it is clear that they do not refer to the context of the question.
- (h) Award marks for knowledge/understanding where points are
 - relevant to the issue in the question
 - developed (by providing additional detail, exemplification, reasons or evidence)
 - used to respond to the demands of the question (for example evaluate, analyse).

Marking principles for each question type

There is a range of question types in this question paper. For each question type, the following provides an overview of marking principles, and an example.

Describe questions

Candidates gain marks for making relevant, factual points. These should be key points. The points do not need to be in any particular order. Candidates may provide a number of straightforward points or a smaller number of developed points, or a combination of these. Candidates must provide more than an outline or list to gain marks. They could refer to, for example, a landscape feature, a landscape formation process, a situation or facts demonstrating geographical knowledge.

Explain questions

Candidates gain marks for explaining or suggesting reasons for the cause or impact of something, or for referring to causal connections and relationships. Candidates must do more than describe to gain marks here.

- Where the question asks about a landscape feature, candidates should refer to the processes leading to landscape formation.
- For a source-based question, candidates should make use of these and refer to them within their answer for full marks.

Where candidates provide a purely descriptive answer, or one where development is limited, award no more than half the available marks for the question. Other questions look for candidates to demonstrate higher-order skills and will use command words such as analyse, evaluate, to what extent, and discuss.

Analyse questions

Candidates gain marks for identifying parts, the relationship between them, and their relationships with the whole; and for drawing out and relating implications. Award an analysis mark where candidates use their knowledge and understanding or a source to identify relevant components (for example of an idea, theory, argument) and clearly show at least one of the following

- links between different components
- links between component(s) and the whole
- links between component(s) and related concepts
- similarities and contradictions
- consistency and inconsistency
- different views or interpretations
- possible consequences or implications
- the relative importance of components
- understanding of underlying order or structure.

Where candidates are asked to analyse they should identify parts of a topic or issue and refer to the interrelationships between, or impacts of, various factors. For example, where a question asks for an analysis of the soil-forming properties which lead to the formation of a gley soil, candidates should refer to how the various soil formatting properties contributed to its formation.

Evaluate questions

Candidates gain marks for making a judgement of the success, failure, or impact of something based on criteria. They should give a brief description of the strategy or project being evaluated, before offering an evidenced conclusion.

Account for questions

Candidates gain marks for giving reasons which are often (but not exclusively) from a resource, for example: for a change in trade figures; a need for water management; or differences in development between contrasting developing countries.

Discuss questions

Candidates gain marks for exploring ideas about a project, or the impact of a change. They should consider different views on an issue or argument. This might not be a balanced argument, but they should give a range of impacts or ideas within their answer.

To what extent questions

Candidates gain marks for considering the impact of a management strategy or strategies they have explored. They should give a brief description of the strategy or project being evaluated, before offering an evidenced conclusion. They do not need to offer an overall opinion based on a variety of strategies, but should assess each separately.

Marking instructions for each question

Section 1 – Physical environments

Question	General marking principle for this type of question	Max mark	Specific marking instructions for this question
1.	<p>Check any diagram(s) for relevant points not present in the text and award marks accordingly.</p> <p>Candidates can gain full marks for well-annotated diagrams that explain the formation of a corrie.</p> <p>Award a maximum of 1 mark where candidates provide a list of unexplained processes with at least two processes required for this mark.</p> <p>Award a maximum of 4 marks where candidates provide two fully developed processes (up to 2 marks per developed process). A mark for a named process should only be awarded if the candidate develops this in some way.</p> <p>Award a maximum of 2 marks for the formation of a glacier.</p> <p>Award a maximum of 1 mark for a correctly named example.</p>	8	<p>Points may include</p> <p>Glacier formation includes</p> <ul style="list-style-type: none"> • snow accumulates in north facing hollows (1 mark) when more snow falls in winter than melts in the summer (1 mark) • north/north-east facing slopes are more shaded so snow lies longer (1 mark) with accumulated snow compressed into neve and eventually ice. (1 mark) <p>Processes include</p> <ul style="list-style-type: none"> • plucking (1 mark) when ice freezes on to bedrock, pulling loose rocks away from the backwall (1 mark) • abrasion (1 mark) when the angular rock embedded in the ice grinds the hollow (1 mark) • frost shattering/freeze thaw weathering(1 mark) when water in cracks in the rock freezes, expands and contracts weakening the rock until fragments break off. (1 mark) <p>Corrie</p> <ul style="list-style-type: none"> • Glacier moves downhill due to gravity (1 mark) • Bergschrund crevasse opens up at the back of the hollow (1 mark) • this allows meltwater and rock fragments to get to the base of the glacier increasing erosive power (1 mark) • the weight of the glacier pushes down causing rotational sliding, (1 mark) which over deepens the hollow (1 mark) • friction causes the ice to slow down at the front edge of the corrie, (1 mark) allowing a rock lip to form which traps rain water (1 mark) • an example is Brown Cove. (1 mark) <p>Or any other valid point.</p>

