Mark Scheme (Results)

Summer 2019

Pearson Edexcel International A Level
In Geography (WGE03) Paper 3

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

Summer 2019
Publications Code WGE03_01_1906_MS

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.

How to award marks when level descriptions are used

1. Finding the right level

The first stage is to decide into which level the answer should be placed in. To do this, use a 'best-fit' approach, deciding which level most closely describes the quality of the answer. Answers can display characteristics from more than one level, and where this happens markers must use the guidance below and their professional judgement to decide which level is most appropriate.

For example, one stronger passage at L4 would not by itself merit a L4 mark, but it might be evidence to support a high L3 mark, unless there are substantial weaknesses in other areas. Similarly, an answer that fits best in L3 but which has some characteristics of L2 might be placed at the bottom of L3. An answer displaying some characteristics of L3 and some of L1 might be placed in L2.

2. Finding a mark within a level

After a level has been decided on, the next stage is to decide on the mark within the level. The instructions below tell you how to reward responses within a level. However, where a level has specific guidance about how to place an answer within a level, always follow that guidance.

Levels containing 2 marks only

Start with the presumption that the work will be at the top of the level. Move down to the lower mark if the work only just meets the requirements of the level.

Levels containing 3 or more marks

Markers should be prepared to use the full range of marks available in a level and not restrict marks to the middle. Markers should start at the middle of the level (or the upper-middle mark if there is an even number of marks) and then move the mark up or down to find the best mark. To do this, they should take into account how far the answer meets the requirements of the level:

- If it meets the requirements *fully*, markers should be prepared to award full marks within the level. The top mark in the level is used for answers that are as good as can realistically be expected within that level
- If it only *barely* meets the requirements of the level, markers should consider awarding marks at the bottom of the level. The bottom mark in the level is used for answers that are the weakest that can be expected within that level
- The middle marks of the level are used for answers that have a *reasonable* match to the descriptor. This might represent a balance between some characteristics of the level that are fully met and others that are only barely met.

Question number **1(a)**	**Using Figure 1, explain the physical processes that cause the variations in rainfall between the three locations shown. (10)**

AO1 (4 marks)/AO2 (6 marks)

Marking instructions

Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below.

Responses that demonstrate **only** AO1 without any AO2 should be awarded marks as follows:

- Level 1 AO1 performance: 1 mark
- Level 2 AO1 performance: 2 or 3 marks
- Level 3 AO1 performance: 4 marks

Marking instructions

Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below.

Indicative content guidance

The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include:

AO1:

- Rainfall in Kisangani is the highest of the three locations, roughly 1500mm per year and the least seasonal: rain in every month /no dry season; evidence of a double peak in March and October
- Rainfall decreases moving north from the equator: roughly 500mm in N'Djamena and only 200m in Agadez.
- Rainfall becomes markedly more seasonal so Agadez only has 2 months with significant rainfall, whereas N'djamena has 4 months and Kisangani all months.
- Rainfall patterns / seasonality are related to high / low pressure areas and seasonal changes in these, related to global circulation.

AO2:

- Kisangani sits on the Equator so is permanently under the influence of the ITCZ and this low-pressure convergence (descending arms of the Hadley Cells) area generates year-round convectional rainfall: warm equatorial air rises, condenses, clouds form, precipitation.
- The ITCZ moves north and south seasonally, but never far enough from Kisangani to stop rainfall: its double peak is caused by this seasonal movement as the ITCZ crosses and re-crosses the geographical equator.
- In contrast Agadez is usually under the influence of sub-tropical high pressure meaning descending/ subsiding, warming air with no cloud formation and no precipitation.
- Seasonally, the ITCZ moves north during the northern hemisphere summer bringing low pressure of N'Djamena and a wet season lasting from June to September (West African Monsoon) before it moves back south.
- Agadez experiences a very short wet season at the extreme northern edge of the ICTZ's northern summer movement (this often fails, so no rainfall is common here) before high pressure returns; idea of a continental climate increasing aridity.
- Credit further explanation of seasonal ICTZ movements within the context of the global circulation model, Hadley and Ferrel Cells.
- Credit global warming and ENSO cycles as additional factors (as Figure 1 data could be for one year), but they are not the main reason for the differences.

