Mark Scheme (Results)

November 2021

Pearson Edexcel GCSE A in

Geography (1GA0)

Paper 02- The Human Environment

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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.

Question 1 – Changing cities

Question number	Answer	Mark
1(a)	Increase in the percentage / number / proportion of people living in towns / cities. **Accept any other appropriate response.**	**(1)**

Question number	Answer	Mark
1(b) (i)	B 369 million <u>Incorrect responses:</u> Options A, C and D are not the correct calculation of 472-103.	**(1)**

Question number	Answer	Mark
1(b)(ii)	Working to show: Division of total urban population by % urban: 472 / 40 = 11.8 (1) Multiplication of the answer from step 1 by 100: 11.8 x 100 = 1,180 (1) Maximum of one mark if no appropriate working out is shown.	**(2)**

Question number	Answer	Mark
1(b) (iii)	Award 1 mark for the identification of an appropriate graph (1) and a further 1 mark for description of how this graph would be constructed to represent the data shown on Figure 1a (1). A histogram / bar chart could be used (1) with 'years' along the x-axis and a line/bar drawn to shown the changes in percentage population data (1). A pictogram could be used (1) for example with a 'whole person' representing 10% urban (1). A pie chart could be used (1) with one being drawn for each year showing the % urban vs % rural each time (1). **Accept any other appropriate response**	**(2)**

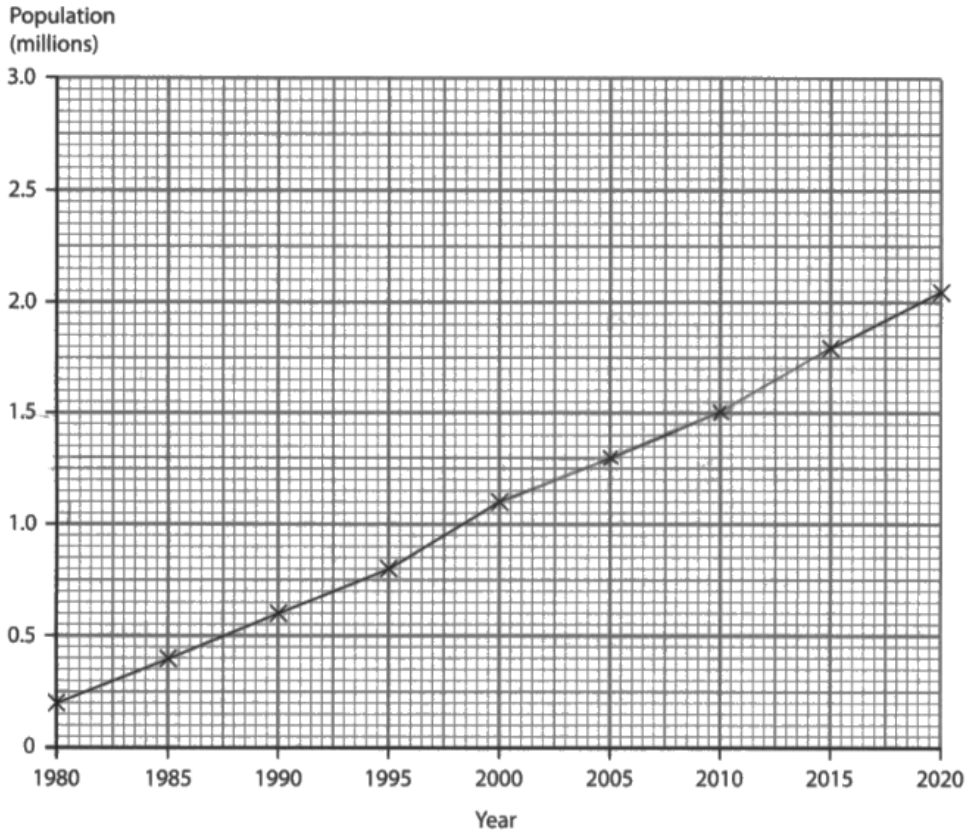
Question number	Answer	Mark
1(b) (iv)	Award 1 mark for a reason why urbanisation may have occurred in Africa, and 1 mark for further explanation, up to a maximum of 2 marks each. Industrialisation could have taken place in many African countries since 1975 (1) which has to a growing need for additional labour in urban areas (1). Many countries in Africa may be having an increase in rural to urban migration than others (1) example of push / pull factor (1). African countries might be are experiencing falling death rates (1) because of improvements in health care / education / sanitation (1). High population growth in rural areas is not matched by work opportunities (1) so young adults move to urban areas (1). Climate change is causing people to abandon farming (1) and move to urban areas (1). High birth rates in cities (1) due to lack of available family planning (1). **Accept any other appropriate response**	**(4)**