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2.	<p>Check any diagram(s) for relevant points not present in the text and award marks accordingly.</p> <p>Candidates can gain full marks for well-annotated diagrams that explain the formation of a sand spit.</p> <p>Award a maximum of 4 marks where candidates provide a fully developed explanation of longshore drift. A mark for a named process should only be awarded if the candidate develops this in some way.</p> <p>Award a maximum of 1 mark for a list of unexplained processes with at least two processes required for this mark.</p> <p>Award a maximum of 1 mark for a correct named example.</p>	8	<p>Points may include</p> <p>Processes include</p> <ul style="list-style-type: none"> • sand spits are formed by the process of longshore drift (1 mark) • Swash (1 mark) is where waves, driven by prevailing wind push material up the beach at an angle (1 mark) • the returning backwash (1 mark) is dragged back by gravity down the beach at right angles. (1 mark) <p>Spit</p> <ul style="list-style-type: none"> • spits form when there is a change in direction on a coastline (1 mark) • allowing a sheltered area for deposition (1 mark) • material slowly builds up to appear above the water (1 mark) • the spit develops as long as the supply of deposits is greater than the amount of erosion (1 mark) • the shape can become hooked or curved at the end in response to changes in wind direction/currents (1 mark) • a salt marsh may form in a sheltered area behind a sand spit (1 mark) • an example is Spurn Head. (1 mark) <p>Or any other valid point.</p>

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3.	(a) and (b)	<p>Award a maximum of 5 marks for either description (including a maximum of 2 marks for correctly named currents one warm and one cold) or explanation.</p> <p>Candidates must include both descriptions and explanation for full marks.</p> <p>Candidates may answer each command separately or as a holistic answer.</p> <p>Award marks accordingly.</p>	8	<p>Points may include</p> <p>Description of pattern of ocean currents in Atlantic may include</p> <ul style="list-style-type: none"> • currents follow loops or gyres, (1 mark) clockwise in the Northern Atlantic (1 mark) • warm currents travel from the equator towards the Poles (1 mark) for example The North Atlantic Drift (1 mark) • cold currents return cool water from the poles (1 mark) for example The Labrador. (1 mark) <p>Explanations may include</p> <ul style="list-style-type: none"> • ocean currents are greatly influenced by the prevailing winds (1 mark) with energy being transferred by friction to the ocean currents (1 mark) • land masses like North America divert ocean currents (1 mark) • due to differential heating and/or salinity, (1 mark) density differences occur in water, (1 mark) resulting in chilled polar water sinking, (1 mark) spreading towards the Equator and displacing warm water pole wards (1 mark) • the Coriolis effect deflects currents to the right in the Northern Hemisphere. (1 mark) <p>Or any other valid point.</p>

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4.	(a) and (b)	<p>Candidates must include both descriptions and explanation for full marks. Award a maximum of 5 marks for descriptions.</p> <p>Candidates may answer each command separately or as a holistic answer.</p> <p>Award marks accordingly.</p>	10	<p>Points may include</p> <p>Descriptions may include</p> <ul style="list-style-type: none"> • there is a lag time of five hours (1 mark) • there is a slow rise in discharge until 14:00 (1 mark) • there is a gentle rising limb until 22:00 (1 mark) when the rising limb becomes steeper (1 mark) leading to a peak discharge of 85 cumecs at 02:00 (1 mark) • there is a steep recession limb from 02:00 until 06:00. (1 mark) <p>Explanations may include</p> <ul style="list-style-type: none"> • this is caused by the initial rainfall which began at 11:00 (1 mark) • this rain may have been intercepted by vegetation (1 mark) • the water may also have infiltrated and be stored in the soil (1 mark) • the river rises because soil storage has been exceeded (1 mark) • there may be a low number of tributaries transporting water to the channel slowly (1 mark) • it may be a large catchment area meaning more travel time to the main channel (1 mark) • the catchment area may be gently sloping leading to slower initial overland flow to the channel. (1 mark) <p>Some candidates may focus only on the lag time and the latter (steeper) part of the rising limb and should be credited accordingly.</p> <p>Or any other valid point.</p>