Credit other acceptable explanations.		
Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–4**	• Demonstrates isolated or generic elements of geographical knowledge and understanding, some of which may be inaccurate or irrelevant. (AO1) • Applies knowledge and understanding to geographical information inconsistently. Connections/relationships between stimulus material and the question may be irrelevant. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce an interpretation with limited relevance and/or support. (AO2)
Level 2	**5-7**	• Demonstrates geographical knowledge and understanding, which is mostly relevant and may include some inaccuracies. (AO1) • Applies knowledge and understanding to geographical information to find some relevant connections/relationships between stimulus material and the question. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce a partial but coherent interpretation that is mostly relevant and supported by evidence. (AO2)
Level 3	**8-10**	• Demonstrates accurate and relevant geographical knowledge and understanding throughout. (AO1) • Applies knowledge and understanding to geographical information logically to find fully relevant connections/relationships between stimulus material and the question. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce a full and coherent interpretation that is relevant and supported by evidence. (AO2)

Question number **1(b)**	**Evaluate the contribution of aid as a response to weather disasters such as droughts and tropical cyclones. (15)**

AO1 (5 marks)/AO2 (10 marks)

Marking instructions

Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. Responses that demonstrate **only** AO1 without any AO2 should be awarded marks as follows:

- Level 1 AO1 performance: 1 mark
- Level 2 AO1 performance: 2 mark
- Level 3 AO1 performance: 3 or 4 marks
- Level 3 AO1 performance: 5 mark

Marking instructions

Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below.

Indicative content guidance

The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include:

AO1:

- Aid can be provided by local organisations, NGOs and local government as well as internationally via BINGOs, government and IGOs
- Aid can be in the form of personnel e.g. S&R teams, money, equipment and supplies
- It can be short-term i.e. Rescue and Relief, or longer term for reconstruction
- Aid is one part of a total response that also includes preparation, engineering, prediction and other responses.
- Weather disasters occur when there are human and / or economic losses above a given threshold.

AO2:

- Aid is often required in the developing world and developed world, but it may be different in scale and type i.e. food and water in low income places, versus a more organised aid response in pre-determined places e.g. hurricane evacuation centres in the USA
- Some form of aid is almost always needed, but it might arrive later in developing countries and involve international giving and NGOs; in developed countries it might be more government led and insurance might reduce the need for long-term aid – although Katrina is an example of long-term aid via FEMA and the American Red Cross and others.
- Strengths of aid include the ability to rescue people and keep people alive in the immediate aftermath of a disaster; feeding centres and refugee camps can be critical during African droughts and south Asian cyclones.
- It might be argued that the aid response to drought is often late e.g. the 1984-5 Ethiopian drought and famine and the 2005 Niger drought; despite early warnings the creeping nature of the drought hazard delayed aid response.
- Answers might argue that aid represents a failure of other more important responses such as preparation and prediction / evacuation; both increase resilience and if done effectively could reduce the need for aid e.g. preparing for tropical cyclones by warning and evacuation as well as flood defences and hazard resistant design
- A possible argument is that in developing countries the resources for preparation do not exist and therefore aid is more heavily relied upon; developed countries also provide aid for e.g. cyclone shelters in Bangladesh so aid can be long-term and can be directed at improving resilience.
- In terms of drought long-term water management solutions both high –tech and intermediate tech / NGO funded might be seen as more effective than emergency aid / relief.
- Long-term aid could include loans, which raises the wider issue of debt and dependency.
- Overall, stronger answers will make an assessment of different types of aid (short, long term) within a wider discussion of disaster response.

Credit other acceptable explanations.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–4**	• Demonstrates isolated elements of geographical knowledge and understanding, some of which may be inaccurate or irrelevant. (AO1) • Applies knowledge and understanding of geographical information/ideas, making limited and rarely logical connections/relationships, to produce an interpretation with limited relevance and/or support. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce an unsupported or generic conclusion, drawn from an argument that is unbalanced or lacks coherence. (AO2)
Level 2	**5-8**	• Demonstrates geographical knowledge and understanding, which is occasionally relevant and may include some inaccuracies. (AO1) • Applies knowledge and understanding of geographical information/ideas with limited but logical connections/relationships to produce a partial interpretation that is supported by some evidence but has limited coherence. (AO2) • Applies knowledge and understanding of geographical information/ideas to come to a conclusion, partially supported by an unbalanced argument with limited coherence. (AO2)
Level 3	**9-12**	• Demonstrates geographical knowledge and understanding, which is mostly relevant and may include some inaccuracies. (AO1) • Applies knowledge and understanding of geographical information/ideas logically, making some relevant connections/relationships. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce a partial but coherent interpretation that is mostly relevant and supported by evidence. (AO2)
Level 4	**13-15**	• Demonstrates accurate and relevant geographical knowledge and understanding throughout. (AO1) • Applies knowledge and understanding of geographical information/ideas logically, making relevant connections/relationships. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce a full and coherent interpretation that is relevant and supported by evidence. (AO2)

Question number **2**	**Using Figure 2, suggest reasons why there are conflicts between the different players shown. (10)**

AO1 (4 marks) /AO2 (6 marks)

Marking instructions

Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below.