Question number	Answer	Mark
1(c)	Award 1 mark for identifying a locational factor (1) and a further one mark for an explanation of why this factor is important (1). Will depend on named major UK city, but typical responses may include: The original site of Bristol was at the confluence of two rivers (1) which provided trade links with other parts of the country (1). The site of Birmingham was at a bridging point (1) which provided good access for people located on both sides of the River Rea (1). The situation of Birmingham relative to natural resources (1) led to the growth of its industries (1). The site of Leeds was on flat land to the south of the river (Aire) (1) which mean that it was easy to build houses on (1). Along the banks of a river (1) which provided good transport access for London along the River Thames (1) The situation of London relative to the other countries/mainland Europe (1) which provided good trade links (1) Maximum of one mark for a generic response, with no-place-specific detail. **Accept any other appropriate response.**	**(2)**

Question number	Answer	Mark
1(d)	A England Incorrect responses: Options B, C and D all have a smaller urban population than option A (England).	**(1)**

Question number	Answer	Mark
1(e)	Award 1 mark for any of the following, up to maximum of 2 marks: Graffiti on the building (1) Area around the building is overgrown (1) Piles of rubble around the building (1) Building itself looks derelict / smashed windows (1) No evidence of any workers / activity from the building (e.g. smoke from chimney) (1) **Accept any other appropriate response**	**(2)**

Question number	Answer	Mark
1(f)	Award 1 mark for a reason for deindustrialisation (1), and 1 mark for further explanation about why this leads to industry closing down in UK cities (1). Increased globalisation (1) which means that cheaper imports are entering the UK from other countries (1). Increased decentralisation / incentives to locate away from inner-city areas (1) which meant that factories were demolished / closed down / moved away from the city (1). Development of new technologies (1) which meant that some factories had out of date machinery / could not keep up with those factories that had newer machinery / could produce good cheaper (1). Improved transport infrastructure (1) which means that goods can be moved around the world more easily (1). Cheaper labour / production costs abroad (1) which means that firms re-locate overseas so they can make higher profits / produce cheaper goods (1). Shifts in consumer demand (1) which means that the goods manufactured by a factory are no longer sold – so the factory goes out of business (1). **Accept any other appropriate response**	**(2)**

Question number	Answer	Mark
1(g)(i)	One mark for each correct plot. For 2 marks, the plots need to be joined up correctly. Max 1 mark for two correct plots, but no line drawn that joins them up.  	**(2)**

Question number	Answer	Mark
1(g) (ii)	Award 1 mark for identifying a possible effect of a rising population (1), and a further one mark for explanation of the effect, up to a maximum of 3 marks. Water supply problems for people living in Phnom Penh (1) because the demand for water from the rising population exceeds supply (1) which means that people may become dehydrated / resort to drinking polluted water (1). Housing problems / growth of squatter settlements (1) as many of the in-migrants can afford a proper house in the city (1) which means they end up living in poor conditions / houses that lack electricity etc. (1). Increased traffic congestion / air pollution from vehicles (1) which can impact on the journey times / health of the inhabitants (1) which means that the local economy suffers / life expectancy decreases (1). Greater competition for jobs (1) which means that there are problems of under-employment / unemployment (1) which reduces the income / standard of living of local residents (1). Problems with waste disposal / pollution (1) because the infrastructure of Phnom Penh lags behind the rate of population growth (1) which means that piles of rubbish might mount up on the streets which is a health hazard (1). **Accept any other appropriate response.**	**(3)**