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5.	<p>Check any diagram(s) for relevant points not present in the text and award marks accordingly.</p> <p>Candidates can gain full marks for well-annotated diagrams that explain the formation of a waterfall.</p> <p>Award a maximum of 4 marks where candidates provide two fully developed processes (up to 2 marks per developed process). A mark for a named process should only be awarded if the candidate develops this in some way.</p> <p>Award a maximum of 1 mark for a list of unexplained processes, with at least two processes required for this mark.</p>	8	<p>Points may include</p> <ul style="list-style-type: none"> • hydraulic action (1 mark) which is when air is compressed into the river bank causing materials to be dislodged (1 mark) • abrasion (1 mark) when the force of the water throws bedload against the banks causing erosion (1 mark) • solution (1 mark) when soluble rocks react with acids in the water (1 mark) • differential erosion takes place (1 mark) over bands of more and less resistant rock/where harder rock is overlaying softer rock/bands of hard/soft rock (1 mark) • softer rock is more easily eroded (1 mark) • undercutting causes an overhang of the hard rock (1 mark) • over time the hard rock is unsupported (1 mark) and collapses due to gravity into the plunge pool (1 mark) • attrition can occur here (1 mark) where the rocks in the plunge pool hit off each other, eroding further (1 mark) • the waterfall retreats upstream. (1 mark) <p>Or any other valid point.</p>
6.	<p>For 1 mark candidates may give one limited explanation.</p>	8	<p>Points may include</p> <ul style="list-style-type: none"> • low temperatures lead to slow decomposition (1 mark) • coniferous needles and cones produce acidic (mor) humus (1 mark) • high precipitation leads to leaching (1 mark) which is the downward movement of the aluminium and iron oxides (1 mark), this leads to formation of an iron pan between the A/B horizons (1 mark) • this iron pan may impede drainage causing water logging (1 mark) • eluviation leaves an ash grey A horizon (1 mark) • illuviation leads to a reddish brown B horizon (1 mark) • limited soil biota leads to well defined horizons (1 mark) • found on steep slopes, this further encourages leaching (1 mark) • shallow roots mean limited absorption of deep leached minerals (1 mark) • shallow roots also mean limited nutrient recycling. (1 mark) <p>Or any other valid point.</p>

Section 2 – Human environments

Question	General marking principle for this type of question	Max mark	Specific marking instructions for this question
7.	<p>Candidates could discuss the positive and/or negative consequences of the predicted population structure.</p> <p>Care should be taken to ensure consequences are relevant to developed countries.</p>	9	<p>Points may include</p> <ul style="list-style-type: none"> • the increase in elderly will lead to an increased cost of pensions to the government (1 mark) and increased tax contributions for the economically-active population (1 mark) • in-migration may need to be encouraged (1 mark) which may lead to tension between different cultures and or ethnic groups (1 mark) • the retirement age may need to be increased (1 mark) and more services for older people provided, such as care homes (1 mark) • there may be a lower unemployment rate in the future (1 mark) however a decrease in the economically active population may lead to a skills gap (1 mark) • citizens may be encouraged to invest in private healthcare schemes and/or pensions (1 mark) • the falling birth rate may lead to a decline in demand for services for children such as schools (1 mark) • there will be an increased strain/costs on the Health Service to meet the needs of the ageing population (1 mark) for example more hip-replacements or heart medication (1 mark) • there may also be more demands placed on adult children to care for elderly parents (1 mark) • there may be an increase in robots doing the jobs of people. (1 mark) <p>Or any other valid point.</p>

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8.		Award 1 mark for each relevant point.	6	<p>Points may include</p> <ul style="list-style-type: none"> • census is a survey carried out every 10 years (1 mark) • each householder is asked to complete a detailed questionnaire about the number of people living in their home (1 mark) • householders answer other questions on their social, economic and cultural background (1 mark) • civil registration of births, deaths (1 mark) provides an up-to-date count between censuses (1 mark) • Scottish Household Survey is a continuous survey(1 mark) based on a random sample of the population (1 marks) which is cheaper than carrying out a full census (1 mark) • governments also collect data on migration, for example visa applications (1 mark) and NHS records provide health data. (1 mark) <p>Or any other valid point.</p>