Responses that demonstrate **only** AO1 without any AO2 should be awarded marks as follows:

- Level 1 AO1 performance: 1 mark
- Level 2 AO1 performance: 2 or 3 marks
- Level 3 AO1 performance: 4 marks

Marking instructions

Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below.

Indicative content guidance

The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include:

AO1:

- Conflicts are disagreements over policies, strategies and management between different stakeholders in conservation areas; Fig 2 suggests variations in severity / scale of conflict and how widespread it is.
- Illegal poachers conflict with almost all other groups and the conflicts are serious, although hunting tourism conflicts with many groups as well.
- Although not serious, local farmers and herders have conflict with many other groups.

AO2:

- Some players shown have totally exclusive aims; poachers killing animals for economic gain directly reduces species numbers which conservation areas aim to protect; local guides and safaris earn income from showing tourists these animals so conflict is inevitable.
- Conservation areas are protected by limiting some activities and / or access and include national parks, nature reserves, sustainable use zones and many other types; farmer and herders may feel access is being limited by NP managers i.e. conservation is prioritised over economic activities.
- Conservation aims to protect ecosystems and biodiversity, but also balance the needs of different users; Levels of conservation vary from total protection / no access to more mixed-use areas where conservation and economic development exist in parallel.
- There is evidence in Figure 2 of conflict over the same space e.g. safari and hunting tourism may use the same areas but have incompatible activities; this could also be true of farmer and tourists.
- Some answers could point out that without illegal poachers, conflicts would be relatively minor and management might be much easier.
- An ecosystem services approach could be taken i.e. conflict over provisioning services (goods) versus cultural and aesthetic value.

Credit other acceptable explanations.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–4**	• Demonstrates isolated or generic elements of geographical knowledge and understanding, some of which may be inaccurate or irrelevant. (AO1) • Applies knowledge and understanding to geographical information inconsistently. Connections/relationships between stimulus material and the question may be irrelevant. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce an interpretation with limited relevance and/or support. (AO2)
Level 2	**5-7**	• Demonstrates geographical knowledge and understanding, which is mostly relevant and may include some inaccuracies. (AO1) • Applies knowledge and understanding to geographical information to find some relevant connections/relationships between stimulus material and the question. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce a partial but coherent interpretation that is mostly relevant and supported by evidence. (AO2)
Level 3	**8-10**	• Demonstrates accurate and relevant geographical knowledge and understanding throughout. (AO1) • Applies knowledge and understanding to geographical information logically to find fully relevant connections/relationships between stimulus material and the question. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce a full and coherent interpretation that is relevant and supported by evidence. (AO2)

Question number **3**	**To what extent are global population trends the main threat to biodiversity? (15)**

AO1 (5 marks)/AO2 (10 marks)

Marking instructions

Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below.

Responses that demonstrate **only** AO1 without any AO2 should be awarded marks as follows:

- Level 1 AO1 performance: 1 mark
- Level 2 AO1 performance: 2 marks
- Level 3 AO1 performance: 3 or 4 marks
- Level 3 AO1 performance: 5 marks

Marking instructions

Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below.

Indicative content guidance

The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited.

Relevant points may include:

AO1:

- Global population is rising and is expected to continue to rise, although future total numbers are unclear: projections suggest 9 or 11 billion by 2100.
- Most population growth is expected in Asia (especially South Asia) and Africa, with slow growth or decline in some places (Europe, N Am, Japan, Russia).
- Biodiversity is the number of different species in a given area: it can be defined in species, genetic or ecosystem (niche) terms.
- Biodiversity is broadly declining, with extinction common and habitat destruction widespread – but this varies by location.
- There are numerous threats that could be considered: pollution, deforestation, climate change, alien species and others.