Question number	Indicative content
1(h)	**AO2 (4 marks)/AO3 (4 marks)** **AO2** • Migration is about the movement of people from place to place. • People migrate for many different reasons. These reasons can be classified as economic (moving to find work or follow a particular career path), social (moving somewhere for a better quality of life or to be closer to family or friends), political (moving to escape political persecution or war) or environmental (causes of migration include natural disasters such as flooding). • Push factors are the reasons why people leave an area. • Push factors include a lack of services, high crime, deindustrialisation and unemployment • Pull factors are the reasons why people move to a particular area. • Pull factors include higher employment, more wealth, better services, better climate (e.g. for retirement), safer, less crime and to be near friends and family, • Many refugees / asylum seekers have migrated to the UK. A refugee is someone who has left their home and does not have a new home to go to. Often refugees do not have a clear idea of where they may finally settle. **AO3** • The nature and relative importance of the reasons why people migrate is influence by a cities level of development relative to other parts of the UK. • Some of the reasons for migration are connected; for example, some people choose to migrate to UK city to enhance their career opportunities – and ultimately experience a better quality of life and standard of living. • Migration usually happens as a result of a *combination* of push and pull factors. • Another significant factor is the influence upon the type of migrant coming to major city is linked to political agreements that the host country has with other countries – for example freedom of movement from (former) member states of the EU. • Government policy can also be an important factor in terms of attracting or deterring migrants from coming to a city/country. For example, after WW2 (until the 1970's), the UK government actively encouraged migrants from Commonwealth countries to come to the UK to provide labour for textile factories, transport, health or steelworks – and these migrants tended to settle in certain cities. The UK tightened migration controls in the 1970s.

Level	Mark	Descriptor
	0	No acceptable response.
Level 1	1–3	• Demonstrates isolated elements of understanding of concepts and the interrelationship of 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 that are supported by limited evidence. (AO3)
Level 2	4–6	• Demonstrates elements of understanding of concepts and the interrelationship of places, environments and processes. (AO2) • Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3)
Level 3	7–8	• Demonstrates accurate understanding of concepts and the interrelationship of 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 2 – Global development

Question number	Answer	Mark
2(a)(i)	D Spain <u>Incorrect responses:</u> Spain (option D) had a life expectancy of 83 in 2016, which is higher than: A Bulgaria (75) B USA (79) C Albania (78)	**(1)**

Question number	Answer	Mark
2(a) (ii)	B Chad <u>Incorrect responses:</u> Afghanistan (option B) had a life expectancy of 32 in 1960, which is lower than: A Senegal (38) C India (41) D Kuwait (60)	**(1)**

Question number	Answer	Mark
2(a)(iii)	Award 1 mark for identification of overall pattern, and a further 1 mark for extension through description, up to a maximum of 2 marks. Overall pattern – life expectancy has increased (1) with use of supporting data e.g. from 60 to 75 years / by 15 years (1). Life expectancy has gone up (1) not as much as India's (1)	**(2)**

Question number	Answer	Mark
2(a)(iv)	Working to show: Subtraction of 69 (new number) - 41 (old number) = 28 (1) Division of 28 by 41 x 100 = 68.3 (1) Maximum of 1 mark if the correct answer is given without any working show. Maximum of 1 mark if the working is shown, but the answer is not written to one decimal place.	**(2)**

Question number	Answer	Mark
2(a)(v)	Award 1 mark for identifying a reason why life expectancy is increasing in some developing and emerging countries (1), and a further one mark for development through explanation of why this factor affects life expectancy, up to a maximum of 2 marks each. Free/better health care is now available (1) which means that more people are vaccinated against life-threatening diseases (1). Improved medical technology (1) which means that diseases such as cancer / Alzheimer's can be treated more effectively (1). A decrease in manual employment (1) has meant that fewer people are employed in dangerous jobs (such as coal mining and steel making) (1). Increased wealth (1) means that people have improved/cleaner/more hygienic living conditions /healthier diets (1). There is a greater awareness of healthy living (1) which means that people are exercising more / smoking less (1). Improved education systems (1) means that more people know about the risks of drinking dirty water / hygiene / transmission of diseases (1). Reduced family size (1) means better standard of living/healthier diets / access to education / access to healthcare (1) **Accept any other appropriate response.**	**(4)**