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9.	<p>Candidates should discuss the positive and/or negative impacts of land degradation.</p> <p>Award a maximum of 1 mark for a specific named example of a tribe, city, region within a country or event.</p>	8	<p>Points may include</p> <p>For Africa, north of the Equator</p> <ul style="list-style-type: none"> • RLD can lead to crop failures and the death of livestock (1 mark) which can cause an increase in malnutrition and starvation (1 mark) which in turn can detrimentally impact child development (1 mark) • there may be large-scale migration (1 mark) into overcrowded urban areas, causing more pressure and the growth of shanty towns (1 mark) • migration can also lead to conflict between ethnic groups as people move (1 mark) for example Darfur (1 mark) leading to the growth of large refugee camps (1 mark) • countries are becoming increasingly reliant on international aid (1 mark) or paying back high interest loans (1 mark) • the soil structure deteriorates as the wind blows it away (1 mark) causing the advance of the Sahara Desert – desertification. (1 mark) <p>For the Amazon Basin</p> <ul style="list-style-type: none"> • RLD can lead to destruction of the way of life of the indigenous people (1 mark) for example the Yanomami (1 mark) • it can also lead to the destruction of sustainable development of rubber plantations (1 mark) • the creation of reservations for indigenous people who have lost their land (1 mark) has contributed to an increase in ‘western’ diseases and alcoholism (1 mark) • it has an adverse effect on the nutrient cycle (1 mark) in the rainforest due to a lack of leaf litter reducing the fertility of the soil (1 mark) • the top soil can be removed due to increased surface run-off, (1 mark) resulting in the silting up of rivers (1 mark) • the loss of biodiversity with danger of extinction. (1 mark) <p>Or any other valid response.</p>

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10.	<p>Award 1 mark for each relevant point</p> <p>If candidates discuss more than one area, mark all and award marks to the highest scoring section.</p> <p>Award a maximum of 2 marks for specific named examples within the chosen area.</p> <p>A maximum of 11 marks should be awarded if the answer does not clearly relate to a specific case study.</p>	12	<p>For the Lake District, points may include</p> <ul style="list-style-type: none"> • traffic congestion on narrow rural roads (1 mark) leads to high levels of air and noise pollution (1 mark) • tourists park on grass verges leading to erosion (1 mark) for example Bowness (1 mark) • tourists wander off footpaths widening them (1 mark) and stone walls can be damaged by people climbing over them (1 mark) • litter if eaten by wildlife or livestock can harm or kill (1 mark) • tourists leave gates open causing farm animals to escape (1 mark) • dogs off leash can worry sheep leading to miscarriages (1 mark) this will reduce the farmers income (1 mark) • speedboats on lakes can erode beaches (1 mark) and oil from engines can harm aquatic life (1 mark) • quarrying can produce large quantities of dust (1 mark) for example Honister Quarry (1 mark) which can settle on plants stunting their growth (1 mark) • this can also lead to visual pollution in spectacular landscapes (1 mark) • tourists buying second homes pushes prices up for locals (1 mark) and can lead to rural depopulation, (1 mark) which can reduce demand for local services which may close. (1 mark) <p>Or any other valid response.</p>

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11.		<p>Answers will depend on the case study referenced by the candidate.</p> <p>Award 1 mark for each explanation.</p> <p>Award a maximum of 1 mark for a specific named strategy within the chosen area.</p> <p>A maximum of 6 marks should be awarded if the answer does not clearly relate to a specific case study.</p>	8	<p>For Glasgow answers may include</p> <ul style="list-style-type: none"> • new tenement style housing has been built to create a community spirit (1 mark) • high rise flats demolished due to damp antisocial conditions (1 mark) • all the houses were architecturally designed with some of the houses representing the area's heritage (1 mark) which attracted people with a higher income to move to the area increasing the social and economic mix (1 mark) • public art has been used on the housing to help improve the attractiveness of the area (1 mark) • a new leisure centre was built to improve life expectancy in the area (1 mark) • the Legacy Hub (1 mark) is a new and improved community centre to meet the demands of the community (1 mark) it includes every day services such as dentist and a café (1 mark) • housing associations receive government grants to build more affordable housing (1 mark) • new energy efficient homes built (or refurbished) to lower energy bills (1 mark) for example Athletes village in Dalarnock. (1 mark) <p>Or any other valid response.</p>

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12.		<p>Award 1 mark for each relevant point.</p> <p>Award a maximum of 1 mark for a specific named example within the chosen city.</p> <p>A maximum of 5 marks should be awarded if the answer does not clearly relate to a specific case study.</p>	7	<p>For Mumbai answers may include</p> <ul style="list-style-type: none"> • the Mumbai Urban Traffic Project (1 mark) relays live images from traffic junctions to police headquarters (1 mark) allowing for real time adjustments of traffic signals (1 mark) which are synchronised to help commuters catch green lights to increase traffic flow (1 mark) • the cameras also pick up broken down vehicles and accidents allowing them to be dealt with quickly (1 mark) • the railways have been improved by adding new tracks and stations (1 mark) • 500 new eco buses have been purchased to reduce pollution (1 mark) • a monorail has been built to provide an affordable alternative for commuters (1 mark) • the Mumbai Metro Rail Corporation (1 mark) the agency who manage the metro line have appointed traffic marshals to help commuters (1 mark) • the Bandra-Worli (1 mark) sea link bridge reduces pressure on roads in to the city. (1 mark) <p>Or any other valid response.</p>

[END OF MARKING INSTRUCTIONS]



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Global Issues and Geographical Skills

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Marking instructions for each question

Section 1 – Global issues

Question		General marking principle for this type of question	Max mark	Specific marking instructions for this question
1.	(a)	Award 1 mark for each limited explanation.	10	<ul style="list-style-type: none"> • population increase would require additional water for domestic use (1 mark) • projected figure of 140 million in 2030 is double the population in 2000 (1 mark) • almost three quarters of the workforce depend on agriculture and can now grow crops during dry months (1 mark) and irrigation is required for crop production throughout the year (1 mark) • this would also allow increased crop production for export (1 mark) • a lack of rainfall from November – March increases the need for water to be stored (1 mark) • the irregular/seasonal flow of the Blue Nile, (1 mark) ranging from 200 cumecs from February – April to 5,600 cumecs in July/August (1 mark) can be managed to reduce the threat of flooding (1 mark) and to also allow for all-year round navigation (1 mark) • only 24% of the country has access to electricity, HEP from the dam could be used to improve this (1 mark) • excess energy produced could be exported to neighbouring countries such as Sudan (1 mark) • improved sanitation means that far less of the population will be at risk from diseases. (1 mark)

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	(b)	<p>Answers must discuss the possible negative impacts.</p> <p>Both socio-economic and environmental factors need to be mentioned to gain full marks.</p> <p>1 mark should be awarded for a developed explanation, or a more straightforward impact linked to the case study.</p> <p>Award a maximum of 7 marks if the answer is vague/does not relate to a specific named water management project.</p> <p>Award 2 marks where candidates give specific named examples within the case study area, which develop the answer.</p>	10	<p>For example the Grand Ethiopian Renaissance Dam</p> <ul style="list-style-type: none"> the displacement of 20,000 people from the site of the dam (1 mark) resulting in cost of resettlement to other areas (1 mark) those forced to relocate were mainly farmers with limited education, who found it difficult to find jobs (1 mark), resulting in less income and a poorer quality of life (1 mark) the project is very expensive, costing about US\$ 5 billion (1 mark), this is 15% of Ethiopia's GDP/60% of the total annual budget (1 mark), which critics claim could have been better spent on health or education (1 mark) HEP is only possible during the three month wet season (1 mark) lower amounts of water reaching Egypt's Aswan Dam has resulted in 20% less electricity being produced there (1 mark) Reduced flow from the Blue Nile into downstream countries such as Egypt of up to 25% (1 mark) and resulting loss of farmland through lack of irrigation (1 mark) the reservoir flooded Ethiopian forest, with loss of wildlife (1 mark) High temperatures mean water will be evaporated each year from the reservoir (1 mark) the reservoir will silt up and becoming less efficient over time (1 mark) less silt in the Blue Nile downstream (1 mark) which is used as a fertiliser, means farmers need to buy expensive artificial fertiliser (1 mark); with increased threat of water pollution and danger to aquatic life (1 mark) Sudan's brick industry relies on the river silt as a raw material (1 mark) the dam's pressure on the faulted and cracked rocks in this part of the East African Rift Valley could trigger earthquakes (1 mark), causing a collapse and loss of lives and property downstream. (1 mark) <p>Or any other valid point.</p>

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2.	(a)	Award 1 mark for each valid point.	6	<p>Points may include</p> <ul style="list-style-type: none"> • high percentage of a family's income may be spent on doctors' visits/drugs (1 mark) • this reduces the amount of money which can be spend on food/education (1 mark) • breeding season of mosquitoes coincides with harvesting time (1 mark) if families can't harvest crops, this leads to malnutrition (1 mark) • high proportion of nations GDP is spent on combatting disease leaving less to spend on improving infrastructure (1 mark) • high levels of absenteeism leads to lower literacy rates (1 mark) and this can lead to a less skilled workforce in the future (1 mark) • tourists may avoid the area reducing revenue from visitors (1 mark) • foreign companies may not invest in the area due to an unreliable workforce. (1 mark) <p>Or any other valid point.</p>

Question		General marking principle for this type of question	Max mark	Specific marking instructions for this question
	(b)	<p>Award 1 mark for each valid explanation.</p> <p>Award up to 2 marks where candidates give appropriate named examples which develop the answer, with a maximum of 1 mark should be awarded for a named example of each strategy</p>	14	<p>Points may include</p> <ul style="list-style-type: none"> • one method used was to spray pesticides/insecticides on walls in homes in an attempt to kill the Anopheles mosquitoes. (1 mark) For example, DDT (1 E mark) • breeding genetically-modified sterile mosquitoes. (1 mark), these cause the species to die out (1 mark) Other GM mosquitoes are unable to carry the parasite (1 mark) these are dominant mosquitoes and would outcompete the others (1 mark) • specially designed mosquito traps use CO₂ to mimic animals and humans (1 mark) BTI bacteria artificially grown in coconuts. (1 mark) The fermented coconuts are broken open after a few days and thrown into the mosquito larvae-infested ponds. (1 mark) The larvae eat the bacteria and have their stomach lining destroyed (1 mark) • putting larvae-eating fish into stagnant ponds or padi fields, (1 mark) such as the muddy loach (1 E mark) • flushing reservoirs every seven days (1 mark) as it takes longer than this period of time for the larvae to develop into adult mosquitoes (1 mark) • planting eucalyptus trees can help soak up excess moisture (1 mark) and reduce the amount of stagnant water/remove the breeding grounds (1 mark) • covering standing water and water storage cans, (1 mark) for example the Oxfam bucket, (1 EG mark) reduces the chances of mosquitoes breeding near to homes or villages (1 mark) • medication to kill the parasite/prevent infection (1 mark) such as quinine/chloroquine/Lariam/Malarone/Artemisia (1 EG mark) • trials have produced a vaccine (1 mark) such as RTS,S/Mosquirix (1 mark) which has now been recommended as being safe for use, as prevention is better than cure (1 mark) • educating people in the use of insect repellents (1 mark) or covering the skin at dawn/dusk (1 mark) when mosquitoes are most active, to reduce the chances of being bitten (1 mark) the increased use of insecticide-coated mosquito nets at night. (1 mark) For example the WHO's 'Roll Back Malaria' campaign. (1 mark) <p>Or any other valid point.</p>

Question		General marking principle for this type of question	Max mark	Specific marking instructions for this question
3.	(a)	<p>1 mark should be awarded for each valid point.</p> <p>Markers should take care not to credit human causes of climate change.</p>	8	<p>Possible answers may include</p> <p>Physical Causes</p> <ul style="list-style-type: none"> • Milankovitch's theory: changes in the earth's orbit/tilt (1 mark) alter the amount of energy reaching the Earth (1 mark) • every 41,000 years, there is a change in the tilt of the Earth's axis. (1 mark) A greater tilt means more sunlight in polar regions (1 mark) and over a 97,000-year cycle, the Earth's orbit stretches (1 mark) • global temperatures can be raised by peaks of sunspot activity, (1 mark) which follow an 11-year pattern (1 mark) • after volcanic eruptions, large amounts of dust and droplets of sulphur (1 mark) may reflect the sun's rays lowering temperature (1 mark) • retreating ice caps release additional fresh water (1 mark) leading to changes in oceanic circulation. (1 mark) This also reduces the albedo effect (1 mark) as reflection has decreased as more land is exposed. (1 mark) Methane being released from melting permafrost. (1 mark). <p>Or any other valid point.</p>

Question		General marking principle for this type of question	Max mark	Specific marking instructions for this question
	(b)	<p>Award 1 mark for each limited explanation.</p> <p>Award up to 2 marks where candidates give appropriate named examples which develop the answer.</p>	12	<p>Possible answers may include</p> <p>Local</p> <ul style="list-style-type: none"> • individuals can reduce, reuse and recycle products so that less refuse is sent to landfill sites. (1 mark) This will reduce the amount of methane entering the atmosphere (1 mark) • to reduce the amount of carbon dioxide generated by the burning of fossil fuels, (1 mark) households could reduce energy consumption by insulating their homes or switching lights off, etc (1 mark) • people could also be encouraged to use public transport, walk or cycle, (1 mark) or use hybrid or electric cars to cut down on fossil fuel consumption (1 mark) • disposal of older fridges should be managed carefully to ensure CFC gases don't escape. (1 mark) New cooling units no longer emit CFC's. (1 mark) <p>National</p> <ul style="list-style-type: none"> • Government Policies such as 'Helping Households to cut their Energy Bills' (1 E mark) encourages the use of smart meters improving energy efficiency (1 mark) • increasing the use of low carbon technologies such as windfarms (1 mark) – the UK Government is committed to creating 15% of energy by renewable source. (1 mark) <p>Interational</p> <ul style="list-style-type: none"> • the Paris Agreement (1 E mark) outlined agreements between leaders of developed and developing countries to limit climate change to below a 2°C rise (1 mark) • the European Union has committed to reducing carbon emissions by 20% by 2020. (1 mark) The EU will reward developing countries financially (1 mark) • preparing for extreme weather events such as flooding (1 mark) defences could be built to hold back flood water. (1 mark) for example The Thames Flood Barrier (1 EG mark) <p>Credit any other valid responses.</p>

Question			General marking principle for this type of question	Max mark	Specific marking instructions for this question
4.	(a)	(i) and (ii)	1 mark should be awarded for each trend. 1 mark should be awarded for evidence from the graph. Award a maximum of 3 marks for description of the graph.	10	<p>There is an initial drop from 1980 to 1982 (1 mark) from 180 to 170 qBtu. (1 mark) There is a gradual rise until 2005 (1 mark) when it reaches 250 qBtu. (1 mark) Consumption levels off from 2005 until 2010. (1 mark) The increase then rises more slowly until 2018 (1 mark) where it reaches 270 qBtu. (1 mark) This level is projected to continue to 2030. (1 mark)</p> <p>The periods of increasing energy consumption may be due to</p> <ul style="list-style-type: none"> increased vehicle ownership due to 2 or more car household (1 mark) therefore increased demand for petrol (1 mark) increased ownership of electronic devices such as computers (1 mark) due to changing technology and affordability (1 mark) increased standard of living and/or more single occupancy households (1 mark) leading to more houses with central heating systems. (1 mark) <p>For developed countries, the rate of increase in energy consumption is projected to slow down due to a number of reasons, including</p> <ul style="list-style-type: none"> improved energy efficiency in residential sector (1 mark) for example energy-saving fridges and LED lighting (1 mark) improved insulation of housing such as cavity wall insulation (1 mark) cuts down on heat loss causing less heating to be required (1 mark) growth of more affordable, fuel efficient 'greener' hybrid cars (1 mark) Government initiatives such as 'Cycle to Work' schemes (1 mark) encourage people to leave their cars at home by subsidising the cost of cycle purchase. (1 mark) <p>Or any other valid point.</p>

Question		General marking principle for this type of question	Max mark	Specific marking instructions for this question
	(b)	<p>Award 1 mark for each point on effectiveness.</p> <p>Candidates must discuss a renewable source of energy.</p> <p>Award 0 marks for non-renewable sources of energy.</p> <p>Award 2 marks for specific, appropriate named examples which further develop the answer.</p>	10	<p>Possible answers for all renewable energy sources might include</p> <ul style="list-style-type: none"> • infinite energy resources/sources of power that are sustainable (1 mark) • independent production of energy reducing the need for reliance on imports of fuel. (1 mark) <p>For wind power, other possible answers could include</p> <ul style="list-style-type: none"> • in countries with a windy climate and large areas of exposed upland (1 mark) for example The Eaglesham Moor (1 mark) • winds in Scotland can be strong enough to power the equivalent of all electricity needs for 1 day (1 mark) • where surplus is generated it can be sold for profit (1 mark) • wind energy may reduce energy bills (1 mark) • as power from onshore energy is now cheaper than electricity produced from any other source in the UK (1 mark) • wind power can be irregular and intermittent (1 mark) • during high pressure, for example, there can be periods of no winds or very low speeds (1 mark) leaving turbines motionless, producing no or very little power (1 mark). This may coincide with very cold periods in winter when demand is higher (1 mark) • currently wind energy cannot be stored (1 mark) • wind farms are usually found in rural locations far from areas of high demand. (1 mark) <p>Or any other valid point.</p>