AO2:

- Population growth translates to increasing resource demands such as food and energy, which could be seen as largely responsible for converting ecosystems into farms and mines – leading to biodiversity loss.
- The question of numbers of people, compared to their affluence / wealth might be considered i.e. is it more that wealthier people demand more resources so wealth rather than numbers is the key driver.
- This could be related to globalisation and trends in a global consumer culture / growth of the middle class: perhaps this is the main threat rather than pure numbers of people i.e. a combination of affluence, wasteful consumption and pollution from waste.
- Certain resources, such as demand for urban land, demand for timber and fuelwood, demand for minerals can be related to population growth.
- Some might argue the most significant threat is global warming leading to widespread extinction, biome shifts and collapses: this can be related to population growth but fossil fuel consumption (CO_2 emissions) might be seen as the key driver: methane emissions might be seen as more closely linked to population numbers through the expansion of farming.
- Stronger answers should recognise that in developed regions, slow or no population growth means other threats are likely to be more significant, or wealth / environmental concerns means biodiversity may actually be protected (Kuznets's curve concept).
- Some might argue that in slow / no growth developed countries conservation / protection is now widespread and this might become the 'norm' in the future in today's developing and emerging countries; it could be argued population will plateau eventually.
- Stronger answers will make an overall judgement about population growth as a threat compared to other threats; very good answers may consider spatial differences; strong answers will recognise the inter-relationship between threats e.g. population, affluence, climate change.

Credit other acceptable explanations.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–4**	• Demonstrates isolated elements of geographical knowledge and understanding, some of which may be inaccurate or irrelevant. (AO1) • Applies knowledge and understanding of geographical information/ideas, making limited and rarely logical connections/relationships, to produce an interpretation with limited relevance and/or support. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce an unsupported or generic conclusion, drawn from an argument that is unbalanced or lacks coherence. (AO2)
Level 2	**5-8**	• Demonstrates geographical knowledge and understanding, which is occasionally relevant and may include some inaccuracies. (AO1) • Applies knowledge and understanding of geographical information/ideas with limited but logical connections/relationships to produce a partial interpretation that is supported by some evidence but has limited coherence. (AO2) • Applies knowledge and understanding of geographical information/ideas to come to a conclusion, partially supported by an unbalanced argument with limited coherence. (AO2)
Level 3	**9-12**	• Demonstrates geographical knowledge and understanding, which is mostly relevant and may include some inaccuracies. (AO1) • Applies knowledge and understanding of geographical information/ideas logically, making some relevant connections/relationships. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce a partial but coherent interpretation that is mostly relevant and supported by evidence. (AO2)
Level 4	**13-15**	• Demonstrates accurate and relevant geographical knowledge and understanding throughout. (AO1) • Applies knowledge and understanding of geographical information/ideas logically, making relevant connections/relationships. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce a full and coherent interpretation that is relevant and supported by evidence. (AO2)

Question Number **4(a)**	**Using Figure 3, suggest reasons for the trends in global biofuel production shown. (5)**	Mark
AO1 (2 marks)/AO2 (3 marks) Award **1** mark (AO1) for each relevant point and further expansion marks for reasons/explanations linked to the data shown (AO2), up to a maximum of 5 marks. • Very rapid growth post the early 2000s might be seen as developing a 'sustainable' / 'renewable' energy source (1) in response to concerns over fossil fuel emissions (1). • Growth has accelerated since 2000 perhaps as a response to tightening supply of fossil fuels (1) so oil prices increased making biofuels competitive (1). • Most recent post-2014 growth has been slower perhaps because previous pace of growth raised environmental concerns (1) such as biofuels being responsible for deforestation/ widespread forest fires (1) or a return to lower oil prices reducing the incentive to produce more biofuel (1). • Credit the idea that growth might be related to the development of technology / engine technology (1) which might not have existed pre 2000 (1). Credit other acceptable explanations.		**(5)**

Question number **4(b)**	**Using named examples, assess the economic and environmental impacts of exploiting unconventional fossil fuels. (15)**

AO1 (5 marks)/AO2 (10 marks)

Marking instructions

Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below.

Responses that demonstrate **only** AO1 without any AO2 should be awarded marks as follows:

- Level 1 AO1 performance: 1 mark
- Level 2 AO1 performance: 2 marks
- Level 3 AO1 performance: 3 or 4 marks
- Level 3 AO1 performance: 5 marks

Marking instructions

Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below.