Question number	Answer	Mark
2(b)(i)	B Life expectancy is higher in Denmark than in Egypt D Gross national income per capita will be lowest in Cameroon <u>Incorrect responses:</u> A is incorrect because Denmark is likely to have the highest mean years of schooling C is incorrect because Denmark has a higher HDI value than Cameroon E is incorrect because Denmark has a higher HDI value than Cameroon	**(2)**

Question number	Answer	Mark
2(b) (ii)	Award 1 mark for identifying another factor that contributes to the human development of a country (1) and a second mark for further description, up to a maximum of 2 marks. Collect data daily calorie intake per person (1) will provide information about food security (1). Information about access to clean drinking water (1) will give some indication about water security (1). Data about access to high-speed broadband per 1000 people (1) will provide information about how technologically-advance a country is (1). **Accept any other appropriate response**	**(2)**

Question number	Answer	Mark
2(c) (i)	Answers will depend on the chosen case study. Characteristics must be place-specific; no credit for a generic idea. e.g. Location within the appropriate continent of this country (1) Details of named neighbouring countries (1) Proximity to key named physical features e.g. oceans / mountains (1) **Accept any other appropriate response**	**(2)**

Question number	Answer	Mark
2(c) (ii)	Award 1 mark for identifying a negative impact of rapid development on the environment (1) and a further one mark for development through explanation of a consequence of this impact, up to a maximum of 2 marks. Answers will depend on the chosen case study. Water supplies become polluted by industrial waste / mining (1) which means that the biodiversity in rivers declines (1). Air is polluted by the growing number of cars (1) which means that life expectancy declines (1). Greenhouse gas / CO_2 emissions increase due to the growth in the number of factories (1) which means that global warming is likely to increase (1). Many trees are cut down to make room for new factories (1) which means that habitats are lost / biodiversity decreases (1). **Accept any other appropriate response.**	**(2)**

Question number	Answer	Mark
2(c) (iii)	Answers will depend on the chosen case study. NB: Private investment is *not* investment from the government – but investment from companies / organisations (including TNCs) – often referred to 'foreign direct investment' (FDI). Award 1 mark for identifying an example of private investment, and further one mark for development through explanation of how this has had an impact on the named country's level of development, up to a maximum of 2 marks each. The government has encouraged FDI / incentives to TNCs to locate in this country (1) as these companies create job opportunities for local people (1). The government has encouraged foreign-owned commercial banks to locate in this country (1) which stimulates development by keeping interest rates down (1). The government has encouraged investment from TNCs to develop the country's infrastructure (1) which in turn will attract more FDI, boosting the economy (1). **Accept any other appropriate response.**	**(4)**

Question number	Indicative content
2(d)	**AO2 (4 marks)/AO3 (4 marks)** **AO2** • Aid can help increase the level of development for countries by paying for imports, providing capital to invest in industry / infrastructure and tackling skills shortages needed for the level of development to increase. • International aid can provide vital income for many developing / emerging countries. There are three main systems through which international aid can be supplied: • Bilateral aid - aid given directly by the government of one country to another. • Multilateral aid - aid given by governments to international organisations which use the money to assist programmes in poorer countries e.g. the World Bank and UNESCO. • Non-governmental organisations (NGOs) – these distribute aid in a variety of ways. Many of them are charities (e.g. Oxfam and WaterAid) which raise money for development projects, ensuring aid is directed at the people who need it most. Aid can be distributed in several ways to increase the level of development of a country: • Short-term aid – given in response to a sudden problem e.g. an earthquake, hurricane or tsunami. • Longer-term development projects – e.g. investment into education or medical facilities. • Top-down aid projects – managed by a large organisation or the government e.g. building a dam to provide water supply and HEP. • Bottom-up aid projects – often funded by NGOs – working with local communities. **AO3** Evaluation will depend on specific case studies, but may include: • There are many advantages of aid, for example short-term aid can save lives, whilst longer term aid can help rebuild livelihoods and infrastucture following a natural disaster. • Longer-term development projects such as those aiming to improve farming can stimulate development as these improve the food supply for the people – but also can provides a means of trading with other countries, reducing reliance on aid. • Other aid projetcs, suchas those aimeing to develop clean water supplies can also have knoeck-on effects in terms of improving the health of the people – and therefore their capacity to work, boosting economic development. • However, some people argue that aid has not been wholly successful in increasing the level of development in a country because it does not alsways reach those that need it most; moreover, corruption is a problem in many of the receiving countries. • Some developing/emerging countries lack basic infrastructure which makes it hard to use effectively – e.g. the effectiveness of investment in medical and educational facilities will be limited where transport or power resources do not exist. • Aid dependency can be created when aid become as substantial; proprtion of national income – this may deter potential donors from providing aid in the future. • Sometimes, aid comes with 'strings attached' e.g. tied aid where the receipient country has to agree to certain terms and conditions with the donor country.

