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Mark Scheme (Results)

Summer 2014

Pearson Edexcel GCE in Geography (6GE04)
Unit 4: Geographical Research

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General Marking Guidance

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

QUESTION 1 Assess the reasons why the management of some tectonic hazards is more successful than others.

- Explore the range of strategies used to manage tectonic hazards before, during and after their occurrence.
- Research contrasting examples of managing a range of primary and secondary tectonic hazards.

INDICATIVE CONTENT

The focus of this title is the management of hazardous events in order to prevent loss of life and damage to property – their 'impact'.

The framework chosen may be by:

1. Types of management – 'do nothing', 'adjust' etc…. (can be successful, but may lead to a 'it is more successful if you manage than if you don't manage')
2. Type of tectonic hazard – there are three main types – earthquakes, volcanoes and (secondary) tsunami – best approach would probably be case-study led.
3. Extent of disaster – the size of the event from overwhelming events that challenge any management system to mid-scale and minor events that pose fewer challenges to management systems.

Restrictions – "some" is the most obvious one –some may be, some may not be.

Key analytical points:

- The varied nature of hazardous events needs covering with case studies to show both the extent of the threat and how it is dealt with.
- The success of management needs to be addressed – how does one measure success? Should this be in terms of property/personal injury and death or both?
- Most thoughtful appraisal would be comparison of what would have happened if no management had been in place.
- This might be in terms of loss of life or damage to property.
- Success/failure is likely to be based on:
    1. Size of event – management may be ineffective if event is very large – Japanese tsunami.
    2. Location of event – remoteness, difficulty of access.
    3. Timing of event – time of day/year.
    4. Development/wealth issues that include:
        - Quality of warning/prediction techniques
        - Quality of prior planning e.g. building design
        - Quality of rescue services

So in summary – Some hazardous events are easier to manage than others because of their scale, the nature of the event (i.e. the threat posed) and location/timing of the event but their impact will also be affected by the levels of preparedness which is a function of levels of development and available resources**.** The best answers will address this through **a** strong conceptual understanding and cogent argument and counter argument with a range of reason offered for 'success' or otherwise. They will also show an appreciation of different and clearly identified values/perspectives on what constitutes success that are supported by evidence/example.

Conclusions will be clearly stated with explicit references to title and obvious view taken about success with some valuation of problems of definition

Case studies used are likely to include:

1. California – Loma Prieta
2. Montserrat eruption sequence
3. Iceland - Eyjafjallajökull and others
4. Hawaii
5. Asian tsunami 2004
6. Japanese tsunami 2011
7. Kobe earthquake in 1995

QUESTION 2 'The differences between glacial landscapes are best explained by variations in the physical processes that formed them'. Discuss.

- Explore the role of geomorphological and climatic processes in the formation of glacial and periglacial landscapes.
- Research examples of relict and active glacial landscapes in different locations

INDICATIVE CONTENT

The focus of this title is the **differences** between glacial landscapes, which may or may not include periglacial landscapes

The framework chosen may be by:

1. Type of landform covering a range from both types of environment with a further sub-division between upland and lowland glacial landscapes.
2. Type of landscape – different assemblages of landforms.
3. Nature of physical processes in the different environments.

Restrictions – none although the focus is on landscapes rather than landforms as flagged up in the pre-release. Students should also recognise the significance of 'best'.

Key analytical points:

- Differences is the focus which might stimulate contrast between alpine and ice-sheet glaciation – allow periglacial landscapes
- The contrasts are largely in terms of the scale of their impact on the landscape and particular landforms, especially contrasts between alpine and ice-sheet continental landscapes
- Glacial landscapes in upland areas are very 'positive' with dramatic accentuation of pre-existing landscapes – some of this takes place on a very large scale.
- Glacial landscapes in lowland areas affected by ice-sheets are often 'negative' in that they mask pre-existing landscapes through widespread deposition.
- Most thoughtful appraisal would be assessment of relative role of physical processes alongside rock type, tectonics and post glacial processes in the development of landforms and landscapes
- A process driven approach might address differences in rate/intensity of processes or duration of glacial episodes
- Some will also argue that there is much overlap between different landscapes in that periglacial processes are active in 'glacial' landscapes and that both contemporary and relict landscapes have been formed by both 'sets' of processes.