Section 2 – Application of geographical skills

Question		General marking principle for this type of question	Max mark	Specific marking instructions for this question
5.	(a) and (b)	<p>Candidates should make reference to all sources, including the Ordnance Survey map, when discussing the suitability of the site and the social, economic and environmental impacts of the development on the surrounding area.</p> <p>Award 1 mark for each description of the site, or explanation of suitability of the site.</p> <p>Award 1 mark for each impact, and award a further mark where the candidate develops this.</p>	20	<p>Possible advantages of this location may include</p> <ul style="list-style-type: none"> • area chosen is flat (1 mark) and would help keep constructions costs down (1 mark) • the area chosen is also close to the M25 and the A4 (1 E mark) which makes it easier for construction lorries to access (1 mark) • the area chosen has good accessibility which means less access roads need to be built (1 mark) • its proximity to existing airport infrastructure will reduce cost (1 mark) • there is a lower density of land use to the north of existing site (1 mark) meaning less disruption than if the airport was to expand to the south or east. (1 mark) <p>Possible disadvantages</p> <ul style="list-style-type: none"> • the proposed runway will cross the M25 (1 mark) meaning a tunnel (or overpass) will have to be built (1 mark) • the River Colne (1 E mark) will also have to be diverted (1 mark) which may impact on surface run off (1 mark) • the Trading Estate at 034760 (1 E mark) may be disrupted by increased traffic, especially during construction phase (1 mark) • local residents in Harlington may also suffer from noise pollution during the construction phase (1 mark) • Longford 052768 (1 E mark)/parts of Harmondsworth will be demolished to make room for the new runway. (1 mark)

Question	General marking principle for this type of question	Max mark	Specific marking instructions for this question
	<p>Award 1 mark where candidates refer to the resource and award further marks where the candidate explains its suitability (beyond the wording of the resource).</p> <p>Award up to 4 marks for map evidence (E), which may include correct and appropriate grid references and/or place/road names.</p> <p>It is possible that some points referred to as a disadvantage will be interpreted by other candidates as a negative impact.</p> <p>Award marks for each point only once, where it is best explained.</p>		<p>Positive Impacts</p> <ul style="list-style-type: none"> • the creation of new rail infrastructure will help ease congestion on public transport in the area (1 mark) • construction jobs will be created (1 mark) in addition to service jobs in the new hotels and offices (1 mark) • the number of passengers is projected to rise to 100m by 2030 (1 mark) • the number of tourists visiting London will increase (1 mark) • as a result, this will further enhance income to the area (1 mark) • the cargo being transported is expected to rise to 2-3m tonnes by 2030 (1 mark) • the new runway will attract new businesses to the area. (1 mark) <p>Negative Impacts</p> <ul style="list-style-type: none"> • construction work and the various activities could be very damaging to the natural environment (1 mark) and could face strong opposition from conservationists (1 mark) • runoff during construction may contain pollutants, which could harm the water quality (1 mark) in the Wraysbury and/or King George VI reservoirs (1 E mark) • noise pollution from increased aircraft activity would upset local residents (1 mark) particularly late at night as the airport operates 24 hours (1 mark) • low flying aircraft along with increase noise pollution will decrease the house prices in the area (1 mark) • increased noise pollution from new flight paths will disrupt local wildlife (1 mark) at 010835 (1 E mark) • increase in buses may lead to higher levels of air pollution (1 mark) • road congestion in the surrounding areas will increase (1 mark) due to lorries and cars transporting freight and passengers (1 mark) • money will need to be made available to compensate householders forced to move. (1 mark) <p>Or any other valid point.</p>

[END OF MARKING INSTRUCTIONS]