Level	Mark	Descriptor
	0	No acceptable response.
Level 1	1–3	• Demonstrates isolated elements of understanding of concepts and the interrelationship of 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 that are supported by limited evidence. (AO3)
Level 2	4–6	• Demonstrates elements of understanding of concepts and the interrelationship of places, environments and processes. (AO2) • Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3)
Level 3	7–8	• Demonstrates accurate understanding of concepts and the interrelationship of 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 3 – Resource management

Question number	Answer	Mark
3(a) (i)	C 36 MWh per person Incorrect responses: Options A. B and D do not have the correct value (36 MWh) as their answer.	**(1)**

Question number	Answer	Mark
3(a) (ii)	18	**(1)**

Question number	Answer	Mark
3(a) (iii)	Working to show: Reading of the graph for 2000 (48) and 2009 (25) = 1 mark Correct subtraction of these numbers (48-25) = 23 MWh per person = 1 mark. Maximum of 1 mark if the correct answer is given without any working shown.	**(2)**

Question number	Answer	Mark
3(a) (iv)	Award 1 mark for each of the following, up to a maximum of 3 marks. Maximum of 2 marks if no data used. Overall, the amount of oil has increased during this period (1) The trend has been fluctuating (1) The amount of oil peaked in 1999 (1) Since 1999, the amount of oil used has been in steady decline (1) Use of data to support any of the above points (1) **Accept any other appropriate response**	**(3)**

Question number	Answer	Mark
3(a)(v)	D uranium <u>Incorrect responses:</u> Options A. B and C are all renewable resources	**(1)**

Question number	Answer	Mark
3(b)	Award 1 mark for identifying one way the environment is damaged, and a further 1 mark for an explanation about why this has happened, up to a maximum of 2 marks. Soil erosion can be accelerated (1) due to overgrazing as this leaves the soil exposed to the elements (1). Water quality might decline (1) due to increased usage of chemical fertilisers on the land, which run off into rivers when it rains (1). Reduced air quality (1) as the machinery that is used to cut down trees gives produces carbon emissions (1). Reduction of biodiversity in an area of forest (1) due to deforestation leading to a loss of habitats (1). Loss of trees / biodiversity (1) as the land is cleared allow for mining / quarrying / oil extraction (1). **Accept any other appropriate response.**	**(2)**

Question 4 – Energy resource management

Question number	Answer	Mark
4(a)	A Injection of liquid under pressure to release trapped gas in rocks <u>Incorrect responses:</u> None of the other options describe any aspect of the process of fracking	**(1)**

Question number	Answer	Mark
4(b)	Award 1 mark for any of the following: Non-renewable energy resources will run out sooner (1). Infrastructure for renewables is not developed enough for this to be the sole contributor in the energy mix (1). The world's population is still growing (1) Demand for energy resources / electricity is expected to keep rising (1). **Accept any other appropriate response**	**(1)**

Question number	Answer	Mark
4(c) (i)	Award 1 mark for any of the following: There are many turbines in Figure 4a, and these would have caused lots of CO_2 emissions during construction (1). The wind turbines are very tall which could disrupt migration patterns / kill birds (1). The turbines are right next to a cycle path which might distract / put off people wanting to use it (1). The relief is very flat, which means that the turbine will be visible from miles around (1). **Accept any other appropriate response**	**(1)**