So in summary – The same physical processes e.g. abrasion will create different landforms in different circumstances and environments. Some glacial landscapes, especially in upland regions are far more striking and distinctive than either lowland glacial or periglacial landscapes. Many landscapes and the landforms that constitute them are a product of both glacial and periglacial processes. The reasons for the differences are best addressed in terms of the nature of the processes, their energy and the rate of change as well as the nature of the pre-glacial landscapes determined by rock type, altitude etc.

The best answers will address this showing a strong conceptual understanding and the use of cogent argument and counter argument explicitly addressing 'best explained' with a range of reasons offered for contrasts based on a wide range of different processes linked to landform/landscape formation. Conclusions will 'come to a view'.

Case studies used are likely to include:

1. Upland relict glaciated regions of the UK (the Lake District, Snowdonia) or active / relict Europe (Alps)
2. Lowland landscapes, e.g. East Anglia
3. Periglacial landscapes, e.g. Alaska

QUESTION 3 'Strategies for increasing global food supply are inevitably unsustainable'. Discuss.

• Explore how different ways of increasing global food supply have different degrees of sustainability.
• Research contrasting ways of increasing food supply to cope with rising demand.

INDICATIVE CONTENT

The focus of this title is the negative impact of increases of both the area that is farmed and the intensity of agricultural practices.

The framework chosen may be by:

1. Different examples of farming practice that increases output per hectare; 'Green Revolution', use of genetically modified crops etc. – agribusiness, land 'grabs' in Africa and South America
2. Different impacts from eutrophication through to desertification
3. A 'case-study' approach by area/region – cattle ranching on the High Plains – Lake Chad etc.
4. A theoretical approach – Malthus v Boserup

Restrictions –'food' production is most obvious one – some might stray into non-food crops. '....global' is another – be watchful for students who discuss local schemes without adequately linking them to total global production.

NB – There is a 'ghost' restriction here too – although most students will read 'unsustainable' in terms of environmental sustainability there is no necessity for them to limit themselves in this way – it is perfectly acceptable for them to investigate and comment on the social and or economic impacts of increasing food supply.

Key analytical points:

- There is clearly a global 'problem' – most farming changes over the past century have had negative environmental impacts.
- These impacts are likely to include:
  1. Mechanisation of agriculture leading to increased fossil fuel usage.
  2. Increasing use of artificial fertilisers leading to eutrophication of both freshwater and marine environments.
  3. Increasing uses of herbicides and pesticides have had negative impacts on the biosphere.
  4. Inappropriate extension of commercial farming in some regions has lead to loss of biodiversity, e.g. soya/corn replacing rainforest.
  5. Desertification is often a secondary consequence of pushing subsistence farmers onto marginal land and thus overgrazing.
  6. Genetic modification allows crops to be grown in 'new' regions with unpredictable impacts on the environment – the environmental 'threat' of GM crops remains highly controversial.
  7. Intensive livestock production creates waste and has impacts on groundwater quality and quantity as well as increasing global methane production.
  8. Increasing demand for rice production has increased methane production.
- Social and economic impacts that lead to unsustainability might

include:

1. Loss of rural communities as agribusiness grows.
2. Hyper-urbanisation as rural to urban migration leads to growth of slums and squatter settlements.
3. Increasing dependency on global supply chains for food products.

