GCSE
GEOGRAPHY
8035/2

Paper 2 Challenges in the Human Environment

Mark scheme

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Version: 1.0 Final

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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

Point marked questions marking instructions

The mark scheme will state the correct answer or a range of possible answers, although these may not be exhaustive. It may indicate how a second mark is awarded for a second point or developed idea. It may give an indication of unacceptable answers. Each mark should be shown by placing a tick where credit is given. The number of ticks must equal the mark awarded. Do not use crosses to indicate answers that are incorrect.

Level of response marking instructions

Level of response mark schemes are broken down into levels, each of which has a descriptor. The descriptor is linked to the assessment objective(s) being addressed. The descriptor for the level shows the average performance for the 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. You should read the whole answer before awarding marks on levels response questions.

Step 1 Determine a level

Descriptors for the level indicate the different qualities that might be seen in the student's answer for that level. 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 2 with a small amount of Level 3 material it would be placed in Level 2 but be awarded a mark near the top of the level because of the Level 3 content. For instance, in a 9 mark question with three levels of response, an answer may demonstrate thorough knowledge and understanding (AO1 and AO2) but fail to respond to command words such as assess or evaluate (AO3). The script could still access Level 2 marks. Note that the mark scheme is not progressive in the sense that students don't have to fulfil all the requirements of Level 1 in order to access Level 2.

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 also help. There will generally 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.

Assessment of spelling, punctuation, grammar and use of specialist terminology (SPaG)

Accuracy of spelling, punctuation, grammar and the use of specialist terminology will be assessed via the indicated 9 mark questions. In each of these questions, three marks are allocated for SPaG as follows:

- **High performance** – 3 marks
- **Intermediate performance** – 2 marks
- **Threshold performance** – 1 mark

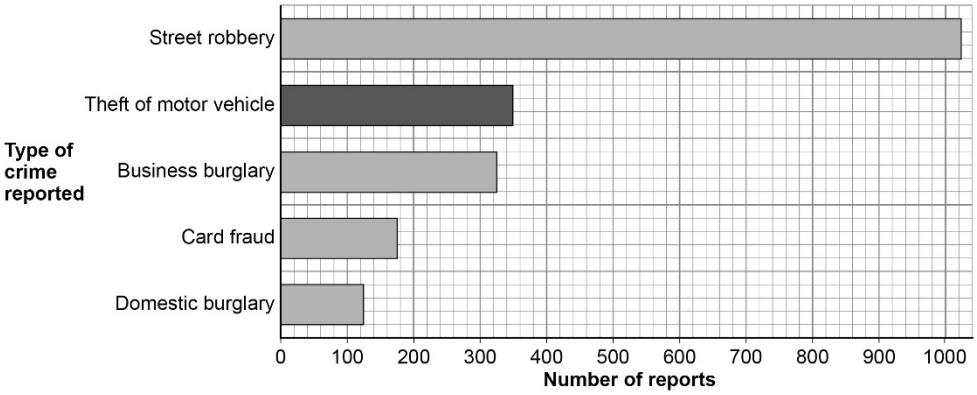
Responses with SPaG marks that gain a mark of 0 for the content/skills of the question can still be awarded SPaG marks if the response is judged to be a genuine attempt to answer the question.

General guidance

- Mark schemes should be applied positively. Examiners should look for qualities to reward rather than faults to penalise. They are looking to find credit in each response they mark. Unless the mark scheme specifically states, candidates must never lose marks for incorrect answers.
- The full range of marks should be used. Examiners should always award full marks if deserved, ie if the answer matches the mark scheme.
- 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.
- Do NOT add ticks to level-marked questions – use the highlight tool/brackets to signify what is relevant.
- Sometimes there are specific "triggers" in the mark scheme that enable higher level marks to be awarded. For instance, an example or case study may be required for Level 3 if it is stated within the question.
- Where a source, such as a photograph or map, is provided as a stimulus it should be used if requested in the question, but credit can often be given for inferred as well as direct use of the source.
- Always be consistent – accept the guidelines given in the mark scheme and apply them to every script.
- If necessary make comments to support the level awarded and to help clarify a decision you have made.
- Examiners should revisit standardised script answers as they apply the mark scheme in order to confirm that the level and the mark allocated is appropriate to the response provided.
- Mark all answers written on the examination paper.

Section A

Qu	Pt	Marking Guidance	Total marks
01	1	**Give one reason for the growth of megacities in LIC/NEEs.** • (High rates of) rural-urban migration. Accept rural-urban migration without rate. • (High rates of) natural increase (in cities). • Urban and industrial development is often concentrated in one or two single large cities. • Tendency towards primate cities in many LICs/NEEs which become megacities. • Accept any statement relating to urbanisation or natural increase. Credit any lengthier explanation of the above if clearly relevant to LIC/NEE cities. AO1 – 1 mark	1
01	2	**Calculate the mean size of the cities shown in Figure 1. Answer to one decimal place.** One mark for working, one for correct answer. Allow working mark even if no answer generated but showing awareness of how to calculate the mean. Two marks if correct answer given with no apparent working. Allow one mark if given to 2 dp, i.e. 28.06 **28.1** AO4 – 2 marks	2

01	3	**Complete Figure 2 using the following data.** One mark for correctly drawn bar. Width can be ignored. Does not need to be shaded/ shaded correctly.  AO4 – 1 mark	1

01	4	**Approximately how much more frequent is street robbery than business burglary?** One mark for the correct answer. **B.** 3 times No credit if two or more statements are shaded. AO4 – 1 mark	1

01	5	**Outline one reason why reducing crime is a challenge in some LIC/NEE cities.** One mark for a basic statement, eg • High levels of poverty / unemployment / social exclusion (1) • Gangs can control areas of informal settlements (1) • Many distrust the police because of corruption (1) Two marks for a developed idea, eg • High levels of poverty / unemployment / social exclusion (1) which means that people may resort to crime to survive / because they feel excluded from society (d) (1) • Gangs can control areas of informal settlements (1) and they are hard to eradicate because of the control they exert over people's lives (d) (1) • Many distrust the police because of corruption (1) which means they find it hard to enforce the law (d) (1) Credit any reasonable suggestion linked to crime. AO1 – 2 marks	2

