A-level
GEOGRAPHY
7037/2

Paper 2 Human geography

Mark scheme

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236A7037/2/MS

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this mark scheme are available from aqa.org.uk

Level of response marking instructions

Level of response mark schemes are broken down into levels, each of which has a descriptor. The descriptor for the level shows the typical performance for the level. There are marks in each level.

Before you apply the mark scheme to a student's answer read through the answer and annotate it (as instructed) to show the qualities that are being looked for. You can then apply the mark scheme.

The notes for answers provide indicative content. Students' responses may take a different approach in relation to that which is typical or expected. It is important to stress that examiners must consider all a student's work and the extent to which this answered the question, irrespective of whether a response follows an expected structure. If in doubt the examiner should contact their team leader for advice and guidance.

Step 1 Determine a level

Start at the lowest level of the mark scheme and use it as a ladder to see whether the answer meets the descriptor for that level. The descriptor for the level indicates the different qualities that might be seen in the student's answer for that level. If it meets the lowest level then go to the next one and decide if it meets this level, and so on, until you have a match between the level descriptor and the answer. With practice and familiarity you will find that for better answers you will be able to quickly skip through the lower levels of the mark scheme.

When assigning a level you should look at the overall quality of the answer and not look to pick holes in small and specific parts of the answer where the student has not performed quite as well as the rest. If the answer covers different aspects of different levels of the mark scheme you should use a best fit approach for defining the level and then use the variability of the response to help decide the mark within the level, ie if the response is predominantly Level 3 with a small amount of Level 4 material it would be placed in Level 3 but be awarded a mark near the top of the level because of the Level 4 content.

Step 2 Determine a mark

Once you have assigned a level you need to decide on the mark. The descriptors on how to allocate marks can help with this. The exemplar materials used during standardisation will help. There will be an answer in the standardising materials which will correspond with each level of the mark scheme. This answer will have been awarded a mark by the Lead Examiner. You can compare the student's answer with the example to determine if it is the same standard, better or worse than the example. You can then use this to allocate a mark for the answer based on the Lead Examiner's mark on the example.

You may well need to read back through the answer as you apply the mark scheme to clarify points and assure yourself that the level and the mark are appropriate.

Indicative content in the mark scheme is provided as a guide for examiners. It is not intended to be exhaustive and you must credit other valid points. Students do not have to cover all of the points mentioned in the indicative content to reach the highest level of the mark scheme.

An answer which contains nothing of relevance to the question must be awarded no marks.

Section A

Qu	Part	Marking guidance	Total marks
01	1	**Outline how patterns of global production and consumption reflect globalisation.** Point marked Allow 1 mark per valid point with extra mark(s) for developed points (d). For example: Notes for answers Allow credit for specific knowledge and understanding of how the global patterns of production and consumption reflect globalisation. Max 3 if response only covers production or consumption. • No mark for a definition of globalisation. • Global patterns of production and consumption are changing as a result of increased globalisation (1). In the past production was concentrated in less developed nations and consumption mainly in developed economies (1). More recently, many former LICs have developed their own production and commercial industrial bases becoming NEEs (1). The TNCs from such countries have recently invested in former deindustrialised areas of developed economies (1) (d). • Manufacturing moves around the world with great ease (1) so TNCs dictate where their products are made, usually where labour costs are lower (1) (d). • Consumers in HICs dominate the demand for products (1). Products made by LICs and NEEs are mainly exported to HICs in Europe and North America (1) (d). • The pattern of consumption is changing as consumers in NEEs become more affluent (1). Asian countries are demanding a bigger share of the exports from their own region (1) (d). The notes for answers are not exhaustive. Credit any valid points.	**4** **AO1 = 4**

01	2	**Analyse the data shown in Figure 1a and Figure 1b.** **AO3** – Analysis of the compound bar graph and line graph showing data about economic assets and liabilities. Mark scheme **Level 2 (4–6 marks)** **AO3** – Clear analysis of the quantitative evidence provided which makes appropriate use of data to support. Clear connections between different aspects of the data. **Level 1 (1–3 marks)** **AO3** – Basic analysis of the quantitative evidence provided which makes limited use of data to support. Basic or limited connections between different aspects of the data. Notes for answers This question requires analysis of assets and liabilities shown in Figure 1a and 1b. There should be analysis of the compound bars to show the global variation in the proportion of assets and liabilities shown in 1a and the line graph to consider the change in debt levels over time. Connections can be made between Figure 1a and 1b and within the data sets, for example by analysing the relationship between assets and liabilities or the link between NEEs, LICs and more advanced economies. **AO3** • Figure 1a shows that there is considerable variation in the countries shown in the percentage of assets in relation to GDP. For example, El Salvador's assets are only about 50% of its GDP whereas Norway's are about 650%. • The amount of total liabilities also varies, Portugal having the highest at about 400% of its GDP whereas Kazakhstan is about 75%. • There is no clear pattern between assets and liabilities. Some of the countries with the highest assets have smaller proportions of debts but this is not consistent. For example, Japan has the fourth / fifth highest level of assets in 1a but has the second highest proportion of debt. • Most countries in 1a have a net worth that is an asset with only two countries having a net worth showing a liability greater than –100% of their GDP. • Figure 1b shows that the total debt, whilst fluctuating shows an overall increase between 1970 and 2019, more than trebling from 50% of GDP in 1970 to 165% in 2019. • Figure 1b shows the total debt level of NEEs and LICs is not always reflected by the countries in 1a. For example, Peru, Indonesia, Kenya and Uganda, all have levels far below the average of 150% shown in Figure 1b.	**6** **AO3 = 6**

		• Figure 1b shows that in 2016 private debt accounted for about two thirds of the debt. This is also evident in 1a for many countries such as Brazil, Peru and Uganda. Credit any other valid analysis.	

01	3	**Using Figure 2a, Figure 2b and your own knowledge, assess the extent to which global systems cause injustices for people.** **AO1** – Knowledge and understanding of how global systems can lead to inequalities and injustices. **AO2** – Applies knowledge and understanding to the novel situation to analyse and evaluate the extent to which global systems result in injustices for people in Vietnam. <u>Mark scheme</u> **Level 2 (4–6 marks)** **AO1** – Demonstrates clear knowledge and understanding of concepts, processes, interactions and change. **AO2** – Applies knowledge and understanding to the novel situation offering clear analysis and evaluation drawn appropriately from the context provided. Connections and relationships between different aspects of study are evident with clear relevance. **Level 1 (1–3 marks)** **AO1** – Demonstrates basic knowledge and understanding of concepts, processes, interactions, change. **AO2** – Applies limited knowledge and understanding to the novel situation offering basic analysis and evaluation drawn from the context provided. Connections and relationships between different aspects of study are basic with limited relevance. <u>Notes for answers</u> This question requires knowledge of injustices caused by global systems. Students should apply this knowledge to assess the extent to which theses injustices exist as a result of global systems in Vietnam. For Level 2 there must be reference to Figure 2a and/or Figure 2b. **AO1** • Form and nature of interdependence in the contemporary world. • Issues associated with interdependence – unequal flows of money, people and ideas. • The links between global systems and injustices, inequalities and conflicts. • Unequal power relations in global systems. • The impacts of TNCs. **AO2** • Evaluation of the extent to which injustices are shown in Figure 2a; the factory is clearly crowded and there is very little natural light. The stools and hunched positions may cause health problems. However, it is orderly and looks clean. Workers are wearing uniforms to protect their own clothes. • Figure 2a shows perhaps why strikes are common, as the workers may feel that the working conditions are poor. Figure 2b states that	**6** **AO1 = 2** **AO2 = 4**

		Vietnam is hit by several hundred labour strikes a year and mostly over working conditions and low pay. • Figure 2b suggests that workers are striking as a result of government policies on social insurance. This could infer that injustices are not just as a result of global systems as this is a national policy. However, it is likely the government policy is driven by global systems to make Vietnam attractive to TNCs. • The policy is designed to prevent people from resigning. This certainly seems unjust as this means they have to accept whatever working conditions are imposed on them by the footwear factory. Conditions in Vietnam and other SE Asian countries are frequently very poor, with workers forced to do more than 50 hours of overtime a week. • Analysis of the extent to which global systems cause inequalities in Vietnam. Figure 2b suggests that there are several hundred labour strikes a year, mainly over poor working conditions and low pay. This suggests that the manufacturing base providing cheap goods for HICs is certainly creating injustices in Vietnam. • The extent to which global systems might cause growth and stability in Vietnam may be considered. For example, although workers frequently strike over poor working conditions, they often earn higher wages working for TNCs than local companies. Many TNCs also provide education and healthcare for their workers. • There may be an overall assessment of the role of global systems in causing injustices, considering it relative to other factors causing injustices in countries such as Vietnam. This is a legitimate approach. Credit any other valid approach.	

01	4	**'The impacts of changes in the carbon cycle represent the greatest threat to Antarctica and the Southern Ocean.'** **How far do you agree with this view?** **AO1** – Knowledge and understanding of the threats to Antarctica. Knowledge and understanding of the impacts of change in carbon cycles upon the land and oceans. **AO2** – Application of knowledge and understanding to analyse and evaluate the extent to which changes in the carbon cycle present the greatest threat to Antarctica. <u>Notes for answers</u> The question requires students to make cross-specification links between the units on 'Global systems and global governance' and 'Water and carbon cycles'. They need to apply knowledge of impacts from changes in the carbon cycle to the impacts of climate change on Antarctica and the Southern Ocean and assess whether this is the greatest threat. **AO1** • Knowledge and understanding of systems in physical geography – carbon cycles. Inputs, outputs, stores, flows, positive/negative feedback and dynamic equilibrium. • The carbon budget and the impact of the carbon cycle upon land and ocean. • The contemporary geography of Antarctica and the Southern Ocean. • Threats to Antarctica due to climate change, fishing and whaling, mineral exploration and tourism. • Governance of Antarctica and other Global Commons – international organisations and NGOs. • Strategies for enhancing protection of Antarctica and other global commons. **AO2** • Analysis of changing carbon cycles on Antarctica. Climate change as a result of increased carbon in the atmosphere is changing the geography. The Antarctic Peninsula has seen ice shelves such as Larsen breaking up. However, the interior has seen an increase in ice thickness • Analysis of the impact of changing carbon cycles. For example, increased carbon leads to higher temperatures and the subsequent reduced snow cover on the peninsula means more plant growth, increasing carbon sequestration. This might increase biodiversity, but present a threat to specialised lichens and mosses and impact fragile food webs. • Impact of changing carbon budget on the Southern Ocean. Increased CO_2 leads to a warming Southern Ocean, which decreases phytoplankton, leading to less carbon being taken from the	**20** **AO1 = 10** **AO2 = 10**

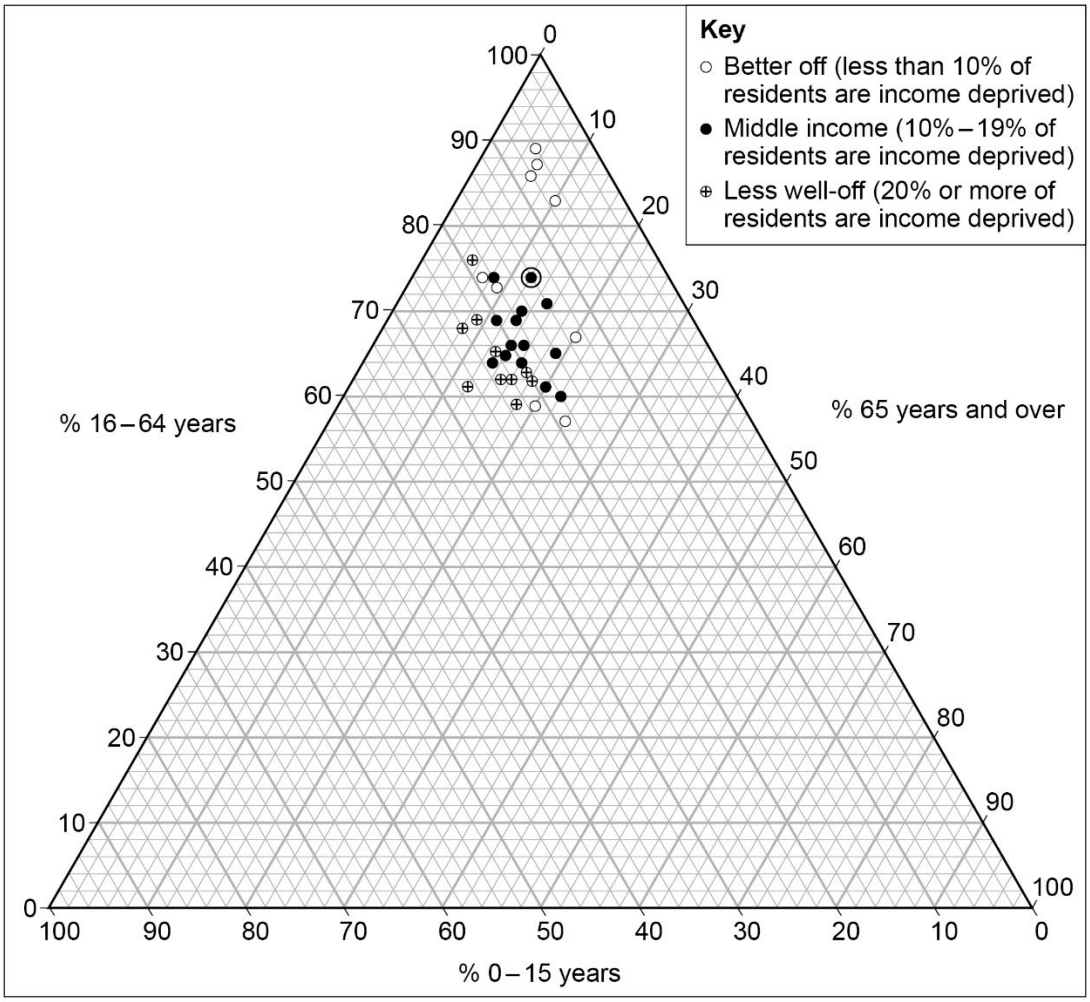
		atmosphere, meaning increased global warming and even warmer ocean temperatures. • Evaluation of the role of international agreements in mitigating climate change may be considered, for example the Paris Agreement to limit carbon emissions is trying to reduce the impact of climate change on our oceans and Antarctica. Therefore, changing carbon cycles may present less of a threat. • Evaluation of the extent to which other threats pose a greater threat. Overfishing of krill has led to widespread disruption in food chains in the Southern Ocean. Tourism has threatened penguin breeding colonies in many parts of coastal Antarctica. • The extent to which other threats to Antarctica can be managed by IGOs and NGOs. For example, the International Whaling Convention monitors and conserves whaling stocks in the Southern Ocean. However, it has no authority to enforce its decisions. • Alternative futures in terms of different climate change scenarios would also be relevant. • Consideration of assessing the level of threat posed by climate change, compared to threats we can already assess would also be relevant. For example, we already know the threat of overfishing on whale stocks but don't yet know for certain, what the impact of 2 ^{o}C increase in temperature will be. • Overall conclusion should seek to consider the extent to which changing carbon cycles have an impact and whether the subsequent climate change is the greatest threat. It should be supported by the body of the text and evidence provided. Any valid assessment will be credited.	

Marking grid for Question 1.4

Level/ Mark Range	Criteria/Descriptor
Level 4 (16–20 marks)	• Detailed evaluative conclusion that is rational and firmly based on knowledge and understanding which is applied to the context of the question (AO2). • Detailed, coherent and relevant analysis and evaluation in the application of knowledge and understanding throughout (AO2). • Full evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Detailed, highly relevant and appropriate knowledge and understanding of place(s) and environments used throughout (AO1). • Full and accurate knowledge and understanding of key concepts and processes throughout (AO1). • Detailed awareness of scale and temporal change which is well integrated where appropriate (AO1).
Level 3 (11–15 marks)	• Clear evaluative conclusion that is based on knowledge and understanding which is applied to the context of the question (AO2). • Generally clear, coherent and relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Generally clear evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Generally clear and relevant knowledge and understanding of place(s) and environments (AO1). • Generally clear and accurate knowledge and understanding of key concepts and processes (AO1). • Generally clear awareness of scale and temporal change which is integrated where appropriate (AO1).
Level 2 (6–10 marks)	• Some sense of an evaluative conclusion partially based upon knowledge and understanding which is applied to the context of the question (AO2). • Some partially relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Some evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Some relevant knowledge and understanding of place(s) and environments which is partially relevant (AO1). • Some knowledge and understanding of key concepts, processes and interactions and change (AO1). • Some awareness of scale and temporal change which is sometimes integrated where appropriate. There may be a few inaccuracies (AO1).
Level 1 (1–5 marks)	• Very limited and/or unsupported evaluative conclusion that is loosely based upon knowledge and understanding which is applied to the context of the question (AO2). • Very limited analysis and evaluation in the application of knowledge and understanding. This lacks clarity and coherence (AO2). • Very limited and rarely logical evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Very limited relevant knowledge and understanding of place(s) and environments (AO1). • Isolated knowledge and understanding of key concepts and processes (AO1). • Very limited awareness of scale and temporal change which is rarely integrated where appropriate. There may be a number of inaccuracies (AO1).
Level 0 (0 marks)	• Nothing worthy of credit.

Section B

Qu	Part	Marking guidance	Total marks
02	1	**Outline how you used one data source to investigate lived experience in your distant place**. Point marked Allow 1 mark per valid point with extra mark(s) for developed points (d). If more than one data source, then credit best one. Whilst they do not need to name the distant place, max 3 marks if a generic response with no discernible specific place characteristics. Notes for answers • Reference to a data source / evidence eg questionnaire, photographs, poems, environmental quality survey (1). • Credit for clear knowledge of the concept of lived experience (1). • Use of census data to investigate lived experience in my distant place. Comparing level of education to show the extent of deprivation (1). • Use of a questionnaire to find out about perception of well-being in distant place of Toxteth (1). Google forms used to collect data on happiness on a Toxteth Facebook group representing local people (1). People were asked to rate their 'happiness yesterday' on a scale of 1 to 5 (1). From this I could see that 77% of people rated their well-being as being good (1) (d). • A song was used to see how local people perceive their town (1). The lyrics mentioned traffic congestion (1). Traffic cameras were then used to conduct a traffic count to see if this subjective lyric was an accurate reflection of lived experience (1) (d). • Use of photographs of the distant place showed that there was high building density making the area look overcrowded (1). The photograph showed that building quality looked poor with broken windows and gutters perhaps indicating deprivation (1). • 1 mark for a list of sources (questionnaires, environmental quality survey, photographs….) if there is nothing else of credit. The Notes for answers are not exhaustive. Credit any valid points.	**4** **AO1 = 4**

02	2	**Complete Figure 3a by plotting the data for Southville shown in Figure 3b and analyse the data shown in the completed Figure 3a.** **AO3 –** Evaluation and analysis of the quantitative data shown in **Figure 3a**. Mark scheme  2 marks for plotting Southville accurately. 1 mark if key is incorrect. No mark unless the point is plotted correctly on all three axes. 4 marks for analysing the data shown in Figure 3a. Notes for answers The question requires an analysis of the relationship between age breakdown and socio-economic status of wards in Bristol. **AO3** • In general, there is a clear relationship between socio-economic status and age breakdown in Bristol. The wealthier the ward the less children there are (1). For example, 4 of better-off wards have less than 10% 0-15 year olds (1), whereas only one of the less well-off wards have less than 20% of 0-15 year olds (1).	**6 AO3 = 6**

		• The relationship between socio-economic status and people over 65 is less clear, as both middle income and better off have populations made up of at least 20% over 65s (1). The highest percentage is 24% in a better-off ward (1). However, the lowest percentages of over 65s is found at 5% in two wards – one less-well off and one better-off (1). • The 4 wards with lowest amounts of 0-15 year olds are all better-off wards (1). All 4 wards have the highest percentages of 16-64-year olds, all above 83% (1). • Most of the middle-income wards are found in a narrow band of age breakdown having between 10-20% over 65-year olds and 60-70% 16-64-year olds (1). • 1 mark can be awarded for a mathematical analysis relating to the number of wards in each category (Better off = 9, Middle income = 14 (including Southville), Less well-off = 10) (1). • 1 mark can also be awarded given for some manipulation of this data eg Better off = 27%... (1) Credit any other valid evaluation and analysis.	

02	3	**Using Figure 4a, Figure 4b and your own knowledge, evaluate the role of past processes in creating present-day place meanings.** **AO1** – Knowledge and understanding of place meaning. Knowledge and understanding of the influence of past and present processes of development on social and economic characteristics of place. **AO2** – Application of knowledge and understanding to this novel situation. Interpretation of **Figures 4a and 4b** to evaluate the role of past processes in influencing present-day place meaning. <u>Mark scheme</u> **Level 2 (4–6 marks)** **AO1** – Demonstrates clear knowledge and understanding of concepts, processes, interactions and change. **AO2** – Applies knowledge and understanding to the novel situation offering clear analysis and evaluation drawn appropriately from the context provided. Connections and relationships between different aspects of study are evident with clear relevance. **Level 1 (1–3 marks)** **AO1** – Demonstrates basic knowledge and understanding of concepts, processes, interactions, change. **AO2** – Applies limited knowledge and understanding to the novel situation offering basic analysis and evaluation drawn from the context provided. Connections and relationships between different aspects of study are basic with limited relevance. <u>Notes for answers</u> The question requires an understanding of how past processes influence present-day place meaning. Candidates must look for evidence of past processes from the Figures 4a and 4b and explain how these influence present-day place meaning. Reference to places other than Albert Docks can be credited as AO1 knowledge. For L2 there must be reference to **Figures 4a and 4b**. **AO1** • Knowledge and understanding of the way humans form attachments to places and how they present the world to others. • The concept of place-meaning. • The influence of past and present processes of development on social and economic characteristics. • The influence of past and present processes of development on present-day place meaning. • Place meaning in places other than Albert Docks. **AO2** • Interpretation of Figure 4a suggest that place-meaning in the past was different to present day place-meaning in 4b. In 4a, the area is very much a working dock with large ships and warehouses.	**6** **AO1 = 2** **AO2 = 4**

		• Figure 4b suggests that place-meaning has changed over time. The area now seems to be predominantly an entertainment area, with shops and restaurants and there is no longer a working dock. • The past processes associated with industrialisation and shipping trade shown in 4a, clearly influence present-day meaning as the area is still referred to as a dock. • Interpretation of Figure 4b suggests that the past processes of trade and industry influence present-day meaning, in that much of the infrastructure has been left to emphasise the dockland place-meaning. • Evaluation of Figure 4a suggests that present processes of development and the rise of the service economy may also be influencing place-meaning in that the area is now dominated by services such as shopping and restaurants. • Candidates may come to a conclusion on the extent to which place-meaning is based on past processes in the Albert Docks. Credit any other valid assessment.	

02	4	**You have studied either economic change or changing cultural characteristics.** **Assess the contrasting impact of one of these factors on the characters of your local and distant places.** **AO1** – Knowledge and understanding of their local and distant place. Knowledge and understanding of the importance of changing cultural characteristics or economic change in developing the character of a place. **AO2** – Applies this knowledge and understanding to assess the contrasting impact of changing cultural characteristics or economic change in developing the character of place in the local and distant place studies. <u>Notes for answers</u> The question links different parts of the theme of Changing places, specifically the connections between economic or cultural characteristics of places and the local and distant place study. The question is very open-ended, and candidates may attempt this in a variety of ways. However, there should be a focus on the contrasting role of their chosen option (economic change or changing cultural characteristics) in developing the **characters** of their distant and local place. Assessment of the impact might be considered in contrast to other factors. If they refer to both economic change and cultural characteristics, credit the best response. **AO1** • Knowledge and understanding of the impact of changing cultural characteristics or economic change on people and place. • How demographic, socio-economic and cultural characteristics of places are shaped by shifting flows of people, resources, money and investment. • Factors contributing to the character of place. • Local and distant place studies – character and lived-experience of the place. • The local and distant place characteristics over time. Changing socio-economic **or** cultural characteristics. • The use of data sources to investigate place characteristics. **AO2** • Analysis of the extent of the impact of economic change **or** cultural characteristics on the character of the local place. For example, cultural characteristics in Spitalfields built environment reflects different waves of immigration. • Analysis of the extent of the impact of economic change or cultural characteristics on the character of the distant place. The character of Ancoats in Manchester still reflects its cotton manufacturing past in the use of street names and street furniture.	**20** **AO1 = 10** **AO2 = 10**

		• The impact of economic change or cultural characteristics on people and lived experience might be considered. • Temporal change in the characteristics of the local and distant place in relation to economic change or cultural characteristics. • The contrasts in the characteristics of the local place and distant place. • Evaluation of the role of economic change or cultural characteristics in developing the character of the local and distant place. This may be considered in relation to other factors such as social inequality or demographic change. • Evaluation of the role of endogenous and exogenous factors in developing the character of place in contrast to economic change or cultural characteristics. • There should be an overall conclusion. Any conclusion is valid as long as it is supported by evidence in the body of the response. Credit any other valid approach.	