Indicative content guidance

The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include:

AO1:

- Unconventional fossil fuels include shale gas and oil (fracking), tar sands, heavy oil and enhanced recovery, deep water oil (technically challenging).
- These resources have been exploited for some time, but not extensively largely due to costs and technology constraints.
- Environmental impacts, especially groundwater storage, can be local and consist of landscape scarring, water pollution impacts, ecosystem losses.
- There are also global impacts including higher carbon dioxide emissions and contribution to global warming.
- Economic impacts could be positive, especially at a local scale i.e. jobs, economic development.

AO2:

- There is an economic argument for exploiting unconventional fossil fuels in terms of prolonging fossil fuel production, keeping oil and gas prices relatively low; economic growth and jobs e.g. in Alberta Canada can be significant.
- In some cases, techniques such as fracking have increased energy security e.g. in the USA, especially in terms of gas and oil; reducing foreign dependency and keeping prices low – benefits to industry and employment.
- Long-term greater dependency on unconventional sources could lead to price rises as the costs of extraction are much higher than for conventional sources e.g. oil shale and tar sands (not economic below a certain oil price raising boom / buts economic issues) ; it could be argued a transition to renewable energy would be economically and environmentally beneficial long-term.
- Locally, environmental impacts ae almost always negative and in some cases severely so e.g. the Canadian tar sands blamed for water pollution, localised high emissions and acid rain, high energy consumption during extraction / processing; examples include the 2010 BP Deep Water Horizon Spill and ecological issues in Alaska / Arctic.
- Fracking has been accused of causing pollution to aquifers and of having environmental health impacts; it may be the risks of oi spills and accidents are higher when new technology is being used in potentially harsh environments. Shale gas could be seen as 'greener' than the coal it often replaces as an energy source.
- Carbon emissions are likely to be higher with unconventional fossil fuels because of the energy used during extraction and processing e.g. oil shales from the Green River would require a large amount of energy during production, and produce toxic waste products.
- Overall, the judgement is likely to be whether the economic impacts – which are in many cases positive, outweigh the almost universal negative environmental impacts; very good answers might argue for a renewable energy approach, or perhaps suggest that in the future better technology might reduce the environmental costs of using unconventional sources.

NB the main focus should be on unconventional fossil fuels, but conventional fossil fuels and other energy sources might be considered as part of the overall assessment. A single case study will be self-penalising.
Credit other acceptable explanations.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–4**	• Demonstrates isolated elements of geographical knowledge and understanding, some of which may be inaccurate or irrelevant. (AO1) • Applies knowledge and understanding of geographical information/ideas, making limited and rarely logical connections/relationships, to produce an interpretation with limited relevance and/or support. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce an unsupported or generic conclusion, drawn from an argument that is unbalanced or lacks coherence. (AO2)
Level 2	**5-8**	• Demonstrates geographical knowledge and understanding, which is occasionally relevant and may include some inaccuracies. (AO1) • Applies knowledge and understanding of geographical

		information/ideas with limited but logical connections/relationships to produce a partial interpretation that is supported by some evidence but has limited coherence. (AO2) • Applies knowledge and understanding of geographical information/ideas to come to a conclusion, partially supported by an unbalanced argument with limited coherence. (AO2)
Level 3	**9-12**	• Demonstrates geographical knowledge and understanding, which is mostly relevant and may include some inaccuracies. (AO1) • Applies knowledge and understanding of geographical information/ideas logically, making some relevant connections/relationships. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce a partial but coherent interpretation that is mostly relevant and supported by evidence. (AO2)
Level 4	**13-15**	• Demonstrates accurate and relevant geographical knowledge and understanding throughout. (AO1) • Applies knowledge and understanding of geographical information/ideas logically, making relevant connections/relationships. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce a full and coherent interpretation that is relevant and supported by evidence. (AO2)

Question Number **5(a)**	**Using Figure 4, suggest reasons for the trends in global desalination capacity shown. (5)**	Mark
	AO1 (2 marks)/AO2 (3 marks) Award **1** mark (AO1) for each relevant point and further expansion marks for reasons/explanations linked to the data shown (AO2), up to a maximum of 5 marks. • Very slow growth up to 1980 because costs were very high (1) and only locations with severe water supply problems invested in the technology (1). • Overall growth has gradually quickened as demand for water has grown worldwide (1) so more locations have needed to adopt desalination to secure freshwater supply (1), plus costs are likely to have fallen so adoption is more widespread (1). • Since 2000, growth has accelerated perhaps in response to rising demand in emerging economies / middle east (1) locations with low rainfall / lack of rivers / lakes / aquifers (1) which have seen increases in population / industry so demand has to be met (1). • Some evidence of post 2010 slower growth perhaps as a result of environmental concerns (1) such as high emissions of CO2 from fossil fuel power sources / difficulties of dealing with salt by-product (1). Credit other acceptable explanations.	**(5)**

Question number **5(b)**	**Using named examples, assess the impact of water insecurity on human health and economic development. (15)**

AO1 (5 marks)/AO2 (10 marks)

Marking instructions

Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below.

Responses that demonstrate **only** AO1 without any AO2 should be awarded marks as follows:

- Level 1 AO1 performance: 1 mark
- Level 2 AO1 performance: 2 marks
- Level 3 AO1 performance: 3 or 4 marks
- Level 3 AO1 performance: 5 marks

Marking instructions

Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below.

Indicative content guidance

The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include:

AO1:

- Water is key to human health, and water stress or scarcity can lead to illness, shortened life expectancy and therefore lower capacity to work.
- Health impacts include water-borne diseases, which affect some groups (young, elderly) more than others.
- Water required for economic development due to industrial use and use in energy production (HEP, cooling water)
- Access to water can be measured by renewable water availability per capita; it can also be a function of cost: economic water scarcity.

AO2:

- Economic development can be severely hindered by lack of water supply; evidence includes lack of development in Sahelian countries and increased water scarcity causing agricultural stress in locations such as the Punjab; on the other hand places like the Sahel often have conflict, governance and other hindrances so water may not be the key factor.
- The huge efforts made in China (Three Gorges, South-North Transfer) and the USA (California / Colorado water systems) to attain a water supply might be seen as evidence of the importance of water in development; this is also the case with desalination in the Middle East e.g. UAE; however water is not needed for food production here as these regions import it (virtual water).
- The case of Australia and its Millennium Drought might be used to show that even developed countries can face problems when water supply tightens: Australia invested in desalination and new water management systems in order to ensure supply for farming, people and households.
- It might be argued that water systems and technology can actually provide almost any location with water required for economic development.
- Impacts on human health of a poor, polluted, unreliable and expensive water supply in terms of disease, high infant mortality and lower life expectancy – many developing SSA and South Asian suffer these issues; water supply is a key issue.

- Stronger answers should recognise the link between human health and economic development i.e. that high disease burden and time spent obtaining water / costs of water can restrict development progress.
- Overall, it might be argued that money and technology can overcome a poor water supply and therefore it is not a barrier to economic development, but more so in some countries than others; health impacts can be serious and can directly impinge on development.

Credit other acceptable explanations.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–4**	• Demonstrates isolated elements of geographical knowledge and understanding, some of which may be inaccurate or irrelevant. (AO1) • Applies knowledge and understanding of geographical information/ideas, making limited and rarely logical connections/relationships, to produce an interpretation with limited relevance and/or support. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce an unsupported or generic conclusion, drawn from an argument that is unbalanced or lacks coherence. (AO2)
Level 2	**5-8**	• Demonstrates geographical knowledge and understanding, which is occasionally relevant and may include some inaccuracies. (AO1) • Applies knowledge and understanding of geographical information/ideas with limited but logical connections/relationships to produce a partial interpretation that is supported by some evidence but has limited coherence. (AO2) • Applies knowledge and understanding of geographical information/ideas to come to a conclusion, partially supported by an unbalanced argument with limited coherence. (AO2)
Level 3	**9-12**	• Demonstrates geographical knowledge and understanding, which is mostly relevant and may include some inaccuracies. (AO1) • Applies knowledge and understanding of geographical information/ideas logically, making some relevant connections/relationships. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce a partial but coherent interpretation that is mostly relevant and supported by evidence. (AO2)
Level 4	**13-15**	• Demonstrates accurate and relevant geographical knowledge and understanding throughout. (AO1) • Applies knowledge and understanding of geographical information/ideas logically, making relevant connections/relationships. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce a full and coherent interpretation that is relevant and supported by evidence. (AO2)

Question number **6**	**To what extent have economic challenges weakened the superpower status of the USA and EU? (20)**

AO1 (5 marks)/AO2 (15 marks)

Marking instructions

Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below.

Responses that demonstrate **only** AO1 without any AO2 should be awarded marks as follows:

- Level 1 AO1 performance: 1 mark
- Level 2 AO1 performance: 2 marks
- Level 3 AO1 performance: 3 marks
- Level 4 AO1 performance: 4–5 marks

Indicative content guidance

The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include:

AO1:

- The EU and USA are both highly developed, but their superpower status is not identical as the EU is a multi-state power; the USA might be considered a hyperpower
- Superpower status stems from political, economic, demographic, cultural and other sources.
- Economic challenges include ageing populations, deindustrialisation / economic restructuring, high debt levels
- Political challenges include their role in areas of tension such as the Middle East, as well as dealing with emerging powers especially the rise of China – these could be seem as having an economic cost.
- Internal economic challenges might also be included e.g. anti-globalisation, Brexit, economic nationalism / protectionism.

AO2:

- The EU and USA have ageing populations with high social care and health care costs; these represent an economic challenge now and in the future in terms of paying for an elderly population; however, China also faces these challenges
- Debt levels are high especially as a result of the 2007-08 recession and this is a drag on the economies of the EU and USA i.e. high debt interest payments; in some cases, debt levels continue to rise.
- Deindustrialisation and the loss of secondary jobs has created high regeneration costs in the USA and EU, led to locally high unemployment and fed political discontent e.g. President Trump, the UK EU exit: this can be contrasted with the economic challenge from the rapid rise of BRIC and other economies, especially China and its role in global trade.
- For the USA the cost of being the 'world's policeman' is very high, however the USA continues to have 'hyperpower' military capacity beyond that of any other country, so it could be argued that economic and political challenges have yet to affect this 'pillar' of power.
- The USA and some EU countries (UK, France) are still the most culturally influential in the world and this looks unlikely to change in terms of food, media, news and its associated ideology.

- There is space to consider the strengths and weaknesses of emerging powers e.g. a country like India might be seen as little threat even to a 'challenged' EU and USA because of its high poverty, lack of infrastructure, water supply issues etc.
- The USA might be seen as being challenged by China in terms of global environmental leadership (COP21) and in some geographical spheres such as SE Asia / South and East China sea – all straining its global hegemony; the EU and USA have both spent heavily on the 'war on terror' and conflicts in the Middle East which China has largely avoided; recent 'trade wars' and trade difficulties e.g. with China / USA, NAFTA renegotiation are relevant.
- Strong answers should consider different 'pillars' either directly or indirectly, to make an assessment of the extent to which these have been / will be weakened by the challenges the EU or USA face (which may be considered different); this should be within the context of the emerging powers.

Credit other acceptable explanations.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–5**	• Demonstrates isolated elements of geographical knowledge and understanding, some of which may be inaccurate or irrelevant. (AO1) • Applies knowledge and understanding of geographical ideas, making limited and rarely logical connections/relationships. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce an interpretation with limited coherence and support from evidence. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce an unsupported or generic conclusion, drawn from an argument that is unbalanced or lacks coherence. (AO2)
Level 2	**6-10**	• Demonstrates geographical knowledge and understanding, which is occasionally relevant and may include some inaccuracies. (AO1) • Applies knowledge and understanding of geographical information/ideas with limited but logical connections/relationships. (AO2) • Applies knowledge and understanding of geographical ideas in order to produce a partial interpretation that is supported by some evidence but has limited coherence. (AO2) • Applies knowledge and understanding of geographical information/ideas to come to a conclusion, partially supported by an unbalanced argument with limited coherence. (AO2)
Level 3	**11-15**	• Demonstrates geographical knowledge and understanding, which is mostly relevant and accurate. (AO1) • Applies knowledge and understanding of geographical information/ideas to find some logical and relevant connections/relationships. (AO2) • Applies knowledge and understanding of geographical ideas in order to produce a partial but coherent interpretation that is supported by some evidence. (AO2) • Applies knowledge and understanding of geographical information/ideas to come to a conclusion, largely supported by an argument that may be unbalanced or partially coherent. (AO2)
Level 4	**16-20**	• Demonstrates accurate and relevant geographical knowledge and understanding throughout. (AO1) • Applies knowledge and understanding of geographical information/ideas to find fully logical and relevant connections/relationships. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce a full and coherent interpretation that is supported by evidence. (AO2)

		• Applies knowledge and understanding of geographical information/ideas to come to a rational, substantiated conclusion, fully supported by a balanced argument that is drawn together coherently. (AO2)

Question number **7**	**To what extent has rapid economic development in emerging countries benefited both people and the environment? (20)**

AO1 (5 marks)/AO2 (15 marks)
Marking instructions

Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below.

Responses that demonstrate **only** AO1 without any AO2 should be awarded marks as follows:

- Level 1 AO1 performance: 1 mark
- Level 2 AO1 performance: 2 marks
- Level 3 AO1 performance: 3 marks
- Level 4 AO1 performance: 4–5 marks

Indicative content guidance

The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include:

AO1:

- NICs / emerging countries (India, China, Brazil and others) have seen annual economic growth rates of 5-10% since the 1990s
- Average incomes have risen sharply; poverty still persists in rural areas / among some groups and inequality may have risen.
- Many NICs have grown because of industrialisation / modernisation (Rostow) and a shift towards the secondary sector altering employment patterns
- Growth in incomes and jobs has in some cases be accompanied by increased exploitation e.g. sweatshops.
- Environmental issues include water pollution, urban air pollution, deforestation and others.

AO2:

- A key argument is likely to be that industrialisation / modernisation through globalisation and FDI – encouraged by government polices e.g. China's Open Door policy – has created many jobs, increased incomes, and people are better off than they were – perhaps especially rural-urban migrants
- This process has affected urban areas more than others, so it could be argued rural areas and perhaps slum areas in cities have benefitted much less; countries further along the development process such as South Korea have almost reached developed country levels of human development. Rising inequality might be considered a major cost in some emerging countries.
- On the other hand, some industrialisation has come with a human cost such as exploited workers, low pay, hazardous working conditions in sweatshops and other social issues: again, the extent of this 'negative' depends on the perspective offered.
- Environmental issues is some NICs are severe e.g. Chinese water pollution, air quality in Indian and Chinese cities, loss of biodiversity from Indonesia's tropical forests; these take a severe toll on human health as well as ecosystems.
- However, it could be argued that this is both inevitable and also temporary – as

countries develop further they are likely to begin to tackle environmental issues as has happened in developed countries i.e. the environmental Kuznet's Curve idea

- The MDGs / SDGs could be mentioned as a strategy to try and improve the conditions of people who have not benefitted from development by industrialisation / modernisation.
- In stronger answers there should be an overall judgement that considers the extent to which rapid economic development has had costs or benefits, and some consideration of people versus the environment in terms of costs v benefits.
- Different emerging countries i.e. ones further down the development pathway might be considered as having different costs / benefits to ones that have only recently emerged.

Credit other acceptable explanations.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–5**	• Demonstrates isolated elements of geographical knowledge and understanding, some of which may be inaccurate or irrelevant. (AO1) • Applies knowledge and understanding of geographical ideas, making limited and rarely logical connections/relationships. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce an interpretation with limited coherence and support from evidence. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce an unsupported or generic conclusion, drawn from an argument that is unbalanced or lacks coherence. (AO2)
Level 2	**6-10**	• Demonstrates geographical knowledge and understanding, which is occasionally relevant and may include some inaccuracies. (AO1) • Applies knowledge and understanding of geographical information/ideas with limited but logical connections/relationships. (AO2) • Applies knowledge and understanding of geographical ideas in order to produce a partial interpretation that is supported by some evidence but has limited coherence. (AO2) • Applies knowledge and understanding of geographical information/ideas to come to a conclusion, partially supported by an unbalanced argument with limited coherence. (AO2)
Level 3	**11-15**	• Demonstrates geographical knowledge and understanding, which is mostly relevant and accurate. (AO1) • Applies knowledge and understanding of geographical information/ideas to find some logical and relevant connections/relationships. (AO2) • Applies knowledge and understanding of geographical ideas in order to produce a partial but coherent interpretation that is supported by some evidence. (AO2) • Applies knowledge and understanding of geographical information/ideas to come to a conclusion, largely supported by an argument that may be unbalanced or partially coherent. (AO2)

Level 4	**16-20**	• Demonstrates accurate and relevant geographical knowledge and understanding throughout. (AO1) • Applies knowledge and understanding of geographical information/ideas to find fully logical and relevant connections/relationships. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce a full and coherent interpretation that is supported by evidence. (AO2) • Applies knowledge and understanding of geographical information/ideas to come to a rational, substantiated conclusion, fully supported by a balanced argument that is drawn together coherently. (AO2)

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