01	6	**To what extent has urban growth created social opportunities? Use Figure 3 and a LIC/NEE example you have studied.** **Level 3 (Detailed) – 5–6 marks** AO2 – Shows detailed understanding of the relationship between urban growth and the opportunities offered. AO3 – Demonstrates thorough application of knowledge and understanding to offer analysis of the figure and another example. **Level 2 (Clear) – 3–4 marks** AO2 – Shows clear understanding of the relationship between urban growth and the opportunities offered. AO3 – Demonstrates some application of knowledge and understanding by analysis of the figure and / or another example. **Level 1 (Basic) – 1–2 marks** AO2 – Shows limited understanding of the relationship between urban growth and the opportunities offered. . AO3 – Demonstrates limited application of knowledge and analysis of the figure and / or another example. **0 marks** No relevant content. • **Level 3 responses** will cover the figure and a named example with well developed geographical understanding and provide a considered analysis of the link between growth and opportunities. • **Level 2 responses** will show reasonable understanding of the link between growth and opportunities using the figure and an example / clear geographical understanding or more considered analysis for just the figure or example used.	6

		• **Level 1 responses** will show simple understanding of the link between growth and opportunities using the figure and / or a named example / simple geographical knowledge. • **Max L2** if **Fig 3** or own example / understanding only. <u>Indicative content</u> • The specification requires a case study of a major city in a LIC/NEE and states 'health and education' as opportunities created by urban growth. • Discussion should show an awareness of the extent to which these opportunities exist for inhabitants. • Answers should make use of both **Figure 3** and appropriate geography, including an example, balance is not required. • Reference to **Figure 3** may be inferred even if not explicitly stated through such comments as: the informal nature of some education, the existence of schooling and schools even if small. • Credit reference to volunteer teachers as this is stated in the stem. • Credit reference to economic opportunities such as employment prospects even if informal eg 85% in Dharavi, only if then linked to improvement of social well-being such as purchase of better food, housing, education. • Content may vary considerably depending on the case study used by candidates but may focus on education due to the figure. • Children can attend school when schools were not available in the rural areas from which they have migrated, eg 68% secondary education in Lagos vs 60% primary in rural areas in the N. • Many projects to improve life in urban areas will have an educational element eg the floating school in Makoko, Lagos. • Job training and vocational skills may also be provided for adults such as in the Favela Bairro scheme. • Water supply will be better in urban areas eg 75% in Lagos vs 42% in rural Nigeria which brings the social benefit of reduced incidence of water borne diseases. • Other social opportunities such as a strong sense of community in Dharavi, Mumbai and better housing and therefore quality of life in more established informal settlements. • Many informal settlements become part of the urban fabric over time and develop community and social activities in doing so, sometimes referred to as 'slums of hope'. • Extent of opportunities may be tempered by level of access eg Makoko floating school can only accommodate 60 children at a time in an area with 85 000 population or quality of access eg figure shows small scale school next to the road, run by volunteers who may lack knowledge and skills. • Social opportunities provide may not always be suitable eg the vocational training in Favela Bairro should have been preceded by literacy training to have greater success. No credit for discussion of challenges. No credit for discussion of opportunities other than social. AO2 – 3 marks	

		AO3 – 3 marks	

01	7	**Which route would you use to travel south west from the bike park?** One mark for the correct answer. **C** – Mill Lane Bridge No credit if two or more answers are shaded. AO4 – 1 mark	1

01	8	**How long would it take to cycle from the bike park to Evington Library?** One mark for the correct answer. **30** minutes No credit if working correct but answer is wrong. AO4 – 1 mark	1

01	9	**Suggest how urban transport strategies can be used to reduce traffic congestion. Use Figure 4 and your own understanding.**	4

Level	Marks	Description
2 (Clear)	3–4	AO2 – Shows clear understanding of urban transport strategies and reduction in traffic congestion. AO3 – Applies knowledge and understanding to interpret **Figure 4** effectively and offers development to explain the link between strategies and reduction in congestion.
1 (Basic)	1–2	AO2 – Shows limited understanding of urban transport strategies and reduction in traffic congestion. AO3 – Applies knowledge and understanding to **Figure 4** OR own understanding to begin to explain the link between strategies and reduction in congestion.
	0	No relevant content.

- **Level 2 responses** will apply geographical knowledge and understanding in combination with the figure to present a reasoned explanation.
- **Level 1 responses** will be simplistic or simply assert a cause / effect link.
- **Max L1** for figure or own understanding only.
- **Max L1 if cycling is the only strategy discussed**

<u>Indicative content</u>

- Answers should apply knowledge and understanding to **Figure 4** which can be explicit through naming routes on the map or implicit through reference to promoting cycling or cycle hire schemes.
- Development need not be through named places but use of an example is likely to add clarity. Development may also be found in explanation of the process of congestion reduction.
- Much will depend on the examples studied, which need not be UK based. Likely examples are Freiburg, Singapore, Utrecht, Bristol, London. LIC/NEE would also be valid.
- Credit any scheme which reduces congestion eg public transport, Oyster cards, park and ride, bus priority lanes, congestion zones, quota schemes, car sharing, electronic road pricing, flexible working times.

Figure 4 eg:

- Publicising cycle routes / showing the short times required / simple and easy to understand maps will remove some of the perceived obstacles to cycling so that more people choose it instead of a car.
- Providing a 'bike park' in the centre suggests bikes will be secure and therefore encourages use as people don't worry about theft.

Own understanding eg:

		• Comments such as the above would then need to be linked to how they reduce congestion in terms of reduction of numbers of vehicles at any one time and speeding up traffic flow. • Development of any valid example. No credit for other benefits of schemes eg reduction in air pollution, making cities more 'liveable'. AO2 – 2 marks AO3 – 2 marks	

01	10	**Outline one way in which a UK city you have studied is important in the UK.** One mark for a basic statement, eg • Birmingham has 5 universities (1) • Bristol has the largest concentration of silicon chip industries outside California (1) • London is the UK's capital (1) Two marks for a developed idea, eg • Birmingham has 5 universities (1) which makes it an important centre for education in the UK (d) (1) • Bristol has the largest concentration of silicon chip industries outside California (1) so it is important to develop the UK's own computer industries (d) (1) • London is the UK's capital (1) so the government of the whole country is run from here (d) (1) Much will depend on the example studied. Credit any reasonable suggestion linked to UK importance. No credit for non UK city. AO1 – 2 marks	2

01	11	**'Urban change in the UK has created more economic opportunities than social opportunities.' Evaluate this statement. Use a UK city you have studied.**	9

Level	Marks	Description
3 (Detailed)	7–9	AO1 – Demonstrates detailed knowledge of places and processes in urban environments. AO2 – Shows a thorough understanding of how urban growth in a UK city creates economic and social opportunities. AO3 – Demonstrates thorough application of knowledge and understanding to make a thorough evaluation of the relative merit of social / economic opportunities in a UK city.
2 (Clear)	4–6	AO1 – Demonstrates reasonable knowledge of places and processes in urban environments. AO2 – Shows clear understanding of how urban growth in a UK city creates economic and social opportunities. AO3 – Demonstrates reasonable application of knowledge and understanding to make a partial evaluation of the relative merit of social / economic opportunities in a UK city.
1 (Basic)	1–3	AO1 – Demonstrates limited knowledge of places and processes in urban environments. AO2 – Shows limited understanding of how urban growth in a UK city creates economic and social opportunities. AO3 – Demonstrates limited application of knowledge and understanding to make a limited evaluation of the relative merit of social / economic opportunities in a UK city.
	0	No relevant content.

- **Level 3 responses** will provide a considered evaluation with conclusion of the relative merits of the opportunities, supported with precise knowledge.
- **Level 2 responses** will give a reasoned evaluation of the opportunities supported with either precise or generically accurate knowledge.
- **Level 1 responses** will show simple understanding of the opportunities that arise and may state relative merits without support.
- **Max level 2** if no comment on the relative merits.
- **Max Level 2** if no named city or named city not UK**.**

<u>Indicative content</u>

- Opportunities will vary greatly depending on chosen case study, accept anything relevant to the named city even if generic. Answers must refer to a named UK city to access Level 3.

		• Likely examples are London, Bristol, Liverpool, Birmingham. • The command 'evaluate' along with 'more than' requires some judgement of the size or merits of opportunities associated with a UK city. Balance between social and economic is not required. • **Social opportunities** include: recreation and entertainment eg Albert Dock and Echo Arena, Liverpool; shopping and leisure eg Cribbs Causeway and Cabot Circus, Bristol; cultural enrichment and diversity eg Indian restaurants in the 'Balti Triangle', Birmingham; vibrant arts and culture scenes eg Shoreditch, London. • **Economic opportunities** include: New business parks eg Liverpool Science Park; expansion of creative industries eg Aardman animations, Bristol; new hi-tech industries eg Silicon chip and associated industries such as Hewlett Packard nr. Bristol; expanding finance and service industries eg Canary Wharf, London; the largest number of businesses in a city outside London are found in Birmingham in a variety of sectors. • Allow for candidates not drawing a distinction between economic and social eg Employment (economic) creates jobs and more income so increases living standards (social) and therefore look to credit economic and social on the candidates behalf if they don't draw attention to them separately. • Credit any opinion in evaluation, it is perfectly possible to argue either way. Also credit an opinion that doesn't decide for one or the other, provided there has been attempt to weigh up. • Evaluation may also cover the idea that the relative extent of opportunities may vary between groups of people in the city and that some may have benefitted more than others eg the young and more skilled / educated may benefit from new employment but those who lost their jobs in traditional industries may not. Only those with disposable income may see the benefits of new recreation and shopping opportunities. No credit for any opportunities other than social or economic. No credit for challenges. AO1 – 3 marks AO2 – 3 marks AO3 – 3 marks	
		Spelling, punctuation and grammar (SPaG) **Responses with SPaG marks that gain a mark of 0 for the content/skills of the question can still be awarded SPaG marks if the response is judged to be a genuine attempt to answer the question.** **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. **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.	**3** **2**

		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. **No marks awarded** • The learner writes nothing. • The learner's response does not relate to the question. • The learner's achievement in SPaG does not reach the threshold performance level, for example errors in spelling, punctuation and grammar severely hinder meaning.	**1** **0**

Section B

<table>
<tr><th>Qu</th><th>Pt</th><th>Marking Guidance</th><th>Total marks</th></tr>
<tr><td>02</td><td>1</td><td>Using Figure 5 give the direction from the Southampton Science Park in grid square 4018 to the university in grid square 4215.

One mark for the correct answer.

C – South East

No credit if two or more statements are shaded.

AO4 – 1 mark</td><td>1</td></tr>
<tr><td>02</td><td>2</td><td>Using Figure 5, complete the table to give two pieces of map evidence showing why the site in grid square 4018 is a good location for the science park. An example has been completed for you.

<table>
<tr><th>Evidence</th><th>Grid square</th></tr>
<tr><td>Near university</td><td>4215</td></tr>
<tr><td>Motorways/motorway junctions</td><td>3716,3817,3917,4017,4117,4217,4218</td></tr>
<tr><td>Main roads</td><td>4018,4118</td></tr>
<tr><td>Train stations/lines</td><td>4315,4416</td></tr>
<tr><td>Airport</td><td>4516,4517</td></tr>
<tr><td>Areas of housing,</td><td>4117, 4116, 4418, 3816</td></tr>
<tr><td>Space to expand</td><td>4018</td></tr>
<tr><td>Pleasant environment/ woodland</td><td>3918,4118</td></tr>
<tr><td>Outskirts/Edge (of City)</td><td>3918, 4118, 4218</td></tr>
</table>

Answer requires 4 figure grid references but accept 6 figure grid references if correct or if the square is correctly located.

Grid square and evidence must match.

Credit other relevant evidence and grid squares not listed above.

AO4 – 2 marks</td><td>2</td></tr>
</table>

02	3	**To what extent are modern industrial developments environmentally sustainable? Use Figure 6 and your own understanding.**	6

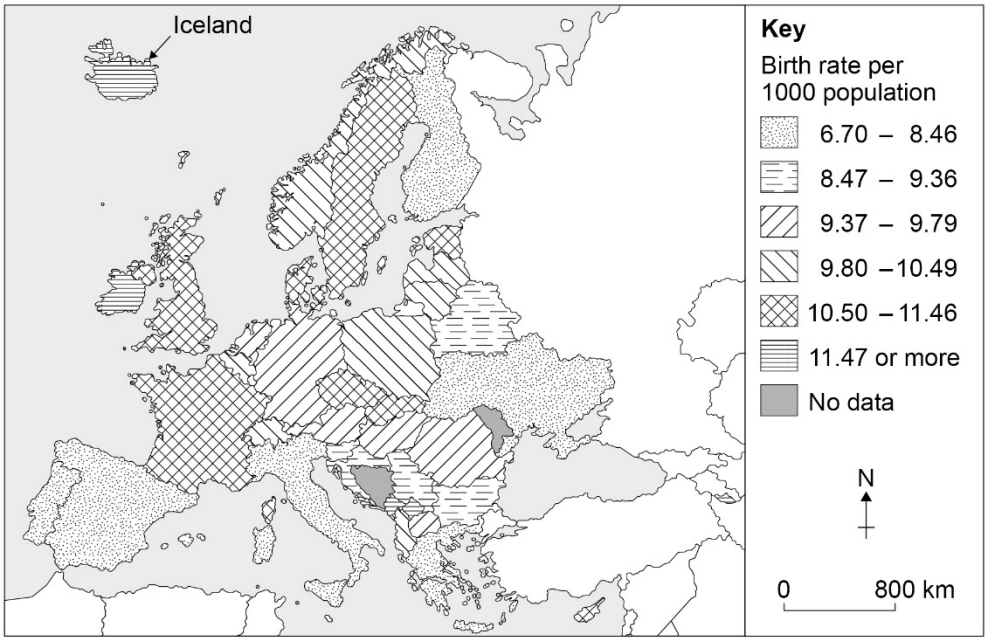
Level	Marks	Description
3 (Detailed)	5–6	AO2 – Shows detailed understanding of the environmental sustainability issues around modern industrial developments. AO3 – Demonstrates thorough application of knowledge and understanding to offer judgement of the example provided and the link to sustainability of modern industrial developments in broader terms.
2 (Clear)	3–4	AO2 – Shows clear understanding of the environmental sustainability issues around modern industrial developments. AO3 – Demonstrates some application of knowledge and understanding to offer some judgment of the example provided and / or the link to sustainability of modern industrial developments in broader terms.
1 (Basic)	1–2	AO2 – Shows limited understanding of the environmental sustainability issues around modern industrial developments. AO3 – Demonstrates limited application of knowledge and understanding to offer basic judgment of the example provided and / or the link to sustainability of modern industrial developments in broader terms.
	0	No relevant content.

- **Level 3 responses** will cover the figure and well-developed geographical understanding and provide a considered judgment of the link to sustainability.
- **Level 2 responses** will show reasonable understanding of the link to sustainability using the figure and clear geographical understanding or more considered judgment for just the figure or own understanding used.
- **Level 1 responses** will show simple understanding of the link to sustainability using the figure and / or simple geographical understanding.
- **Max Level 2 for figure or own understanding only.**

<u>Indicative content</u>

- Students may demonstrate their geographical understanding through use of a named example, although this is not explicitly asked for in the question.
- **Figure 6** shows the Southampton Science Park has an attractive setting with lots of green space and trees. It is well served by public transport and aims to minimise waste and be energy efficient.
- Reference to **Figure 6** may be inferred even if not explicitly stated through comment on the above aspects in relation to environmental sustainability.
- The figure also shows large amounts of cars parked which, along with the buses, may contribute to air pollution and congestion.
- The building of the Science Park required the removal of trees and green space.
- The command 'to what extent' requires a view to be taken on the sustainability credentials of modern industrial developments.

		• Candidates may contrast their understanding of modern industrial developments with industrial developments in the past and decide whether they are now more sustainable or still have sustainability issues. • Specific examples of either modern or past industries / industrial developments may be used to support the points raised. AO2 – 3 marks AO3 – 3 marks	

02	4	**Complete Figure 7 using the following data.** One mark for correct completion of graph. Iceland shaded correctly – 12.3  AO4 = 1 mark	1

02	5	**Outline one disadvantage of using birth rates as a measure of development.** One mark for an initial overall comment or single relevant statement eg • Birth rates may be affected by government policies. (1) • Birth rates may not be accurate. (1) • There may be great variation within a country. (1) Second mark for developing the comment eg • Birth rates may be affected by government policies (1) so more / less babies may be born if incentives / disincentives are offered. (d)(1) • Birth rates may not be accurate (1) because there may not be a reliable system of recording births. (d)(1) • There may be great variation within a country (1) with lower rates in the cities hiding high rates in rural areas / distorting the overall picture. (d)(1) Credit any reasonable statement. No credit for development measures other than birth rates. AO1 – 2 marks	2

02	6	**Which measure of development combines income, life expectancy and education levels?** One mark for the correct answer. **B** – Human Development Index (HDI) No credit if two or more answers are circled. AO1 – 1 mark	1

02	7	**Outline one physical cause of uneven development.** Candidates should clarify the factor and its resultant impact upon development. There is no requirement for an example though it may aid clarity and development. Specification states this in the context of LIC/NEE but question does not, therefore allow valid positive points in HICs. One mark for an initial overall comment or single relevant statement eg • Some countries are landlocked (1). • Natural hazards can cause damage (1). • Hot climates can lead to tropical diseases (1). Second mark for developing the comment eg • Some countries are landlocked (1) which makes it difficult to trade with other countries (d)(1). • Natural hazards can cause damage (1). This makes it hard to develop as money must be spent on rebuilding (d)(1). • Hot climates can lead to tropical diseases (1) and if people are ill they can't work and earn money (d)(1). No credit for factors other than physical ones. AO1 – 2 marks	2

02	8	**Calculate the interquartile range for the data in Figure 8.** IQR = 502 947 Award 2 marks if answer correct even if no working. Allow one mark if evidence of attempting to work out correctly eg accurately calculating both upper and lower quartiles but answer subsequently wrong. UQ = 560 035 LQ = 57 088 AO4 – 2 marks	2

02	9	**Suggest how debt relief can help reduce the development gap. Use Figure 9 and your own understanding.**	4

Level	Marks	Description
2 (Clear)	3–4	AO2 – Shows clear understanding of debt relief and the process of development. AO3 – Uses **Figure 9** effectively and offers development to analyse the link between the debt relief and the development gap.
1 (Basic)	1–2	AO2 – Shows limited understanding of debt relief and the process of development. AO3 – Uses **Figure 9** OR own understanding to begin to analyse the link between debt relief and the development gap
	0	No relevant content.

- **Level 2 responses** will apply geographical knowledge and understanding in combination with the figure to connect debt relief to increased development.
- **Level 1 responses** will show simplistic interpretation or simply assert a basic link between debt relief and development.

Indicative content

- Answers should make use of **Figure 9** which may be clear through reference to specific points shown in the figure or more implicit through reference to healthcare or government spending.
- Development need not be through use of a named place but use of an example may add clarity and should be credited.
- From **Figure 9**: links made to the strain put on public services such as healthcare when the country is having to pay back loans instead and may be forced to increase taxes and reduce spending to make repayments.
- Debt relief will allow countries to spend more on health, education and improving the standard of living for their populations. Therefore, the population will be healthier and better educated and more able to earn money / grow food / contribute to the economy.
- Increased economic improvements can lead to social improvements with rises in HDI / literacy rates / life expectancy.

AO2 – 2 marks
AO3 – 2 marks

02	10	**Suggest how economic development can bring improvements to quality of life but at a cost to the environment. Use a case study of a LIC/NEE in your answer.**	9

Level	Marks	Description
3 (Detailed)	7–9	AO1 – Demonstrates detailed knowledge of environmental impacts and effect on quality of life of economic development in a LIC/NEE. AO2 – Shows a thorough understanding of the impacts of economic development in a LIC/NEE. AO3 – Demonstrates thorough application of knowledge and understanding in analysing how economic development brings both costs and benefits.
2 (Clear)	4–6	AO1 – Demonstrates clear knowledge of environmental impacts and effect on quality of life of economic development in a LIC/NEE. AO2 – Shows a reasonable understanding of the impacts of economic development in a LIC/NEE. AO3 – Demonstrates reasonable application of knowledge and understanding in analysing how economic development brings both costs and benefits.
1 (Basic)	1–3	AO1 – Demonstrates basic knowledge of environmental impacts and effect on quality of life of economic development. AO2 – Shows a limited understanding of the impacts of economic development in a LIC/NEE. AO3 – Demonstrates limited application of knowledge and understanding in analysing how economic development brings costs and / or benefits.
	0	No relevant content.

- **Level 3 responses** will provide specific detail of the impacts of economic development on both quality of life and the environment in a named LIC/NEE and show how the two are linked.
- **Level 2 responses** will either provide specific detail of the impacts of economic development on quality of life and / or the environment in a named LIC/NEE or well-judged connection between generic impact(s).
- **Level 1 responses** will give basic link(s) between impact(s) and economic development or merely assert an opinion.
- **Max L2** if LIC/NEE country not named or cannot be inferred.
- **Max L2** if not LIC/NEE.
- **Max L2** if the link between the costs and benefits is not established.

<u>Indicative content</u>

		• Clearly specific content will vary according to the chosen country and development. Whilst the question does not state the need to answer this via the operation of a TNC, that may well be the approach taken. • Candidates should address the 'but at a cost to' focus of the questions by showing how there may be benefits but these are accompanied by costs and they should therefore be attempting to link them. This may be achieved through locational context or by linking to the operations of one industry or company. • Candidates are not asked to take a view on this statement but to explain the connection. • There is no requirement for balance between the two aspects. ✓ Positive points must relate to quality of life: ✓ Likely case studies are Nigeria and the Oil industry / Shell; Unilever in India; General industrial development in Rio, Brazil. ✓ Unilever employs 16 000 people in India which means people have a greater income to spend on better food, housing and schooling to improve their quality of life. ✓ Unilever has specific programmes targeted at quality of life such as Project Shakti which helps 45 000 poor rural women sell Unilever products and therefore gives an income opportunity they would not have otherwise. If women gain an increased income, research indicates it is has a bigger impact on whole family quality of life than men gaining an income. ✓ Quality of life is directly improved by sanitation being provided to 115 million people in India. ✓ Similar comments could be made for oil / Shell in Nigeria such as 65 000 workers in Nigeria are directly employed by Shell and 250 000 workers are indirectly employed, thus improving incomes and allowing spending on items and activities to improve quality of life. ✓ In common with other large companies which set up charities to improve quality of life in host countries, Shell has the 'Shell Foundation'. This aims to help sustainability & biodiversity in Nigeria and also help local communities. × Negative points should refer to the environment: × Economic development will usually mean increased carbon emissions and therefore lower air quality such as the notorious Delhi smogs (frequently reported as the most polluted city in the world) and with global consequences for climate change. × Lack of attention to safety laws can result in contamination such as the Unilever mercury spill in Kodaikanal in India. × Resource exploitation can result in habitat destruction such as the oil spills affecting the Ogoni fishing grounds in the Niger Delta. × Credit candidates who link economic growth and development to poor quality urban growth and the associated environmental consequences such as large waste dumps and vehicle exhaust pollution. AO1 – 3 marks AO2 – 3 marks AO3 – 3 marks	

Section C

Qu	Pt	Marking Guidance	Total marks
03	1	**What is solar energy?** Credit any reasonable expression of energy that is derived from the sun. AO1 – 1 mark	1
03	2	**Suggest how the energy mix used to generate the UK's electricity has changed in the last 30 years. Use Figure 10 and your own understanding.** Credit any reasonable suggestion of one or more changes. Must make use of **Figure 10** for any marks, this could be through data or inferred through naming energy sources seen on the infographic. Candidates should use some language expressing change for full marks rather than simply describing the data shown, which is one point in time. One mark for a basic statement, which may not explicitly show use of the figure, eg • The UK is using more renewable energy. (1) • Coal is now just a small percentage of the energy mix. (1) • Wind now provides nearly as much electricity as natural gas. (1) Two marks for a development or alternative idea which focusses on the differences, eg • The UK now uses much more renewable energy (1) with renewables at 38% as the largest single source of electricity. (d)(1) • Coal is now just a small percentage of the energy mix (1) whereas in the 1990s it provided the bulk of the UK's electricity supply. (d) (1) • Wind now provides nearly as much electricity as natural gas (1) unlike the 'dash for gas' at the end of the 20th C when gas dominated the supply. (d)(1) No credit for explanation of the changes. AO3 – 2 marks	2

03	3	**Explain why demand for different energy sources has changed in the UK.** Credit any reasonable explanation or development of point eg • There is increasing concern about the environment / worries about climate change (1) which means we have switched to less polluting forms of energy (1) which generate less CO_2 (1). • Nuclear power plants have aged and not been replaced (1) which has led to a decline in demand for uranium (1) as the UK has declined from a 12.7 GW capacity in 1994 (1). • Legislation to meet climate change targets (1) means the UK has to produce less CO_2 (1), the major source of which is fossil fuels such as coal and oil (1). Reserves of coal and oil are declining (1) which has made them more expensive (1) and other sources of energy such as onshore wind are now cheaper (1). 1x3, 3x1, or (1+1)+1 No credit for description of energy supply changes in isolation. Must be reason not description. AO2 – 3 marks	3

03	4	**'Trying to reduce the carbon footprint of food in the UK creates opportunities and challenges.'** **Use Figure 11a and Figure 11b to explain this statement.**	6

Level	Marks	Description
3 (Detailed)	5–6	AO2 – Shows detailed understanding of the opportunities and challenges arising from trying to reduce the carbon footprint of food in the UK. AO4 – Demonstrates high level of skill by investigating the resources provided thoroughly and using them to support understanding.
2 (Clear)	3–4	AO2 – Shows some understanding of the opportunities and / or challenges arising from trying to reduce the carbon footprint of food in the UK. AO4 – Demonstrates moderate level of skill by investigating the resources provided partially and using them to support understanding.
1 (Basic)	1–2	AO2 – Shows limited understanding of the opportunities and / or challenges arising from trying to reduce the carbon footprint of food in the UK. AO4 – Demonstrates limited level of skill by investigating the information provided superficially and using it simplistically.
	0	No relevant content.

- **Level 3 responses** will provide a considered understanding of both opportunities and challenges, supported with thorough use of the information.
- **Level 2 responses** will give a clear understanding of opportunities and / or challenges, supported with either thorough or generically clear use of the information.
- **Level 1 responses** will show basic understanding and use of the information.
- **Max Level 2 without any reference to the figure.**

<u>Indicative content</u>

- **Figure 11a** shows some sources of what might be regarded as 'everyday' foods and the thus the distances they travel.
- **Figure 11b** shows a pie chart breaking down the emissions from different stages of the food production process.
- Candidates should show awareness of how carbon footprints are complicated by distant supply chains but that is complicated by the relatively small percentage of emissions that come from transport.
- Credit any reasonable **challenges**, which could be for the UK elsewhere in the world, these are likely to include:

		• The use of **Figure 11a** to show the large distances travelled by 'typically British' food. • Food miles and the impact of transportation by plane or lorries. • Emissions created by methane from animals or the destruction of forests for grazing land. • The challenge for UK producers to meet demand at low economic cost and low 'carbon cost'. This may also cover seasonality of supply as out of season production may require high energy inputs which may be higher overall than imported food. • They may recognise the challenge for foreign food suppliers if their UK market is lost. • Credit any reasonable **opportunities**, which may include: • The opportunity for UK suppliers to meet the clear demand for everyday produce. • The opportunity for foreign producers to meet demand for produce when not in season in the UK. • **Figure 11b** should be used to suggest that importing food is not necessarily negative for the carbon footprint as transport is a small percentage of the total. • **Figure 11a/b** should be evidenced by reference to figures given or description that is accurate enough to infer use of the resource rather than learned knowledge. AO2 – 3 marks AO4 – 3 marks	

Qu	Pt	Marking Guidance	Total marks
04	1	**How many of the countries shown in Figure 12 had a serious threat level?** One mark for the correct answer. **B** – 4 (1 mark) **What percentage of the 25 countries shown had a serious threat level?** 16% (1 mark) Percentage sign not required. If the candidate has made a mistake in the first part then allow the corresponding answer to the second part of the question: A – 12%, C – 20%, D – 24% AO4 – 2 marks	2
04	2	**Describe the pattern of the threat from locusts shown in Figure 12.** Answers should make use of **Figure 12** through naming countries and locations in order to describe the distribution. One mark for a basic statement, eg • A band of threat across the S of the Sahara. (1) • The worst threat is in east Africa. (1) • The threat level reduces as you move further west. (1) Second mark may be a second separate point or developed point for further clarity eg • A band of threat across the S of the Sahara (1) with the highest threat level in Kenya, Somalia and Ethiopia. (d) (1) • The worst threat is in east Africa (1) with the threat level reducing further west. (d) (1) • The threat level reduces as you move further west (1) with the biggest swarms found in East Africa. (d) (1) Accept 'horn of Africa' in place of east Africa or naming countries with highest threat. Accept description of movement as pattern of threat. No credit for explanation. AO4 – 2 marks	2

04	3	**What is food insecurity?** One mark for a correct answer, eg Lack of food. (1) Not being able to access safe and nutritious food. (1) No credit for definition of food deficit. AO1 – 1 mark	1

04	4	**Explain how pests and diseases can affect food supply.** One mark for a basic statement, eg • Pests eat crops. (1) • Diseases can reduce yields / destroy crops. (1) • Poor storage allows mice and rats to eat crops. (1) Two marks for a developed idea eg • Pests eat crops (1) such as locusts which can devour a whole field in a few hours (d) (1)/ leaving less food for human consumption. (d) (1) • Diseases can reduce yields / destroy crops (1) such as wheat rust which threatens c.1/3 of world crops. (d) (1) • Poor storage allows mice and rats to eat crops (1) so that the supply is reduced even if harvested. (d) (1) Credit human diseases eg malaria affecting ability to work and therefore reduced yields. Credit historical examples eg 1845 Irish potato famine due to blight. Answer does not need to make use of **Figure 12** although it is possible students may use this as a stimulus. Two marks also possible for 2 basic statements. AO2 – 2 marks	2

04	5	**To what extent can appropriate technology and other strategies increase food supply?** **Use Figure 13 and your own knowledge.**	6

Level	Marks	Description
3 (Detailed)	5–6	AO2 – Shows detailed understanding of the relationship between appropriate technology and food supply. AO3 – Demonstrates detailed application of knowledge and understanding by interpreting the resources thoroughly and effectively and linking to food supply.
2 (Clear)	3–4	AO2 – Shows clear understanding of the relationship between appropriate technology and food supply. AO3 – Demonstrates some application of knowledge and understanding by interpreting the resources with some effectiveness and / or linking to food supply.
1 (Basic)	1–2	AO2 – Shows limited understanding of the relationship between appropriate technology and food supply. AO3 – Demonstrates limited application of knowledge and understanding through basic interpretation of the resources provided and / or linking to food supply.
	0	No relevant content.

- **Level 3 responses** will cover the figure and either a named example or well developed geographical understanding and provide a considered interpretation of the link.
- **Level 2 responses** will show reasonable understanding of the link using the figure and an example / clear geographical understanding or more considered interpretation for just the figure or example used.
- **Level 1 responses** will show simple understanding of the link using the figure and / or a named example / simple geographical knowledge. May be limited to generic statements.
- **Max top L2** if **Figure 13** or own knowledge only.
- **Max top L2 if only one strategy addressed.**

- Answers may be entirely positive or negative but should show some awareness of 'to what extent' for full credit.

<u>Indicative content</u>

- Whilst there is a requirement in the specification to study appropriate technology, it is possible that candidates have studied the example given, so that should be credited.
- There is no requirement to use a specific case study example or named place although candidates may well approach the answer via a suitable example to demonstrate their understanding.

		• The specification lists irrigation, aeroponics and hydroponics, the new green revolution and use of biotechnology along with appropriate technology, so any of those should be credited as part of an answer. • Equally, if they make use of a large scale or local scheme, that could be a valid approach. • Answers should make use of **Figure 13** and appropriate geography, balance is not required. • Reference to **Figure 13** may be inferred even if not explicitly stated through such comments as: simple farming techniques can improve yields, techniques are adapted to climate and conditions. • A wide range of responses are possible, credit any reasonable responses: • The Zaï technique clearly shows that yields can be improved and therefore food supply increased. • You can see in the photograph that the crops are growing well despite the dry soil so it suggests they will produce more yield and improve supply. • It is appropriate technology because it is simple, requires no particular equipment, and is suited to the local conditions. • We know that food supply is increased because yields have increased by up to 500%. • Positive comments may be qualified by realisation that this is inevitably small scale so may not improve supply for all. • Also that issues of climate change such as a less reliable rainy season may mean that such ideas cannot solve all issues. AO2 – 3 marks AO3 – 3 marks	

Qu	Pt	Marking Guidance	Total marks
05	1	**How many of the African countries shown in Figure 14 had a high risk of water insecurity in 2019?** B: 9 (1 mark) **What percentage of the 48 countries in Africa shown had a high risk of water insecurity in 2019?** 18.8% (1 mark) Percentage sign not required. Answer must be to one decimal place. If the candidate has made a mistake in the first part then allow the corresponding answer to the second part of the question: A – 16.7%, C – 20.1%, D – 22.9% AO4 – 2 marks	2
05	2	**Describe the distribution of countries which had a very low risk of water insecurity shown in Figure 14.** Answers should make use of **Figure 14** through naming countries and locations in order to describe the distribution. One mark for a basic statement, eg • Western central and central Africa. (1) • The largest single area is central Africa stretching towards the south. (1) • Madagascar is the only country that doesn't connect with others in this category. (1) • Most are on the coast (1) Second mark may be a second separate point or developed point for further clarity eg • Western central and central Africa (1) with the western African section surrounding Ivory Coast. (d) (1) • The largest single area is central Africa stretching towards the south (1) in a belt stretching west – east from Gabon – Kenya. (d) (1) • Madagascar is the only country that doesn't connect with others in this category (1) although it is on the same latitude as the SE of the central African. (d) (1) No credit for explanation. AO4 – 2 marks	2

05	3	**What is water insecurity?** One mark for a correct answer, eg Lack of water. (1) No reliable clean / accessible / affordable water supply. (1) No credit for definition of water deficit. AO1 – 1 mark	1

05	4	**Explain how limited infrastructure can affect water supply.** One mark for a basic statement, eg • Lack of pipes means water doesn't reach people. (1) • Poor standard of infrastructure means water can be contaminated. (1) • Cities urbanise too rapidly for the supply / sewerage network to keep up. (1) Two marks for a developed idea eg • Lack of pipes means water doesn't reach people (1) so many rely on water deliveries which can be unreliable / expensive. (d) (1) • Poor standard of infrastructure means water can be contaminated (1) which means the supply carries diseases. (d) (1) • Cities urbanise too rapidly for the supply / sewerage network to keep up (1) so there is insufficient / unclean water provided. (d) (1) Two marks also possible for 2 basic statements. AO2 – 2 marks	2

05	5	**To what extent can desalination and other strategies increase water supply?** **Use Figure 15a and Figure 15b and your own knowledge.**	6

Level	Marks	Description
3 (Detailed)	5–6	AO2 – Shows detailed understanding of the relationship between desalination and / or other strategies to ensure supply. AO3 – Demonstrates detailed application of knowledge and understanding by interpreting the resources thoroughly and effectively and linking to water supply.
2 (Clear)	3–4	AO2 – Shows clear understanding of the relationship between desalination and / or other strategies to ensure supply. AO3 – Demonstrates some application of knowledge and understanding by interpreting the resources with some effectiveness and / or linking to water supply.
1 (Basic)	1–2	AO2 – Shows limited understanding of the relationship between desalination and / or other strategies to ensure supply. AO3 – Demonstrates limited application of knowledge and understanding through basic interpretation of the resources provided and / or linking to water supply.
	0	No relevant content.

- **Level 3 responses** will cover the figure(s) and either a named example or well developed geographical understanding and provide a considered interpretation of the link.
- **Level 2 responses** will show reasonable understanding of the link using the figure(s) and an example / clear geographical understanding or more considered interpretation for just the figure or example used.
- **Level 1 responses** will show simple understanding of the link using the figure(s) and / or a named example / simple geographical knowledge. May be limited to generic statements.
- **Max top L2** if **Fig 15** or own understanding only.
- **Max top L2 if only one strategy addressed.**
- Answers may be entirely positive or negative but should show some awareness of 'to what extent' for full credit.

<u>Indicative content</u>

- Whilst there is a requirement in the specification to study desalination, it is possible that candidates have studied the example given, so that should be credited.

		• There is no requirement to use a specific case study example or named place although candidates may well approach the answer via (a) suitable example (s) to demonstrate their understanding. • The specification lists diverting supplies and increasing storage, dams and reservoirs, water transfers and desalination, so any of those should be credited as part of an answer. • Equally, if they make use of a large scale water transfer or local scheme, that could be a valid approach. • Answers should make use of **Figure 15** and appropriate geography, balance is not required. • Reference to **Figure 15** may be inferred even if not explicitly stated through such comments as: desalination allows locations next to the sea to create clean water, rich Gulf states produce much of their water from desalination. A wide range of responses are possible, credit any reasonable responses: • Desalination does work and can provide a regular supply of water. • Countries that rely on desalination have developed more efficient plants which improves reliability and reduces cost. • We know it can guarantee supply because Dubai gains 99% of its water from desalination. • Desalination can work on a large scale to guarantee supply such as Ras Al Khair, Saudi Arabia which produces > 1 million m3/day • Positive comments may be qualified by realisation that this is a very expensive process (see data in table in **Figure 15**) so is really restricted to wealthy nations. • Also that issues of sustainability are important as this is a very energy intensive technique, usually reliant on fossil fuels. AO2 – 3 marks AO3 – 3 marks	

Qu	Pt	Marking Guidance	Total marks
06	1	**How many of the countries shown in Figure 16 produced 41–60% of their electricity from renewable sources in 2019?** B: 7 (1 mark) **What percentage of the 41 countries in Europe for which data is shown produced 41–60% of their electricity from renewable sources in 2019?** 17.1% (1 mark) Percentage sign not required. Answer must be to one decimal place. If the candidate has made a mistake in the first part then allow the corresponding answer to the second part of the question: A – 14.6%, C – 19.5%, D – 22.0% AO4 – 2 marks	2
06	2	**Describe the distribution of countries which produced 0–20% of their electricity from renewable sources in 2019.** Answers should make use of **Figure 16** through naming countries and locations in order to describe the distribution. One mark for a basic statement, eg • Almost all / the majority are in eastern Europe (1) • Only one north-western European country, the Netherlands (1) • Most are in a continuous area with two separate isolated countries(1) Second mark may be a second separate point or developed point for further clarity eg • Almost all / the majority are in eastern Europe (1) moving east from Czech Republic and Hungary. (d) (1) • Only one north-western European country, the Netherlands (1) with all the others bar one in eastern Europe. (d) (1) • Most are in a continuous area with two separate isolated countries (1) the Netherlands in the north and Cyprus in the south. (d) (1) No credit for explanation. AO4 – 2 marks	2

06	3	**What is energy insecurity?** One mark for a correct answer, eg Lack of energy (1) No reliable energy supply (1) No credit for definition of energy deficit. AO1 – 1 mark	1

06	4	**Explain how political factors can affect energy supply.** One mark for a basic statement, eg • War prevents exports of oil. (1) • Political uncertainty may mean countries seek alternative supplies. (1) • Local politics can prevent new energy supply schemes being built. (1) Two marks for a developed idea eg • War prevents exports of oil (1) such as the Gulf War which limited oil supply / pushed prices up so it was harder to afford. (d) (1) • Political uncertainty may mean countries seek alternative supplies (1) such as concern over Russia 'turning the gas off' so some European countries prefer nuclear power. (d) (1) • Local politics can prevent new energy supply schemes being built (1) such as objections to wind turbines so the supply has to come from other sources. (d) (1) Two marks also possible for 2 basic statements. AO2 – 2 marks	2

06	5	**To what extent can wind and tidal power and other strategies increase energy supply?** **Use Figure 17 and your own knowledge.**	6

Level	Marks	Description
3 (Detailed)	5–6	AO2 – Shows detailed understanding of the relationship between wind and tidal power and / or other strategies to ensure supply. AO3 – Demonstrates detailed application of knowledge and understanding by interpreting the resource thoroughly and effectively and linking to energy supply.
2 (Clear)	3–4	AO2 – Shows clear understanding of the relationship between wind and tidal power and / or other strategies to ensure supply. AO3 – Demonstrates some application of knowledge and understanding by interpreting the resource with some effectiveness and / or linking to energy supply.
1 (Basic)	1–2	AO2 – Shows limited understanding of the relationship between wind and tidal power and / or other strategies to ensure supply. AO3 – Demonstrates limited application of knowledge and understanding through basic interpretation of the resource provided and / or linking to energy supply.
	0	No relevant content.

- **Level 3 responses** will cover the figure and either other strategies or well developed geographical understanding and provide a considered interpretation of the link.
- **Level 2 responses** will show reasonable understanding of the link using the figure and other strategies / clear geographical understanding or more considered interpretation for just the figure or example used.
- **Level 1 responses** will show simple understanding of the link using the figure and / or other strategies / simple geographical knowledge. May be limited to generic statements.
- **Max top L2** if **Figure 17** or own knowledge only.
- **Max top L2 if only one strategy addressed.**

- Answers may be entirely positive or negative but should show some awareness of 'to what extent' for full credit.

<u>Indicative content</u>

- There is no requirement to use a specific case study example or named place although candidates may well approach the answer via (a) suitable example (s) to demonstrate their understanding.

		• The specification lists renewable (biomass, wind, hydro, tidal, geothermal, wave and solar) and non-renewable (fossil fuels and nuclear power), so any of those should be credited as part of an answer. • Equally, if they make use of extraction of a fossil fuel or a local renewable energy scheme, that could be a valid approach. • Answers should make use of the figure and appropriate geography, balance is not required. • Reference to the figure may be inferred even if not explicitly stated through such comments as: The UK has expanded wind power in recent years, The large tidal range of the UK, makes this a very suitable power source. A wide range of responses are possible, credit any reasonable responses: • Wind and tidal power do work and can provide a significant supply of energy. • Renewables now account for more of the UK's energy supply than fossil fuels and since we do not have power cuts this shows they work. • Renewable energy is much more sustainable so therefore is more likely to provide energy security in the long term. • Positive comments may be qualified by realisation that renewable energy can be less reliable such as if there is too little / too much wind and that tidal energy is produced twice each day. • Therefore there are constancy and flexibility of supply issues and also problems with storage eg battery technology needs more development to ensure supply. AO2 – 3 marks AO3 – 3 marks	