Marking grid for Question 2.4

Level/ Mark Range	Criteria/Descriptor
Level 4 (16–20 marks)	• Detailed evaluative conclusion that is rational and firmly based on knowledge and understanding which is applied to the context of the question (AO2). • Detailed, coherent and relevant analysis and evaluation in the application of knowledge and understanding throughout (AO2). • Full evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Detailed, highly relevant and appropriate knowledge and understanding of place(s) and environments used throughout (AO1). • Full and accurate knowledge and understanding of key concepts and processes throughout (AO1). • Detailed awareness of scale and temporal change which is well integrated where appropriate (AO1).
Level 3 (11–15 marks)	• Clear evaluative conclusion that is based on knowledge and understanding which is applied to the context of the question (AO2). • Generally clear, coherent and relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Generally clear evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Generally clear and relevant knowledge and understanding of place(s) and environments (AO1). • Generally clear and accurate knowledge and understanding of key concepts and processes (AO1). • Generally clear awareness of scale and temporal change which is integrated where appropriate (AO1).
Level 2 (6–10 marks)	• Some sense of an evaluative conclusion partially based upon knowledge and understanding which is applied to the context of the question (AO2). • Some partially relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Some evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Some relevant knowledge and understanding of place(s) and environments which is partially relevant (AO1). • Some knowledge and understanding of key concepts, processes and interactions and change (AO1). • Some awareness of scale and temporal change which is sometimes integrated where appropriate. There may be a few inaccuracies (AO1).
Level 1 (1–5 marks)	• Very limited and/or unsupported evaluative conclusion that is loosely based upon knowledge and understanding which is applied to the context of the question (AO2). • Very limited analysis and evaluation in the application of knowledge and understanding. This lacks clarity and coherence (AO2). • Very limited and rarely logical evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Very limited relevant knowledge and understanding of place(s) and environments (AO1). • Isolated knowledge and understanding of key concepts and processes (AO1). • Very limited awareness of scale and temporal change which is rarely integrated where appropriate. There may be a number of inaccuracies (AO1).
Level 0 (0 marks)	• Nothing worthy of credit.

Section C

Qu	Part	Marking guidance	Total marks
03	1	**Outline how the rise of the service economy has led to urban change.** Point marked Allow 1 mark per valid point with extra mark(s) for developed points (d). There is no requirement to include a specific example of an urban area, but give credit where appropriate. Notes for answers • The service economy includes a diverse range of activities in both the tertiary and quaternary sectors, for example health services, finance and software design (1). • Population growth and increased consumer wealth drove the shift in the service economy (1). Today over 80% of people are employed in the service economy compared to 45% in 1950 (1) (d). • The expansion of the service sector in many urban areas has happened as a result of globalisation and the growth of TNCs (1). This has caused a growth in corporate headquarters where TNCs can operate their global activities (1). This has changed the urban built environment with large modern structures being built to house these corporations (1) (d). For example, the large ring of Apple HQ, in Cupertino, Silicon Valley dominates the landscape (1) (d). • The growth of the service economy has led to challenges in urban areas. The loss of manufacturing jobs has not always been compensated by the growth in service jobs (1). This has led to high unemployment and greater social inequality in many HIC urban areas (1) (d). • The growth of 'homeworking' and reduction in commuting / office vacancies has led to urban change (1). The notes for answers are not exhaustive. Credit any valid points.	**4** **AO1 = 4**
03	2	**Analyse the data shown in Figure 5.** **AO3** – Analysis of the relationship between urbanisation and economic wealth in selected countries. Mark scheme **Level 2 (4–6 marks)** **AO3** – Clear analysis of the quantitative evidence provided which makes appropriate use of data to support. Clear connections between different aspects of the data.	**6** **AO3 = 6**

		Level 1 (1–3 marks) **AO3** – Basic analysis of the quantitative evidence provided which makes limited use of data to support. Basic or limited connections between different aspects of the data. <u>Notes for answers</u> The question requires analysis of the data shown in Figure 5. Connections should be made between different aspects of the data shown in Figure 5 such as urbanisation, GDP and spatial patterns. **AO3** • There is a positive correlation, as GDP increases the share of population living in urban areas increases. For example, Niger has the third lowest GDP about $900 per capita and the lowest % urban population at 18%, whereas Singapore is the wealthiest country with a GDP more than 60 times greater than that of Niger with 100% urban population. • There are many anomalies. For example, Sri Lanka has a GDP just over $10000 per capita but it has an urban population of 19%. You would expect a much higher percentage around 60% for this level of wealth. • The relationship between GDP and % urban population is less clear between $5000 and $20000. At this level of wealth, urban populations do not show any clear patterns with urban populations varying between 19 and 75%. • The logarithmic scale of the X axis should be acknowledged and reflected - for example, there are 10 countries with similar GDPs between about $800 and $3000 but they have big differences in urban populations. • There is also a regional pattern, with countries in Africa mainly having low levels of urbanisation below 50%. No countries in Europe, North and South America have urban populations below 50%. Credit any other valid analysis.	

03	3	**Using Figure 6a, Figure 6b and your own knowledge, evaluate the success of pollution reduction policies in cities such as Mexico City.** **AO1** – Knowledge and understanding of environmental problems in urban areas. Knowledge and understanding of pollution reduction policies in urban areas. **AO2** – Application of knowledge and understanding to evaluate urban pollution reduction policies such as those shown in Figure 6a and 6b. <u>Mark scheme</u> **Level 3 (7–9 marks)** **AO1** – Demonstrates detailed knowledge and understanding of concepts, processes, interactions and change. These underpin the response throughout. **AO2** – Applies knowledge and understanding appropriately with detail. Connections and relationships between different aspects of study are fully developed with complete relevance. Analysis and evaluation are detailed and well supported with appropriate evidence. A well balanced and coherent argument is presented. **Level 2 (4–6 marks)** **AO1** – Demonstrates some appropriate knowledge and understanding of concepts, processes, interactions and change. These are mostly relevant though there may be some minor inaccuracy. **AO2** – Applies some knowledge and understanding appropriately. Connections and relationships between different aspects of study are emerging/evident with some relevance. Analysis and evaluation are evident and supported with some appropriate evidence. A clear but partial argument is presented. **Level 1 (1–3 marks)** **AO1** – Demonstrates basic/limited knowledge and understanding of concepts, processes, interactions and change. These offer limited relevance with inaccuracy. **AO2** – Applies limited knowledge and understanding. Connections and relationships between different aspects of study are basic with limited relevance. Analysis and evaluation are basic and supported with limited appropriate evidence. A basic argument is presented. <u>Notes for answers</u> This question requires an evaluation of urban pollution reduction policies. They are required to apply their knowledge and understanding to pollution reduction policies in Mexico City from Figure 6a and 6b but may also consider other urban pollution reduction policies. There is no credit for pollution reduction policies that are not clearly urban. The pollution reduction policies can relate to any urban environmental problem and is not restricted to atmospheric pollution.	**9** **AO1 = 4** **AO2 = 5**

		AO1 • Knowledge and understanding of urban pollution reduction policies • Urban climates – urban heat island effect. • Air quality – particulate and photo-chemical pollution. • Environmental problems in urban areas: atmospheric pollution, water pollution and dereliction. • Strategies to manage atmospheric pollution. • Case-study knowledge and understanding of environmental problems in contrasting urban areas. **AO2** • Analysis of the factors that might contribute to atmospheric pollution in Mexico City. For example, Figure 6a shows the area is very densely packed with considerable urban sprawl. This will cause considerable urban heat island effect. Mexico City is surrounded by mountains which trap in particulates. • Analysis of strategies used to reduce pollution in Mexico City. Figure 6b shows there has been a diverse range. • Evaluation of the effectiveness of strategies in Figure 6b. In 1989, the 'Hoy No Circula' programme was implemented which meant that only certain number plates could enter on certain days. Whilst the aim was to reduce the number of vehicles by a fifth, wealthier people were able to circumvent the policy by buying multiple cars. • The policies in 6b have shown they are effective to a large extent as in they have achieved their target of being 150 on the air pollution scale. • However, they may consider that Figure 6a shows smog lying over the city so may observe that the strategies in Figure 6b might be not that successful as there is clearly still an extensive smog. • Students may use other examples of pollution reduction policies to support their evaluation of those in Figure 6b. For example, Beijing has implemented similar car registration policies with limited success. • They should come to an overall conclusion that evaluates the success of pollution reduction policies. Credit any other valid approach.	

03	4	**'The success of recycling schemes to reduce waste in urban areas depends on the economic characteristics and attitudes of the population.'** **How far do you agree with this view?** **AO1** – Knowledge and understanding of urban waste generation and approaches to waste disposal. Knowledge and understanding of the relationship between attitudes of a population and waste streams. **AO2** – Application of knowledge and understanding to analyse and evaluate the extent to which the success of recycling schemes in urban areas is dependent on the economic characteristics and attitudes of the population. <u>Mark scheme</u> **Level 3 (7–9 marks)** **AO1** – Demonstrates detailed knowledge and understanding of concepts, processes, interactions and change. These underpin the response throughout. **AO2** – Applies knowledge and understanding appropriately with detail. Connections and relationships between different aspects of study are fully developed with complete relevance. Analysis and evaluation are detailed and well supported with appropriate evidence. A well balanced and coherent argument is presented. **Level 2 (4–6 marks)** **AO1** – Demonstrates some appropriate knowledge and understanding of concepts, processes, interactions and change. These are mostly relevant though there may be some minor inaccuracy. **AO2** – Applies some knowledge and understanding appropriately. Connections and relationships between different aspects of study are emerging/evident with some relevance. Analysis and evaluation are evident and supported with some appropriate evidence. A clear but partial argument is presented. **Level 1 (1–3 marks)** **AO1** – Demonstrates basic/limited knowledge and understanding of concepts, processes, interactions and change. These offer limited relevance with inaccuracy. **AO2** – Applies limited knowledge and understanding. Connections and relationships between different aspects of study are basic with limited relevance. Analysis and evaluation are basic and supported with limited appropriate evidence. A basic argument is presented. <u>Notes for answers</u> This question requires students to evaluate the success of recycling schemes by considering the attitudes and economic characteristics of the population. There is no requirement to include a specified urban area but where this approach is included, credit as appropriate.	**9** **AO1 = 4** **AO2 = 5**

		AO1 • Knowledge and understanding of urban physical waste generation: sources of waste – industrial and commercial activity, personal consumption. • Relation of waste components and waste streams to economic characteristics, lifestyles and attitudes. • The environmental impacts of alternative approaches to waste disposal: recycling. • Environmental problems in urban areas. • Contemporary opportunities and challenges in developing more sustainable cities. **AO2** • Analysis of the sources of urban waste and their links to economic characteristics and attitudes of the population. HIC populations produce 10-30 times more waste than those in LICs. • Waste source also varies, plastics and metals increase with higher disposable incomes and living standards. LICs have a higher proportion of compostable waste in the waste stream. • Evaluation of recycling schemes as strategy of managing waste. Resource recovery saves considerable energy and reduces landfill. However, much recycled waste ends up in landfill due to contamination. • Evaluation of the relationship between attitudes of populations and recycling. Ease of access is important. For example, only 52% of people living in flats in urban areas reported being able to recycle compared to 74% of people living in rural areas. • The extent to which economic characteristics impact on the success of recycling schemes. In many LICs, recycling is informal but is an active method of recycling. However, official recycling rates are very low – in Manila only 10% of all rubbish is officially recycled, compared to about 52% in London. • They may come to an overall conclusion that evaluates the link between economic characteristics and attitudes and the success of recycling schemes. Credit any other valid approach.	

03	5	**Assess the relative importance of physical and human factors in creating patterns of economic inequality in contrasting urban areas you have studied.** **AO1** – Knowledge and understanding of spatial patterns of economic inequality. Knowledge and understanding physical and human factors in urban forms. Knowledge and understanding of two contrasting urban areas. **AO2** – Application of knowledge and understanding to analyse and evaluate the relative importance of human and physical factors in creating patterns of economic inequality in two contrasting urban areas.	**20** **AO1 = 10** **AO2 = 10**

Notes for answers

The question requires students to consider the relative importance of physical and human factors in creating the patterns of inequality. The question is quite broad, and they could tackle the question in a variety of ways. There should be reference to contrasting areas, however the contrast can be seen in a number of ways, for example wealth, scale, location. The contrasting areas could be two different parts of one city.

AO1

- An understanding of the physical and human factors in urban forms.
- Knowledge and understanding of the strategies used to manage the issues associated with economic inequality.
- Knowledge of urban policies in Britain and other countries.
- Spatial patterns of economic inequality and social segregation in urban areas.
- Knowledge and understanding of the physical and human characteristics of two contrasting urban areas.
- Processes – urbanisation, suburbanisation, counter-urbanisation and urban-resurgence.
- Urban change – deindustrialisation, decentralisation and rise of the service economy.

AO2

- Analysis of the spatial pattern of economic inequality in two urban areas.
- Analysis of physical factors contributing to economic inequality in the two urban areas. Examples might include, relief, topography, climate, drainage.
- Analysis of human factors contributing to economic inequality in contrasting urban areas. Examples might include land-use, government policies, globalisation, demographic change.
- Temporal change in patterns of inequality may be considered, alongside the reasons for these.
- Analysis of the severity of economic inequality in the urban areas. The gap between rich and poor will be greater in some urban areas than others. The relative importance of physical and human factors may depend on the severity of economic inequality in the first place.
- Evaluation of the relative importance of human and physical factors in each urban area. For example, in Mumbai the slum of Dharavi is built on marshland meaning it floods during the monsoon. However, it is human processes of rural-urban migration and industrialisation that led to the creation of the slum.
- Students may consider strategies to manage inequalities as an important human factor. They may evaluate the success of these in changing patterns of inequality and this would be a legitimate approach.
- Overall conclusion may highlight the complexity in patterns of economic inequality. These patterns change over time and in

		response to many factors so it is might be considered too complex to assess relative importance. • An overall judgement of the relative importance should be considered. Any conclusion is valid as long as it is supported by the body of the essay. Credit any other valid approach.	

Marking grid for Question 3.5

Level/ Mark Range	Criteria/Descriptor
Level 4 (16–20 marks)	• Detailed evaluative conclusion that is rational and firmly based on knowledge and understanding which is applied to the context of the question (AO2). • Detailed, coherent and relevant analysis and evaluation in the application of knowledge and understanding throughout (AO2). • Full evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Detailed, highly relevant and appropriate knowledge and understanding of place(s) and environments used throughout (AO1). • Full and accurate knowledge and understanding of key concepts and processes throughout (AO1). • Detailed awareness of scale and temporal change which is well integrated where appropriate (AO1).
Level 3 (11–15 marks)	• Clear evaluative conclusion that is based on knowledge and understanding which is applied to the context of the question (AO2). • Generally clear, coherent and relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Generally clear evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Generally clear and relevant knowledge and understanding of place(s) and environments (AO1). • Generally clear and accurate knowledge and understanding of key concepts and processes (AO1). • Generally clear awareness of scale and temporal change which is integrated where appropriate (AO1).
Level 2 (6–10 marks)	• Some sense of an evaluative conclusion partially based upon knowledge and understanding which is applied to the context of the question (AO2). • Some partially relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Some evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Some relevant knowledge and understanding of place(s) and environments which is partially relevant (AO1). • Some knowledge and understanding of key concepts, processes and interactions and change (AO1). • Some awareness of scale and temporal change which is sometimes integrated where appropriate. There may be a few inaccuracies (AO1).
Level 1 (1–5 marks)	• Very limited and/or unsupported evaluative conclusion that is loosely based upon knowledge and understanding which is applied to the context of the question (AO2). • Very limited analysis and evaluation in the application of knowledge and understanding. This lacks clarity and coherence (AO2). • Very limited and rarely logical evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Very limited relevant knowledge and understanding of place(s) and environments (AO1). • Isolated knowledge and understanding of key concepts and processes (AO1). • Very limited awareness of scale and temporal change which is rarely integrated where appropriate. There may be a number of inaccuracies (AO1).
Level 0 (0 marks)	• Nothing worthy of credit.

Qu	Part	Marking guidance	Total marks
04	1	**Outline why salinisation is a problem for agriculture.** Point marked Allow 1 mark per valid point with extra mark(s) for developed points (d). Credit examples where appropriate. For example: Notes for answers • Salinisation is the accumulation of salt within soil (1). It occurs when evapotranspiration is greater than precipitation where the water table is near to the surface (1) (d). The salinity reduces agricultural productivity (1) (d). • In well-drained soils, with sufficient rainfall and/or effective irrigation salts are leached out so increasing salinity does not present a problem (1) (d). • Evaporation of moisture from the surface, results in salts being drawn upwards by capillary action (1) in extreme cases leading to the deposition of salt as a hard crust (1) (d). The concentration of salts in the topsoil affects the roots of crops which are intolerant to salt (1). This causes reduced yields and over time salinisation kills the crops (1) (d). • Salinisation is often the result of over-abstraction of groundwater and the use of irrigation in warm climate (1). Salinisation inhibits osmosis and makes it difficult for plants to absorb soil water (1). The Notes for answers are not exhaustive. Credit any valid points.	**4** **AO1 = 4**
04	2	**Analyse the data shown in Figure 7**. **AO3** – Analysis of the patterns, connections and relationships shown in the hexbin maps. Mark scheme **Level 2 (4–6 marks)** **AO3** – Clear analysis of the quantitative evidence provided which makes appropriate use of data to support. Clear connections between different aspects of the data. **Level 1 (1–3 marks)** **AO3** – Basic analysis of the quantitative evidence provided which makes limited use of data to support. Basic or limited connections between different aspects of the data. Notes for answers The question requires analysis of patterns and relationships shown in the maps in Figure 7.	**6** **AO3 = 6**

		AO3 • Population is increasing in most of the UK. Only the North and West coasts of Scotland show a consistent decrease. Only 5 local authorities have a decrease below –0.6% change. • Much of the growth is driven by migration as much of the country has a natural decrease. For example, in the South-West, all but two areas are experiencing a natural decrease but looking at overall population change all these areas (except one) are showing an increase. This links with internal migration which shows an increase for most areas of the South West. • The areas of highest population change are found in London, the South-East and a cluster running SW-NE from the Bristol Channel. This also appears to be driven by migration as in these areas there is a net increase in either internal migration or international migration. • International migration is highest in and around London. London has the highest rates up to 7.3% increase. Net internal migration is negative in London, between –0.6 and –3.9%. So the positive population change must be accounted for by the high net international migration rate and natural increase. Credit any other valid analysis.	

04	3	**Using Figure 8 and your own knowledge, discuss the possible health impacts of global climate change.** **AO1** – Knowledge and understanding of the health impacts of global climate change. **AO2** – Application of knowledge and understanding to analyse the health impacts of global climate change as shown in **Figure 8**. <u>Mark scheme</u> **Level 3 (7–9 marks)** **AO1** – Demonstrates detailed knowledge and understanding of concepts, processes, interactions and change. These underpin the response throughout. **AO2** – Applies knowledge and understanding appropriately with detail. Connections and relationships between different aspects of study are fully developed with complete relevance. Analysis and evaluation are detailed and well supported with appropriate evidence. A well balanced and coherent argument is presented. **Level 2 (4–6 marks)** **AO1** – Demonstrates some appropriate knowledge and understanding of concepts, processes, interactions and change. These are mostly relevant though there may be some minor inaccuracy. **AO2** – Applies some knowledge and understanding appropriately. Connections and relationships between different aspects of study are emerging/evident with some relevance. Analysis and evaluation are	**9** **AO1 = 4** **AO2 = 5**

		evident and supported with some appropriate evidence. A clear but partial argument is presented. **Level 1 (1–3 marks)** **AO1** – Demonstrates basic/limited knowledge and understanding of concepts, processes, interactions and change. These offer limited relevance with inaccuracy. **AO2** – Applies limited knowledge and understanding. Connections and relationships between different aspects of study are basic with limited relevance. Analysis and evaluation are basic and supported with limited appropriate evidence. A basic argument is presented. <u>Notes for answers</u> The question requires an understanding of the possible health impacts of global climate change. Candidates should apply this understanding to the information shown in Figure 8. **AO1** • Health impacts of global climate change: thermal stress, emergent and changing distribution of vector borne diseases, agricultural productivity and nutritional standards. • Prospects for the global population. Projected distributions. • Critical appraisal of future population-environment relationships. • Role of international agencies and NGOs in promoting health and combating disease at the global scale. **AO2** • Figure 8 shows that even with very small temperature changes there are a diverse range of health impacts. For example, even with changes as little as 0.2 °C, along with water stress resulting in poor crop yields and lower nutritional standards or poor water quality causing water-borne diseases. Increased wildfire risks could cause an increase in respiratory disease. • Analysis of the links between global climate change and health impacts can also be seen in Figure 8 in the increase in deaths from storms. Storms can reduce agricultural productivity leading to increased food insecurity. • Evaluation of the extent to which global climate change might lead to health impacts. Figure 8 suggests that small changes in temperatures might result in increased water availability in the tropics and high altitudes. This may mean that there could be increased yields in these areas, improving nutritional standards. • Analysis of the distribution of health impacts. For example, mid-latitude areas might increase cereal production at 1 °C change, improving nutritional standards and food security whereas yields are likely to decrease in low-latitude regions. • Evaluation of the impact of international agencies and NGOs in combatting the health impacts may also be considered. For example, strategies to overcome food insecurity and increase agricultural productivity.	

		• Alternative possible futures may also be considered by looking at the impact of climate change on health. There may be greater challenges in the future and therefore global health may well suffer. Alternatively, there may be technological advancements which may mean that vector borne diseases can be managed and food production increased despite climate change. Credit any other valid approach.	

04	4	**To what extent is epidemiological transition the most important influence on the global distribution of a non-communicable disease you have studied?** **AO1** – Knowledge and understanding of epidemiological transition. Knowledge and understanding of a non-communicable disease. **AO2** – Applies knowledge and understanding to analyse and evaluate the extent to which epidemiological transition accounts for the distribution of a non-communicable disease. <u>Mark scheme</u> **Level 3 (7–9 marks)** **AO1** – Demonstrates detailed knowledge and understanding of concepts, processes, interactions and change. These underpin the response throughout. **AO2** – Applies knowledge and understanding appropriately with detail. Connections and relationships between different aspects of study are fully developed with complete relevance. Analysis and evaluation are detailed and well supported with appropriate evidence. A well balanced and coherent argument is presented. **Level 2 (4–6 marks)** **AO1** – Demonstrates some appropriate knowledge and understanding of concepts, processes, interactions and change. These are mostly relevant though there may be some minor inaccuracy. **AO2** – Applies some knowledge and understanding appropriately. Connections and relationships between different aspects of study are emerging/evident with some relevance. Analysis and evaluation are evident and supported with some appropriate evidence. A clear but partial argument is presented. **Level 1 (1–3 marks)** **AO1** – Demonstrates basic/limited knowledge and understanding of concepts, processes, interactions and change. These offer limited relevance with inaccuracy. **AO2** – Applies limited knowledge and understanding. Connections and relationships between different aspects of study are basic with limited relevance. Analysis and evaluation are basic and supported with limited appropriate evidence. A basic argument is presented.	**9** **AO1 = 4** **AO2 = 5**

Notes for answers

This question makes connections across two different parts of the specification within the population change section – the concept of epidemiological transition and the study of a non-communicable disease. Likely choices are lung cancer, coronary heart disease and asthma. Max Low Level 2 for responses only considering a biologically transmitted disease.

AO1

- Global patterns of health, mortality and morbidity.
- Economic and social development and the epidemiological transition.
- Demographic transition.
- The global prevalence and distribution of one specified non-communicable disease (NCD), eg a specific type of cancer, coronary heart disease, asthma.
- The links between the non-communicable disease and the physical and socio-economic environment including impacts of lifestyles. Impact on health and well-being.
- Management and mitigation strategies for the non-communicable disease.
- Role of international agencies and NGOs in promoting health and combating disease at the global scale.

AO2

- Evaluation of the idea of epidemiological transition and its links to demographic transition. The links between the stages of epidemiological transition and development.
- The extent to which the model of epidemiological transition can be applied and its applicability to current global health patterns.
- Assessment of the evidence supporting epidemiological transition in relation to patterns of health, morbidity and mortality.
- Evaluation of the extent to which the NCD fits into the concept of epidemiological transition. For example, lung cancer is typical of stage 3 in epidemiological transition, where there is an increase in life expectancy to 60 but typically poor lifestyles with addictions. It is also still a leading cause of death in stage 4.
- The extent to which the global distribution of the NCD represents different stages of epidemiological transitions. Lung cancer is highest in southern Europe, which is stage 4. It also shows higher rates in China, fitting stage 3. Lowest rates are in sub-Saharan Africa again supporting the model.
- However, lung cancer is predominantly spread by tobacco use and recently this has become more widespread in LICs, overtaking many HICs. It is likely that this might affect the speed and stages of epidemiological transition.
- Some candidates may evaluate management and mitigation strategies and the impact this has on the distribution.

		• They may consider other factors that explain the distribution of the NCD. This is a legitimate approach considered relative to the idea of epidemiological transition. • Alternative futures in the distribution of the NCD and epidemiological transition may also be considered. • Conclusion should consider the extent to which epidemiological transition accounts for the distribution of the NCD. Any conclusion is valid as long as it supports the preceding content. Credit any other valid approach.	

04	5	**Assess the relative importance of the physical environment and socio-economic factors in determining the health characteristics of a local area you have studied.** **AO1** – Knowledge and understanding of a specified local area to illustrate and analyse the relationship between place and health. **AO2** – Application of knowledge and understanding to assess the relative importance of the physical environment and socio-economic factors in determining the health of the local area. <u>Notes for answers</u> The question requires students to consider the relative importance in different factors in determining the health characteristics of a local area. The local area should be small-scale. If more than one local area considered, credit the best one. **AO1** • Knowledge and understanding of physical and human factors affecting health. • Key elements in the physical environment: climate, soils, resource distributions including water supply. • Key population parameters: distribution, density, numbers, change. • The relationship between environment variables eg climate, topography (drainage) and incidence of disease. Air quality and health. Water quality and health. • Case study of a specified local area to illustrate and analyse the relationship between place and health related to its physical environment, socio-economic character and the experience and attitudes of its populations. • Critical appraisal of future population-environment relationships. **AO2** • Analysis of the physical environment in the local area and its impact on the health characteristics. For example, access to green spaces and the benefits to mental health. Sunshine hours and malignant melanoma.	**20** **AO1 = 10** **AO2 = 10**

		• Evaluation of the links between the physical environment and health in the local area. Studies show that living in areas surrounded by green area leads to a 5% improvement in short-term memory. • In urban areas, the physical environment can relate to aspects of the built environment and impacts on health. • Analysis of the socio-economic factors in the local area that impact on the health characteristics. For example, deprivation and obesity and smoking prevalence. • Evaluation of the links between socio-economic factors and health in the local area. Deprivation has a significant effect with higher levels of hospital admissions for drug and alcohol abuse. • The extent to which values and attitudes of the population have an impact on health characteristics. • The extent to which temporal change and spatial variation in the health characteristics, are influenced by the physical environment and socio-economic factors. • Students may consider the impact of management and mitigation strategies on the health of the population in the local area. • Critical assessment of alternative futures in the health characteristics in the local area may be considered. • Overall conclusion may highlight the complexity in the relationship between human and physical factors. These patterns change over time and in response to many factors so it might be considered too complex to assess relative importance. • Any conclusion is valid as long as it is supported by the preceding content. Credit any other valid approach.	

Marking grid for Question 4.5

Level/ Mark Range	Criteria/Descriptor
Level 4 (16–20 marks)	• Detailed evaluative conclusion that is rational and firmly based on knowledge and understanding which is applied to the context of the question (AO2). • Detailed, coherent and relevant analysis and evaluation in the application of knowledge and understanding throughout (AO2). • Full evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Detailed, highly relevant and appropriate knowledge and understanding of place(s) and environments used throughout (AO1). • Full and accurate knowledge and understanding of key concepts and processes throughout (AO1). • Detailed awareness of scale and temporal change which is well integrated where appropriate (AO1).
Level 3 (11–15 marks)	• Clear evaluative conclusion that is based on knowledge and understanding which is applied to the context of the question (AO2). • Generally clear, coherent and relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Generally clear evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Generally clear and relevant knowledge and understanding of place(s) and environments (AO1). • Generally clear and accurate knowledge and understanding of key concepts and processes (AO1). • Generally clear awareness of scale and temporal change which is integrated where appropriate (AO1).
Level 2 (6–10 marks)	• Some sense of an evaluative conclusion partially based upon knowledge and understanding which is applied to the context of the question (AO2). • Some partially relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Some evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Some relevant knowledge and understanding of place(s) and environments which is partially relevant (AO1). • Some knowledge and understanding of key concepts, processes and interactions and change (AO1). • Some awareness of scale and temporal change which is sometimes integrated where appropriate. There may be a few inaccuracies (AO1).
Level 1 (1–5 marks)	• Very limited and/or unsupported evaluative conclusion that is loosely based upon knowledge and understanding which is applied to the context of the question (AO2). • Very limited analysis and evaluation in the application of knowledge and understanding. This lacks clarity and coherence (AO2). • Very limited and rarely logical evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Very limited relevant knowledge and understanding of place(s) and environments (AO1). • Isolated knowledge and understanding of key concepts and processes (AO1). • Very limited awareness of scale and temporal change which is rarely integrated where appropriate. There may be a number of inaccuracies (AO1).
Level 0 (0 marks)	• Nothing worthy of credit.

Qu	Part	Marking guidance	Total marks
05	1	**Outline the concept of the resource frontier.** Point marked Allow 1 mark per valid point with extra mark(s) for developed points (d). Credit examples where appropriate. Notes for answers • A peripheral /new area of a country or territory that attracts exploration (1) with subsequent development and production of resources for the first time (1) (d). These areas are often opened up in response to more accessible locations being exhausted (1) (d). • The resource frontier is often an undeveloped area so there may be conflict over exploitation of wilderness areas (1). For example, indigenous tribes and conservation groups protesting against drilling in the ANWR in Northern Alaska (1) (d). • As easily accessible and low-cost resources become depleted, the search for new resources enters less accessible locations (1). These new resources frontiers have been made possible by advances in transport and technology (1). For example, the trans-Alaskan oil pipeline opened up the resource frontier of Prudhoe Bay (1) (d). The notes for answers are not exhaustive. Credit any valid points.	**4** **AO1 = 4**
05	2	**Analyse the data shown in Figure 9a and Figure 9b.** **AO3** – Analysis of the temporal change in levels of drought and the energy mix of Montana Mark scheme **Level 2 (4–6 marks)** **AO3** – Clear analysis and interpretation of the quantitative evidence provided, which makes appropriate use of data in support. Clear connection(s) between different aspects of the data and evidence. **Level 1 (1–3 marks)** **AO3** – Basic analysis and interpretation of the quantitative evidence provided, which makes limited use of data and evidence in support. Basic connection(s) between different aspects of the data and evidence. Notes for answers The question requires analysis of the temporal change in drought levels and energy mix in Montana. Students should seek connections between and within the data sets.	**6** **AO3 = 6**

		AO3 • Figure 9a shows that there was some level of drought present from May 2017 through to January 2018. From late August until mid-September almost 100% of the land area was affected at some level. • The drought peaked in mid-September with almost 50% of the land area affected by extreme and exceptional drought. Exceptional drought began in mid-July and by September affected almost 25% of the land area. • Figure 9b shows that the total energy generated fluctuates throughout the period on the graph. The highest amount generated was 2.75 billion kilowatt hours in late 2013, late 2015 and late 2017. The lowest amount was 1.7 billion kw hours in mid-2013. • The sources of energy used to generate the electricity also varies dominated by two sources, coal and hydro. The amount of hydro fluctuates by as much as 1 billion kw hours. Hydro makes up most of the mix when total hours are lower. • There is a clear link between Figure 9a and Figure 9b as we can see the amount of hydro used to generate electricity reduces rapidly around mid-2017 when 50% of the land is affected by drought. There is also a peak in total electricity at this time, and larger amounts of coal are used as the hydro reduces. Credit any other valid analysis.	

05	3	**Using Figure 10a, Figure 10b and your own knowledge, discuss why there may be conflict between resource security and human welfare.** **AO1** – Knowledge and understanding of the relationship between resource security and human welfare. **AO2** – Applies knowledge and understanding to assess the extent to which there might be conflicts between resource security and human welfare as shown in Figure 10a and Figure 10b. <u>Mark scheme</u> **Level 3 (7–9 marks)** **AO1** – Demonstrates detailed knowledge and understanding of concepts, processes, interactions and change. These underpin the response throughout. **AO2** – Applies knowledge and understanding appropriately with detail. Connections and relationships between different aspects of study are fully developed with complete relevance. Analysis and evaluation are detailed and well supported with appropriate evidence. **Level 2 (4–6 marks)** **AO1** – Demonstrates clear knowledge and understanding of concepts, processes, interactions and change. These are mostly relevant though there may be some minor inaccuracy.	**9** **AO1 = 4** **AO2 = 5**

AO2 – Applies clear knowledge and understanding appropriately. Connections and relationships between different aspects of study are evident with some relevance. Analysis and evaluation are evident and supported with clear and appropriate evidence.

Level 1 (1–3 marks)
AO1 – Demonstrates basic knowledge and understanding of concepts, processes, interactions and change. This offers limited relevance with inaccuracy.
AO2 – Applies limited knowledge and understanding. Connections and relationships between different aspects of study are basic with limited relevance. Analysis and evaluation are basic and supported with limited appropriate evidence.

Notes for answers
The question requires an understanding of the relationship between resource security and human welfare. The specification requires study of this in relation to a specified resource. There is no requirement to include this in this question but credit resources other than coal where appropriate. The focus of the response should be a critical assessment of the conflicts that can arise as a result of resource developments.

AO1
- Knowledge and understanding of a case study of either water or energy or mineral ore resource issues in a global or specified regional setting and the relationship between resource security and human welfare.
- Knowledge and understanding of the environmental impacts of a major resource development – oil, coal or gas fields.
- Knowledge and understanding of primary sources of energy.
- Knowledge and understanding of sustainability issues associated with energy production – acid rain, enhanced greenhouse effect, nuclear waste and energy conservation.
- Alternative resource futures – technological advancements, environmental and political developments.
- The geopolitics of resource development.

AO2
- Analysis of Figure 10a to assess resource security and human welfare suggests that the coal mine will give the UK and Europe more energy security, as they will have to import less.
- There is also a benefit to local people as there are more than 500 jobs, improving welfare as the local area of Whitehaven suffers from deprivation.
- Analysis of Figure 10b to assess resource security and human welfare suggests that due to the environmental impacts of coal, there may be less resource security – 'no future in coal' as globally there is a shift away from fossil fuels.
- Figure 10b suggests that some people feel that there would be more job security in greener energy. This suggests there is a significant level of conflict in Cumbria over the proposed coal mine.

		• Analysis of the environmental impacts of the coal mine proposal in Figure 10a in relation to human welfare. Enhanced greenhouse effect, scarring on the landscape. • Students might consider the scale of the conflict – the coal mine will provide jobs for local people but the environment impacts of burning the mined coal might be felt globally. • Critical discussion might consider the complexities in the relationship between resource security and human welfare. • They may consider the subjectivity of Figure 10a. This would be a creditworthy point. Figure 10a is produced by West Cumbria Mining who will make huge profits out of the mine. • Students should come to a conclusion using the evidence. Any conclusion is valid as long as it supports the content of the response. Credit any other valid assessment.	

05	4	**With reference to <u>one</u> mineral ore, assess the relationship between demand for the ore and the end uses of the ore.** **AO1** – Knowledge and understanding of the end uses of the ore. Knowledge and understanding of the components of demand for ore. **AO2** – Application of knowledge and understanding to evaluate the extent of the relationship between demand for the ore and the end uses of the ore. <u>Mark scheme</u> **Level 3 (7–9 marks)** **AO1** – Demonstrates detailed knowledge and understanding of concepts, processes, interactions and change. These underpin the response throughout. **AO2** – Applies knowledge and understanding appropriately with detail. Connections and relationships between different aspects of study are fully developed with complete relevance. Analysis and evaluation are detailed and well supported with appropriate evidence. **Level 2 (4–6 marks)** **AO1** – Demonstrates clear knowledge and understanding of concepts, processes, interactions and change. These are mostly relevant though there may be some minor inaccuracy. **AO2** – Applies clear knowledge and understanding appropriately. Connections and relationships between different aspects of study are evident with some relevance. Analysis and evaluation are evident and supported with clear and appropriate evidence. **Level 1 (1–3 marks)** **AO1** – Demonstrates basic knowledge and understanding of concepts, processes, interactions and change. This offers limited relevance with inaccuracy. **AO2** – Applies limited knowledge and understanding. Connections and relationships between different aspects of study are basic with limited relevance. Analysis and evaluation are basic and supported with limited appropriate evidence. <u>Notes for answers</u> The question requires links to be made between the demand for the ore and the end uses of the ore. They should focus their response on one mineral ore. Likely choices are copper or iron. If more than one mineral ore chosen then credit best response. Coal is not a mineral ore and a response that only discusses this would be limited to level 1. **AO1** • Knowledge and understanding of the sources of the specified ore and the distribution of reserves/resources. • End uses of the ore. • Components of demand for ore. • Role of specified ore in global commerce and industry.	**9** **AO1 = 4** **AO2 = 5**

		• Knowledge and understanding of the mineral ore trade and the role of TNCs. • Knowledge and understanding of mineral security. • Factors affecting the demand and supply of mineral ores. **AO2** • Analysis of the factors affecting demand for mineral ores – industrial and manufacturing diversity and financial strength. The largest importers of ore minerals tend to be countries with extensive agricultural and industrial bases. • Temporal and spatial change in the consumption of, and demand for mineral ores. Over the course of the twentieth century increasing demand and consumption in China. China has overtaken US as world's largest consumer at 42% of global consumption. • Analysis of the factors affecting the end uses of the ore. Changing technological advancements. Copper has a very diverse range of end-uses. • Evaluation of the extent to which sustainability issues impact end uses. Copper becomes less profitable due the increasing waste obtained and declining quality of ore grade. • Evaluation of the role of TNCs in changing demand and end-uses. TNCs dominate the trade in mineral ores and therefore control over end use. • Evaluation of the link between demand and end-use. Copper is key raw material – the third most widely used metal. However, some traditional end-uses are replacing copper with other materials, for example fibre-optic cables. • The extent to which changing demand is affecting the end-uses. Increasing global population and wealth is a key driver in demand. However, some of this demand can be offset by using recycled copper. About 18% of new production uses recycled copper. • Students should come to a conclusion as to the extent to which there is a relationship between demand for a mineral ore and end-uses. Any conclusion is valid as long as it is supported by the preceding content. Credit any other valid approach.	

05	5	**'Strategies to increase water supply can never be sustainable as they always result in negative consequences somewhere else.'** **To what extent do you agree with this view?** **AO1** – Knowledge and understanding of strategies to increase water supply. **AO2** – Application of knowledge and understanding to assess the extent to which strategies to increase water supplies are sustainable. <u>Notes for answers</u> The question links different parts of the water security section. They are asked to apply knowledge of sustainability issues of water to strategies to increase water supplies. The question is open-ended and responses will depend on the water supply strategies chosen. The negative consequences could be environmental, political or socio-economic and be considered at a range of scales. **AO1** • Strategies used to increase water supply such as dams, reservoirs, water transfer schemes, desalinisation. • Environmental impacts of strategies used to increase supply. • Environmental impacts of a major water supply scheme incorporating a major dam and/or barrage and associated distribution networks. • Sustainability issues associated with water management: virtual water trade, conservation, recycling, 'greywater' and groundwater management. • Geopolitics of water supply and distribution. • Knowledge and understanding of water conflicts at different scales – local, national, international. **AO2** • Analysis of the factors leading to the implementation of water supply schemes. Consideration of the water demand and supply issues. • Evaluation of the extent to which strategies to increase water supply are successful in meeting demand. • Evaluation of the sustainability of the water supply scheme. River diversion in the former Soviet Union successfully transferred water to enable mass cotton production in Uzbekistan but at the expense of the Aral Sea which has shrunk by 90%. • Analysis of the link between water shortages and conflict. Consideration of the extent to which water supply schemes might resolve conflicts and therefore be considered sustainable. • The link between strategies used to increase water supply and the possibility of conflict. Any strategy employed to increase supply in one area is likely to have an impact on neighbouring areas. For example, the Aswan Dam affects water supplies downstream, meaning farmers have to use fertilisers.	**20** **AO1 = 10** **AO2 = 10**

		• Evaluation of the role played by geopolitics may be considered. Water conflicts at all scales are likely to increase as water shortages increase as a result of climate change and population pressure. • Temporal change might be considered looking at impacts of water supply strategies over time. • They may also consider the consequences at a variety of scales from local through to global. For example, desalinisation might lead to global climate change from increased greenhouse emissions, whereas a water transfer scheme may cause regional conflicts. • Alternative futures may also be considered. Climate change may have an impact on water security across the globe. In some areas there will be greater need for water supply strategies. • Responses should come to a conclusion as to the extent to which they agree with the statement. Any conclusion is valid as long as it is supported by the preceding content. Credit any other valid approach.	

Marking grid for question 5.5

Level/ Mark Range	Criteria/Descriptor
Level 4 (16–20 marks)	• Detailed evaluative conclusion that is rational and firmly based on knowledge and understanding which is applied to the context of the question (AO2). • Detailed, coherent and relevant analysis and evaluation in the application of knowledge and understanding throughout (AO2). • Full evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Detailed, highly relevant and appropriate knowledge and understanding of place(s) and environments used throughout (AO1). • Full and accurate knowledge and understanding of key concepts and processes throughout (AO1). • Detailed awareness of scale and temporal change which is well integrated where appropriate (AO1).
Level 3 (11–15 marks)	• Clear evaluative conclusion that is based on knowledge and understanding which is applied to the context of the question (AO2). • Generally clear, coherent and relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Generally clear evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Generally clear and relevant knowledge and understanding of place(s) and environments (AO1). • Generally clear and accurate knowledge and understanding of key concepts and processes (AO1). • Generally clear awareness of scale and temporal change which is integrated where appropriate (AO1).
Level 2 (6–10 marks)	• Some sense of an evaluative conclusion partially based upon knowledge and understanding which is applied to the context of the question (AO2). • Some partially relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Some evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Some relevant knowledge and understanding of place(s) and environments which is partially relevant (AO1). • Some knowledge and understanding of key concepts, processes and interactions and change (AO1). • Some awareness of scale and temporal change which is sometimes integrated where appropriate. There may be a few inaccuracies (AO1).
Level 1 (1–5 marks)	• Very limited and/or unsupported evaluative conclusion that is loosely based upon knowledge and understanding which is applied to the context of the question (AO2). • Very limited analysis and evaluation in the application of knowledge and understanding. This lacks clarity and coherence (AO2). • Very limited and rarely logical evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Very limited relevant knowledge and understanding of place(s) and environments (AO1). • Isolated knowledge and understanding of key concepts and processes (AO1). • Very limited awareness of scale and temporal change which is rarely integrated where appropriate. There may be a number of inaccuracies (AO1).
Level 0 (0 marks)	• Nothing worthy of credit.