- Students should recognise that food production is now global with very few parts of the world sitting outside a global supply chain – this has implications for the environment – this might be illustrated by land deals made in Africa, e.g. with China/Saudi Arabia etc.
- Key question is 'inevitability' of this. This may stimulate a discussion about alternative vision.
- Changes which have not had such negative impacts are often small-scale and, crucially, do not always **increase** food output; indeed they are not always intended to do so.

So in summary – 'Inevitable' means unavoidable – it is clearly **not** the case that all attempts to increase food supply are unsustainable but the focus is on 'global food supply', so although one might argue that smaller scale schemes to increase food supply (such as urban farms) are certainly sustainable. The scale of the global problem for supply does pose real challenges for the environment and the picture, to date, is not good. However, 'inevitable' is really quite an extreme position to take up given the possibility of technological breakthroughs. So the best answers will show a strong conceptual understanding and cogent argument and counter argument with a range of reasons offered why the environment is impacted negatively. They will show an appreciation of different and clearly identified values/perspectives on the 'inevitability' of a negative impact supported by evidence/example. Their conclusions will be clearly stated with explicit references to title and obvious view taken about success with some evaluation of the problems of definition.

Case studies used are likely to include:

1. GM crops in specific location, such as South America; other non-GM ways of increasing commercial agriculture / intensification.
2. The GR revolution in South and South East Asia, and perhaps the lack of / attempt to develop this within Africa.
3. Intermediate technology / bottom-up / small-scale approaches to increasing food production / distribution / storage and utilisation.
4. Specific examples of 'land grabs'.

QUESTION 4 To what extent is it true that the least culturally diverse places are the most geographically isolated?

• Explore the physical and human factors which influence the degree of cultural diversity.
• Research a range of contrasting locations to illustrate how cultural diversity varies from place to place.

INDICATIVE CONTENT

The focus of this title is whether or not there is a correlation between cultural diversity and 'isolation' with the emphasis on poorly connected places.

The framework chosen may be by:

1. Case studies of different societies/places with contrasting levels of cultural diversity.
2. Contrasting attitudes towards cultural diversity.

Restrictions – 'Geographically' isolated as opposed to isolation in general – 'places' rather than countries.

Key analytical points:

- Geographical isolation is one factor that helps explain lack of cultural diversity.
- This needs some definition – it could be distance but better seen as a combination of that and other factors such as difficulty of access (e.g. interior Bolivia/Ecuador), and whether it is a place that is passed through to reach others.
- It is something of a tautology that prior to modern communication systems many societies were relatively homogenous culturally.
- Exceptions were ports and contested regions that experienced frequent changes of nationality.
- Colonialism was also a major factor in diluting differences between cultures.
- However there are examples of connected places that have remained culturally homogenous – Japan is the best known example, Iceland is another (although much more recently connected).
- In the case of Japan it is cultural attitudes that determine lack of diversity – in the case of Iceland it is more to do with limited opportunities for immigrants.
- Cultural diversity varies within countries with a marked urban/rural contrast in most countries.
- In most cases this is explained by geographical factors although social and political factors also play a part – for example the least culturally diverse cities in the USA used to be southern and mid-western cities.
- London is the UKs most ethnically and culturally diverse city, as New York is in the USA
- Culturally diverse places are often clearly demarcated on the ground with particular districts dominated by one group or another.

So in summary – Isolated places tend to lack cultural diversity but isolation is not simply a product of geography but also a function of attitudes both on the part of governments and society as a whole. The answer is thus a very conditional 'yes' but with major qualifications and dependent on a thoughtful interpretation of

'geographical isolation'. So the best answers will demonstrate a strong conceptual understanding using cogent argument and counter argument over causes of diversity/homogeneity with a range of reasons offered for variations in cultural diversity. They will demonstrate an appreciation of different and clearly identified values/perspectives in determining cultural homogeneity. Their conclusions will be clearly stated with explicit references to title and obvious view taken about the role of geographic isolation.

Case studies used are likely to include:

1. Japan/UK
2. Iceland
3. London
4. Tuvalu
5. Amish country
6. