Mark Scheme (Results)

Summer 2023

Pearson Edexcel GCE
In Geography (9GE0)
Paper 3

Summer 2023
Question Paper Log Number P72621A
Publications Code 9GE0_03_2306_MS

General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Question number	**Explain one reason why global demand for energy is likely to rise.** **Indicative content**	**Mark** **4**
1	**AO1 (4 marks)** Award **1** mark for identifying a key reason why global energy demand is likely to rise and up to a further **3** marks for expansion up to a maximum of **4** marks. The main reasons offered are likely to be economic growth, a growing middle class or population increase or versions of same. For example: The continued economic growth inevitably leads to increased energy demand/and or a rising middle-class (1) especially in large emerging economies such as India and China) (1) with increases in domestic and industrial consumption of energy (1) reflecting rising incomes and an expanding industrial infrastructure (1) Global population continues to rise so energy demand will also rise (1) currently 7.8bn and expected to peak at about 10.9 bn in 2100 (1) more consumption is inevitable if more food required, more goods required etc. (1) growth most likely in much of Africa and south Asia where fertility rates remain >2 (1) Allow a mix of these as in: Global population continues to rise so energy demand will also rise (1) including a growing middle-class of consumers (1) especially in large emerging economies such as India and China) (1) with increases in domestic and industrial consumption of energy (1) **Accept any other appropriate response.**	**(4)** **(1)+(1+1+1)**

Question number	Calculate the mean % of people who agreed that climate change is a major threat to their country. Indicative content	Mark 2
2 (a) (i)	**Method (1)** Sum the 11 countries % = 59+67+ etc. = 778 – Divide by 11 **Result (1)** 70.7% (1)	**1+1**

Question number	Calculate the interquartile range of the % of people who agreed that climate change is a major threat. Indicative content	Mark 2
2 (a) (ii)	**Method (1)** Find middle value (median) Q2 = 69 So Q1 = 62 Q3 = 81 *81-62 Or formula Q1 = (n+1/4) (1) **Result (1)** Accept either *81-62 (1) or 62-81 (1) or 19 (1) *Please note that 81-62 is sufficient for the method mark but also the answer so 81-62 = 2 marks	**1+1**

Question number	**Explain why the data on Table 1 may not be a reliable guide to global opinions about the threat of climate change.** **Indicative content**	**Mark** **4**
2(b)	**AO3 (4 marks)** Expect more than one point to be developed. The focus of this question is on reliability and accuracy. The best answers will address both of these ideas but not necessarily explicitly so. Only 11 countries (1) out of 180+ possible 'countries' (1) and not a representative sample either (1) no emerging or low income countries (1) many of the latter group more impacted by climate change (1) and (much) less likely to have high carbon footprints (1) There is no information as to how representative the sample within these countries might be (1) how many respondents? (1). The data is from 2019 (1) which is 4 years ago and 'things' will have changed (1) Subjective nature of question 'major' threat – what does that mean (1) 'lost in translation' perhaps (1) no information about what those who did not support the statement might think – a threat but not major? Or No threat at all (1) **Accept any other appropriate response.**	**(4)** **(1+1 + 1+1) or (1+1+ 1) +1**

Question number	Study Figure 1 and Figure 2 in Section A of the Resource Booklet. Analyse the relationship between global population growth and land-use changes. Indicative content
3	**AO1 (4 marks)/AO3 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive, and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: **AO1** • 1700 might be an appropriate starting date for the Anthropocene • Diets have changed especially in recent times – since 1900 – with meat eating becoming much more common so requiring much more grazing land • Agriculture has also changed with industrial farming commonplace – growth of feedlots for example • Significant growth in cropland to grow crops for animal feed – soya (tofu) the most interesting example • Loss of forest likely to impact on indigenous peoples in the short term.. • ..but significant impacts on global climate too • Some forest loss also attributed to biofuels • Oil is at the heart of the global economy and a frequent cause of conflict • This ancient store of organic carbon has allowed huge increases in living standards in many, but not all, global regions • The relationship between human population growth and land-use in not direct but mediated through uneven economic growth **AO3** • Figure 1 (graphic) Human population has grown very rapidly requiring more farmland for food • Figure 1 (graphic) Population growth rate slowing down – it peaked in 1968 • Figure 1 (graphic) global population should peak in next 50 years at around 10.5 billion but still significant pressure of farmland as a resource • Figure 1 (text) population growth has been outstripped by economic growth many times over fuelled by fossil fuel • Figure 2 (graphic) shows a significant decline in forests since 10,000 years ago – data to support e.g. 57% to 38%

	• Figure 2 (graphic) shows that the rate of decrease has accelerated rapidly from 1900 to 2018 – data to support 48% to 38% • Figure 2 (graphic) shows a significant decline in wild grassland and shrubs since 10,000 years ago – data to support 42% to 14% • Figure 2 (graphic) shows that the rate of decrease has accelerated rapidly from 1900 to 2018 – data to support 27% to 14% • Figure 2 (graphic) shows that cropland was negligible until 1900 and very rapid increase since – doubling from 8% to 15% • Figure 2 (graphic) shows that grazing was negligible until 1700 and very rapid increase since – again nearly doubling in past 120 years from 16% to 31% • Figure 2 (graphic) shows that 46% of land once occupied by forests and wild grassland/shrub is now farmed. • Figure 2 (text) states that by 1000AD 4million km^2 was farmed – now increased to 46% of total useable land. **Accept any other appropriate responses.**

Level	**Mark**	**Descriptor**
	0	No rewardable material.
Level 1	1–3	• Demonstrates isolated elements of geographical knowledge and understanding, some of which may be inaccurate or irrelevant. (AO1) • Investigates the question/issue to produce a limited analysis of data/evidence, making few connections to geographical ideas. (AO3)
Level 2	4–6	• Demonstrates geographical knowledge and understanding, which is mostly relevant but may include some inaccuracies. (AO1) • Critically investigates the question/issue to produce an analysis of data/evidence, making some logical connections to geographical ideas, which are mostly relevant. (AO3)
Level 3	7–8	• Demonstrates accurate and relevant geographical knowledge and understanding throughout. (AO1) • Critically investigates the question/issue to produce a coherent analysis of data/evidence, making logical connections to relevant geographical ideas. (AO3)

Question number	**Study Figure 3, Figure 4a and Figure 4b in Section A of the Resource Booklet.** **Analyse the variations in European forest coverage.** **Indicative content**
4	**AO1 (4 marks) AO3 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: **AO1** • Maybe a classification issue – what constitutes forest coverage – varied densities? Green urban land use for example • Choropleth probably exaggerates differences at a national level at doesn't allow for internal variation within countries -e.g. the UK • No obvious relationship with climate – Finland/Iceland? However 'Little Ice Age' had impact on Iceland. • No obvious relationship to level of development – UK/France similar GDP per capita. • Maybe a relationship with population density – high in UK and Netherlands for example with high densities • But clearly doesn't explain Iceland with its very low densities but also very low forest cover • Norway/ Scotland example strongly suggests a land management explanation for forestry differences challenging idea of 'natural' landscape. **AO3** • Figure 3 (graphic) shows a wide range of forest area % cover with no clear pattern • Figure 3 (graphic) - significant number of European countries in high 20's to low 40's – median probably in the 30's • Figure 3 (text) – more than half have disappeared in past 10,000 years • Figure 3 (text) -mostly because of clearance for agriculture and wood fuel • Figure 3 (text)- idea of forest transition – UK has seen slow afforestation in past 50 years • Figure 3 (text) – land management an obvious cause – Iceland example . • Figure 4 (photos and text) shows contrasting land use in south-west Norway and the north-west of Scotland

	• Figure 4 (photos and text) explains contrasting land use in south-wets Norway and the north-west of Scotland in terms of their social histories • Figure 4 (photos and text) introduces idea of rewilding **Accept any other appropriate response.**

Level	**Mark**	**Descriptor**
	0	No rewardable material.
Level 1	1–3	• Demonstrates isolated elements of geographical knowledge and understanding, some of which may be inaccurate or irrelevant. (AO1) • Investigates the question/issue to produce a limited analysis of data/evidence, making few connections to geographical ideas. (AO3)
Level 2	4–6	• Demonstrates geographical knowledge and understanding, which is mostly relevant but may include some inaccuracies. (AO1) • Critically investigates the question/issue to produce an analysis of data/evidence, making some logical connections to geographical ideas, which are mostly relevant. (AO3)
Level 3	7–8	• Demonstrates accurate and relevant geographical knowledge and understanding throughout. (AO1) • Critically investigates the question/issue to produce a coherent analysis of data/evidence, making logical connections to relevant geographical ideas. (AO3)

Question number	**Evaluate the view that to be effective the mitigation of climate change requires many contrasting strategies.**
5	**AO1 (3 marks)/AO2 (9 marks)/AO3 (6 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: **AO1** • Reliance on fossil fuels remains the global norm – despite the growth of renewables fossil fuel consumption is rising, not falling • Unconventional sources of oil have been widely exploited especially in the US which has had significant environmental impacts; largely negative • All renewable and recyclable energy sources have potential to decouple fossil fuel usage from economic growth • The use of biofuels has potential but is competing for the same land as food production. • Radical technologies have some potential but uncertainty over their practicality or sustainability exist • Mitigation might also be achieved through carbon taxation, carbon capture and reforestation but global agreement is vital if these are to work • Economic growth inevitably leads to higher consumption – that will usually lead to greater resource usage • Global corporations (TNC’s) are obliged to operate in the best interests of their shareholders so short-term growth is important • Global corporations are at the centre of the global economy **AO2** • Question deconstruction needs to include a comment about how effectiveness is to be measured • Some will argue that it is already too late with the 1.5° C target unlikely to be met and significant feedback loops in the system • Switching to renewables is a slow process and we may not have the time – a sudden switch can not be achieved without an enormous blow to the global economy – almost all international trade is driven by fossil fuels and the technology to fly aircraft or power shipping with non-fossil fuel alternatives is not developed • The issues surrounding mitigation are many and complex – above all the need for international cooperation which seems to be a vain

Question number	**Evaluate the view that to be effective the mitigation of climate change requires many contrasting strategies.**
	hope given the political nature of the debate and its polarising impact • The developed western world is in no position to lecture – candidates may cross reference to the deforestation of Europe • hope • Some may point out that it is not a coincidence that Australia and the US have conflicted populations given Australia's reliance on fossil fuel exports and the US's search for energy security. • There is no significant political figure who argues for a slowdown in global growth – that remains on the margins politically although it is a central part of the debate in academia. • There is money to be made in the development of some renewables and, above all in in some artificial engineering schemes • These schemes, if they worked, would allow business as usual for the extraction of fossil fuels • Mitigation through techno-fix innovation may buy some time to allow a global retreat from fossil fuel consumption • There are significant political tensions revealed at COP 16 and at Paris – India and China have significant economic targets and those are largely built around fossil fuels **AO3** Much of **Section A** shows changes in land use that have had and will continue to have a significant impact on both the carbon and water cycles which in turn will impact on lobal climate. • **Figure 5 (graphic)** shows the importance of four key sectors in the use of fossil fuels – power (generating electricity) transport, above all cars, industry (note cement and iron and steel) and agriculture • **Figure 5 (text) shows that CO_2** emissions have been rising sharply since the pre-industrial era and that this rise correlates well with the recorded rises in global temperatures . • **Figure 6 (table)** shows the very low power densities of renewable energy alternatives when compared to fossil fuels • **Figure 6 (table)** shows that nuclear power might come with a cost given fears about safety and the long-term costs of storing waste • **Figure 6 (text)** suggests that power density and power ratios are significant problems to overcome in the development of renewables • **Figure 6 (text)** suggests that intermittency makes many renewable sources impractical as alternatives • **Figure 6 (text)** states that currently the US meets its energy demand using just 0.5% of its territory • **Figure 7 (graphic)** shows a range of geo-engineering techniques both natural (afforestation) and artificial; carbon capture and SRM

Question number	Evaluate the view that to be effective the mitigation of climate change requires many contrasting strategies.
	- **Figure 7 (text)** explains the differences between natural and artificial geoengineering - **Figure 7 (text)** casts some doubt over both costs and the effectiveness of some of these technologies - **Figure 7 (text)** the involvement of the fossil fuel companies may tell a significant story **Accept any other appropriate response.**

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–6	- Demonstrates isolated elements of geographical knowledge and understanding, some of which may be inaccurate or irrelevant. (AO1) - Applies knowledge and understanding of geographical information/ideas, making limited and rarely logical connections/relationships. (AO2) - Applies knowledge and understanding of geographical information/ideas to produce an interpretation with limited relevance and/or support. (AO2) - Applies knowledge and understanding of geographical information/ideas to produce an unsupported or generic conclusion, drawn from an argument that is unbalanced or lacks coherence. (AO2) - Makes superficial judgements about the value and reliability of quantitative and qualitative data/evidence. (AO3) - Investigates the question/issue to produce a limited interpretation of quantitative and qualitative data/evidence, but lacks meaningful connections to geographical ideas from across the course of study. (AO3)

Level	**Mark**	**Descriptor**
Level 2	7–12	• Demonstrates geographical knowledge and understanding, which is mostly relevant but may include some inaccuracies. (AO1) • Applies knowledge and understanding of geographical information/ideas to find some logical connections/relationships. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce a partial but coherent interpretation that is supported by some evidence. (AO2) • Applies knowledge and understanding of geographical information/ideas to come to a conclusion, partially supported by an argument that may be unbalanced or partially coherent. (AO2) • Makes some valid judgements about the value and reliability of quantitative and qualitative data/evidence. (AO3) • Investigates the question/issue to produce an interpretation of quantitative and qualitative data/evidence, making some meaningful connections to geographical ideas from across the course of study. (AO3)
Level 3	13–18	• Demonstrates accurate and relevant geographical knowledge and understanding throughout. (AO1) • Applies knowledge and understanding of geographical information/ideas to find fully logical and relevant connections/relationships. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce a full and coherent interpretation that is supported by evidence. (AO2) • Applies knowledge and understanding of geographical information/ideas to come to a rational, substantiated conclusion, fully supported by a balanced argument that is drawn together coherently. (AO2) • Makes valid judgements about the value and reliability of quantitative and qualitative data/evidence throughout. (AO3) • Critically investigates the question/issue to produce a coherent interpretation of quantitative and qualitative data/evidence, making meaningful connections to relevant geographical ideas from across the course of study throughout the response. (AO3)

Question number	**Evaluate the view that the crisis of biodiversity loss is both more serious and more challenging to solve than climate change.** **(24)** **Indicative content**
6	**Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. There are several key terms to deconstruct. Firstly the issues of how one measures the seriousness of a threat – serious in what way and for who? The second is 'challenging' – again for who and how do these challenges manifest themselves. **AO1** • There are implications for human well-being posed by climate change • Some evidence of afforestation growth in developed countries • Clear impacts on biological carbon cycle from growing demand for fuel and food • Wider implications for water cycle as a consequence • Future emissions are uncertain because of natural factors and inherent problems of prediction • Attitudes of different countries poses challenges for any mitigation policies • Indigenous people likely to bear the brunt of climate change impacts **AO2** • Climate change is part of a much larger issue of biosphere destruction that will certainly need global action to mitigate which will have huge costs as will adaptation. • The short-term consequences of both are significant but the long-term issues are more challenging – the interrelated nature of food webs is significant here. • There is plenty of evidence that global action to deal with climate change is as ineffective as that to address global inequalities– the prognosis since Paris has not been good and there are very few examples of global action being taken – the banning of chlorofluorocarbons might be quoted as an exception. • There are very powerful vested interests in the dominant model of pursuing economic growth at, more or less, any cost. • The model of globalisation has been built around free-trade, deregulation, privatisation and low tax regimes. It is not clear how these policies sit easily with protection of the biosphere .

Question number	**Evaluate the view that the crisis of biodiversity loss is both more serious and more challenging to solve than climate change.** **(24)** **Indicative content**
	• The United Nations has a patchy track record in engineering global action and there has been a lack of will in addressing climate change and it has no power at all to influence economic and social. development other than through its agencies – • The gap between rich and poor has increased partly because of the distribution of power in the global economy. • The countries in the developing world are not politically powerful and their 'voice' is seldom heard on the international diplomatic stage – thus they are unable to engineer change on their own. Nonetheless they are critically impacted by biosphere destruction whilst the populations who are causing the problem are much more insulated from its impacts • Rewilding implies a significant change of focus for capitalist economies and there is little evidence to support the view that governments are likely to embrace this or the majority of their populations. • For some critics, climate change is significant but sone of the proposed solutions e.g. SRM or DAC or simply ways of carrying in as before – emit more carbon so pump more aerosols which allows economic growth to continue and therefore biosphere destruction. • There are short-term/long-term issues here – the global system is set up on short-termism both politically and economically but biosphere destruction is a long-term issue. • It is also arguable that environmental destruction is not costed so the loss of rainforest species is not accounted. **AO3** The booklet contains resources in Section A and Section B that would be used here as evidence both for and against the contentions in the title. Only the Section C material is covered here. • **Figure 8 (graphic)** the overarching message of the graphic is that significant changes to species extinction began in the 18th century. • **Figure 8 (graphic)** shows that current rates of species extinction are unparalleled when compared to earlier times. • **Figure 8 (graphic)** all vertebrate groups have experienced a very rapid decline • **Figure 8 (text)** difficulty of calculating total species numbers but significance of forests • **Figure 8 (text)** particular importance of tropical rainforests in the global biodiversity • **Figure 8 (text)** stresses the concentration of biodiversity in a limited area • **Figure 8 (text)** sixth extinction idea – faster rate than in any previous period of earth history

Question number	**Evaluate the view that the crisis of biodiversity loss is both more serious and more challenging to solve than climate change.** **(24)** **Indicative content**
	• **Figure 8 (text)** clear acceleration of extinction in the last 100 years with rates 100 to 100 times higher than in previous periods • earthquake has been a depressing example of ‘disaster capitalism’ • **Figure 9 (text)** shows that there are a significant range of threats to biodiversity of which climate change is just one • **Figure 9(text)** shows that there are many causes for species loss • **Figure 9 (text)** shows that pollution and land use changes ae significant • **Figure 9 (graphic)** Top seven are all meat/dairy based • **Figure 9 (graphic)** Bottom seven are all vegetable/fruit based • **Figure 9 (graphic)** Differences are very large so meat x100 land usage when compared with tofu etc. • **Figure 9 (text)** reminder about rewilding and land shortages • **Figure 9 (text)** reminder about the land gained form vegetarianism and veganism. • **Figure 10 (graphic)** shows that debate is highly political • **Figure 10 (graphic)** shows that it is especially polarised in the USA 89/40 • **Figure 10 (graphic)** more consistency of opinion in South Korea, Japan and France

Level	**Mark**	**Descriptor**
	0	No rewardable material.
Level 1	1–6	• Demonstrates isolated elements of geographical knowledge and understanding, some of which may be inaccurate or irrelevant. (AO1) • Applies knowledge and understanding of geographical information/ideas, making limited and rarely logical connections/relationships. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce an interpretation with limited relevance and/or support. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce an unsupported or generic conclusion, drawn from an argument that is unbalanced or lacks coherence. (AO2) • Makes superficial judgements about the value and reliability of quantitative and qualitative data/evidence. (AO3) • Investigates the question/issue to produce a limited interpretation of quantitative and qualitative data/evidence, but lacks meaningful connections to geographical ideas from across the course of study. (AO3)
Level 2	7-12	• Demonstrates geographical knowledge and understanding, which is occasionally relevant and may include some inaccuracies. (AO1) • Applies knowledge and understanding of geographical information/ideas with limited but logical connections/relationships. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce a partial interpretation that is supported by some evidence but has limited coherence. (AO2) • Applies knowledge and understanding of geographical information/ideas to come to a conclusion, partially supported by an unbalanced argument with limited coherence. (AO2) • Makes some valid judgements about the value and reliability of quantitative and qualitative data/evidence. (AO3) • Investigates the question/issue to produce an interpretation of quantitative and qualitative data/evidence, making few connections to geographical ideas from across the course of study, which may not be meaningful. (AO3)

Level	**Mark**	**Descriptor**
Level 3	13-18	• Demonstrates geographical knowledge and understanding, which is mostly relevant and accurate. (AO1) • Applies knowledge and understanding of geographical information/ideas to find some logical and relevant connections/relationships. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce a partial but coherent interpretation that is supported by some evidence. (AO2) • Applies knowledge and understanding of geographical information/ideas to come to a conclusion, largely supported by an argument that may be unbalanced or partially coherent. (AO2) • Makes mostly valid judgements about the value and reliability of quantitative and qualitative data/evidence. (AO3) • Critically investigates the question/issue to produce a coherent interpretation of quantitative and qualitative data/evidence, making connections to relevant geographical ideas from across the course of study, some of which are meaningful. (AO3)
Level 4	19-24	• Demonstrates accurate and relevant geographical knowledge and understanding throughout. (AO1) • Applies knowledge and understanding of geographical information/ideas to find fully logical and relevant connections/relationships. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce a full and coherent interpretation that is supported by evidence. (AO2) • Applies knowledge and understanding of geographical information/ideas to come to a rational, substantiated conclusion, fully supported by a balanced argument that is drawn together coherently. (AO2) • Makes valid judgements about the value and reliability of quantitative and qualitative data/evidence throughout. (AO3) • Critically investigates the question/issue to produce a coherent interpretation of quantitative and qualitative data/evidence, comprehensively making meaningful connections to relevant geographical ideas from across the course of study throughout the response. (AO3)

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