Question number	Answer	Mark
4(c) (ii)	Award 1 mark for an advantage of developing wind power, and a further 1 mark for extension of this point through further explanation, up to a maximum of 4 marks. Wind power is a clean energy resource (1) because it doesn't pollute the air like power plants that rely on combustion of fossil fuels (1) which means that they do not emit greenhouses gases / nitrogen oxides / sulphur dioxide / carbon dioxide (1) which can lead to human health problems / acid rain / global warming (1). Wind power is cost-effective (1) this is because the electricity from wind farms is sold at a fixed price over a long period of time (1) and the fuel (i.e. the wind) is free (1), wind energy avoids the price uncertainty that fuel costs add to traditional/non-renewable sources of energy (1). Wind is a renewable energy resource (1) which means that the supply of wind is abundant / inexhaustible / will not run out (1) which means that it is a long-term option for a country's energy mix (1) and will still be available when fossil fuels such as coal, oil and natural gas have been exhausted (1). Wind turbines can be built on existing farmland (1) which means that they can benefit the economy in rural areas (1) as farmers can continue to work the land because the wind turbines use only a fraction of the land (1), whilst wind power plant owners make rent payments to the farmer for the use of the land, providing landowners with additional income (1). **Accept any other appropriate response**	**(4)**

Question number	Answer	Mark
4(d) (i)	B 15% <u>Incorrect responses:</u> A 5% is the proportion of uranium C 20% is the proportion of coal D 25% is the proportion of natural gas	**(1)**

Question number	Answer	Mark
4(d) (ii)	Working to show: 324 divided by 100 = 3.24 (1) 3.24 x 35 = 113.4 (1) Maximum of 1 mark if the correct answer is given without any working shown.	**(2)**

Question number	Answer	Mark
4(d) (iii)	Award 1 mark for a possible reason for the relatively low proportion of uranium used in Germany's energy mix (shown on Figure 4b), and a further 1 mark for extension through further explanation, up to a maximum of 2 marks. Germany's government policy does not favour uranium (1) as it is non-renewable (1). Germany may not have particularly large reserves of uranium / larger reserves of fossil fuels (1) which means that this type of energy resource is not cost-effective (1). Working with uranium is extremely dangerous (1) because a leak / explosion could expose people to radiation (1). Nuclear power plants are vulnerable to the impacts of natural disasters / terrorist attacks (1) which means that many people do not want a nuclear power station anywhere near their home as they fear for their own safety (1). Nuclear power stations are very expensive to build (1) which means that the energy provider might have to raise tariffs for the consumer to ensure profits are made (1). Nuclear waste is very radioactive / has a large potential for it to pollute the environment with radiation (1) which means that it costs a lot of money to ensure that it is disposed of safely (1). **Accept any other appropriate response**	**(2)**

<table>
<tr><th>Question number</th><th colspan="2">Indicative content</th></tr>
<tr><td>4 (e)</td><td colspan="2">AO2 (4 marks)/AO3 (4 marks)
AO2
• Over the last 100 years, global population has grown very quickly, from approximately under 2 billion at the start of the 20th century to over 7 billion today.
• Rapid population growth in the last century has triggered a great increase in the global demand for energy.
• Another reason why demand has gone up has been the growing affluence; this increased wealth has enabled people to afford technology that requires energy (e.g. increased car ownership, kitchen appliances and central heating in homes).
• Advances in technology during the past 100 years have led to an increase in demand for energy to power them. Different types of technology have influenced the growth of different types of energy resources e.g. the private car revolution led to a growth in oil consumption.
• As country's get wealthier, their capacity to use and to develop new energy resources increases.

AO3
• Rapid population growth has been uneven, with the majority of the growth being in emerging/developing countries; therefore, demand in these countries has grown significantly; in relative terms, this has been a huge shift because the countries previously had very little industry / energy demands.
• As emerging/developing countries become more developed, people are wealthier so that they can afford to use and expoit more energy; this increased ability to supply and develop energy resources is also key to help develop a country's industry – and therefore it's economic development – which further increases wealth and the ability to use more energy.
• As countries get wealthier, they not only are able to use more energy – but the types of energy resources that make up the energy mix can also change; for example, the development of renewables such as wind and solar power is expensive – and therefore not always an option in emerging/developing countries.
• Factors such as government policies and increased awareness about the causes of climate change have influence the amount of different type of energy resources that are used; for example, renewable energy resources are being developed to not just meet gowing demand – but also to address changing attitudes.</td></tr>
<tr><th>Level</th><th>Mark</th><th>Descriptor</th></tr>
<tr><td></td><td>0</td><td>No acceptable response.</td></tr>
<tr><td>Level 1</td><td>1–3</td><td>• Demonstrates isolated elements of understanding of concepts and the interrelationship of 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)</td></tr>
<tr><td>Level 2</td><td>4–6</td><td>• Demonstrates elements of understanding of concepts and the interrelationship of places, environments and processes. (AO2)

• Applies understanding to deconstruct information and provide some</td></tr>
</table>

		logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3)
Level 3	7–8	• Demonstrates accurate understanding of concepts and the interrelationship of 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**
SPGST 0	0	*No marks awarded* • Learners write nothing. • Learners response does not relate to the question. • Learners achievement in SPaG does not reach the threshold performance level, for example errors in spelling, punctuation and grammar severely hinder meaning.
SPGST 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.
SPGST 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.
SPGST 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.

Question 5 – Water resource management

Question number	Answer	Mark
5(a)	D High rate of evaporation <u>Incorrect responses:</u> All of the other options are likely to result in a water surplus instead of a water deficit.	**(1)**

Question number	Answer	Mark
5(b)	Award 1 mark for any of the following: Many people in the world still do not have access to clean water (1). Water supplies are being polluted by domestic / industrial waste (1). The world's population is still growing (1) Demand for water resources is expected to keep rising (1). **Accept any other appropriate response**	**(1)**

Question number	Answer	Mark
5(c) (i)	Award 1 mark for any of the following: Located on the coast / next to the sea or ocean (1). The land appears to flat (1). There is a large area of land available to build on (1). Few people seem to be living in this area (1). Area is well connected by roads (1). **Accept any other appropriate response**	**(1)**

Question number	Answer	Mark
5(c) (ii)	Award 1 mark for either a positive or negative view about desalination and a further 1 mark for extension of this point through further explanation, up to a maximum of 4 marks. **Positive views e.g.** Desalination can provide people with clean / fresh drinking water (1) because it removes dissolved salts and other minerals from seawater (1) which means that it provides a solution for areas that have limited resources of fresh water (1) and therefore a reliable alternative source of water in times of severe drought (1). Desalination can provide more water for agriculture / industry (1) which means that more water is available to farmers for irrigation (1), which means that arid regions or areas experiencing droughts can now grow crops (1) which boosts the economic productivity of a country (1) Desalination uses tried-and-tested technology (1) which means that the method is proven and effective at providing clean water (1) and this is a method that can be considered 'renewable' (1) because there is an almost inexhaustible supply of sea/ocean water (1) Desalination can actually help preserve current freshwater supplies (1) which is important as our freshwater supplies are limited / under increasing pressure (1) as a result of growing demand / population (1) which means that the process of desalination will reduce potential water shortages in the future (1) **Negative views e.g.** The process of desalination requires chemicals (e.g. chlorine) to be added to water before desalination (1) but these can only be used for only a limited amount of time (1) which means that once they've lost their ability to clean the water, these chemicals are dumped (1) which becomes a major environmental concern as they often find their way back into the ocean, where they poison plant and animal life (1). Brine is a waste product of desalination (1) which can be a pollutant if dumped back into the ocean (1) because many species are not equipped to adjust to the immediate change in salinity / decrease in oxygen (1) which can cause animals and plants to suffocate (1). Desalination can increase the amount of brine / chemicals in the water (1) which can kill plankton and phytoplankton, which form the base of all marine life by forming the base of the food chain (1) which then could reduce the biodiversity / number of species further up the food chain (1). By-products of the chemicals used in desalination can get through into the drinking water system (1) which may endanger the people who drink it (1) because desalinated water can be acidic – doesn't agree with human digestive systems (1) which means human health can be placed at risk (1). **Accept any other appropriate response**	**(4)**

Question number	Answer	Mark
5(d) (i)	A 5% <u>Incorrect responses:</u> B 25% is the proportion used in industry C 70% is the proportion used for domestic purposes D 85% is the proportion used for domestic purposes + agriculture	**(1)**

Question number	Answer	Mark
5(d) (ii)	Working to show: 1067 divided by 100 = 10.67 (1) 10.67 x 70 = 746.9 (1) Maximum of 1 mark if the correct answer is given without any working shown.	**(2)**

Question number	Answer	Mark
5(d) (iii)	Award 1 mark for a possible reason for the relatively high proportion of water used in for domestic purposes in The Netherlands (shown on Figure 5b), and a further 1 mark for extension through further explanation, up to a maximum of 2 marks. As The Netherlands is a developed country, the majority of homes will have piped water (1) which means that people will be using water for cooking / cleaning / washing etc. (1). It is a developed country, so average incomes will be relatively high (1) so people will be able to afford to have multiple showers / baths / kitchen appliances etc. in their homes (1). Rainfall levels in the country might be high (1) so the cost of domestic water supplies might be quite low / no restrictions (1). Availability of domestic water might be high / in abundance / relatively cheap (1) which means that more water might be wasted (1). People in The Netherlands might be able to afford / have a lot of leisure time (1) so a greater proportion of water is used in swimming pools / hot tubs etc. (1). The Netherlands might have a well-developed infrastructure of domestic water pipes (1) which means that they do not have to share communal taps / bathe in rivers etc. (1). **Accept any other appropriate response**	**(2)**

<table>
<tr><th>Question number</th><th colspan="2">Indicative content</th></tr>
<tr><td>5 (e)</td><td colspan="2">AO2 (4 marks)/AO3 (4 marks)
AO2
• Over the last 50 years, global population has grown very quickly, and this has triggered an increase in the global demand for water resources.
• Another reason why demand for water resources has gone up has been the growing affluence; this increased wealth has enabled people to afford technology and to spend leisure time doing activities that require water (e.g. washing machines, showers, dishwashers and swimming pools, golf courses).
• Advances in technology during the past 50 years have led to a changes in the way water is used – for example via HEP to generate electricity.
• As developing/emerging countries become wealthier, their capacity to use and to develop new and more sustainable water supplies increases.
• The supply of fresh water to households in developed countries has not changed very much over the last 50 years.
• Water supply is still a major challenge in many developing countries – with a continued reliance on charitable organisations such as WaterAid to provide the means to access clean drinking water.
• As countries develop, demands for food stuffs (e.g. meat and cereals) goes up – and therefore the demand for water in the agricultural sector also goes up.
• Over the last 50 years, greater awareness about personal hygiene (e.g. brushing teeth / daily shower) has led to a large increase in the demand for water.

AO3
• Rapid population growth has been uneven, with the majority of the growth being in emerging/developing countries; in these countries, water is predominately used in agriculture – and increased affluence means that technology (e.g. irrigation systems) can be used to water crops.
• In developed countries, a major factor that affects the supply of water is the variation in annual rainfall; this has resulted in some areas experiencing drought conditions e.g. UK several times in the last 50 yeas / since summer 1976.
• In emerging countries industrialisation has led to a very rapid increase in the demand for water e.g. in factories and in thermal power stations. In addition to this, industrialisation in emerging/developing countries often leads to environmental degrdation – in particular the pollution of water courses. In theory, these countries can now afford afford to manage their water resources in a more sustainable way – but this is not always the case.
• In some countries, the growing demand for water resources is out-stripping supply. This can lead to water shortages – and the need for investment into large-scale water transfer / storage schemes.</td></tr>
<tr><th>Level</th><th>Mark</th><th>Descriptor</th></tr>
<tr><td></td><td>0</td><td>No acceptable response.</td></tr>
<tr><td>Level 1</td><td>1–3</td><td>• Demonstrates isolated elements of understanding of concepts and the interrelationship of 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)</td></tr>
<tr><td>Level 2</td><td>4–6</td><td>• Demonstrates elements of understanding of concepts and the</td></tr>
</table>

		interrelationship of places, environments and processes. (AO2) • Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3)
Level 3	7–8	• Demonstrates accurate understanding of concepts and the interrelationship of 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**
SPGST 0	0	*No marks awarded* • Learners write nothing. • Learners response does not relate to the question. • Learners achievement in SPaG does not reach the threshold performance level, for example errors in spelling, punctuation and grammar severely hinder meaning.
SPGST 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.
SPGST 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.
SPGST 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.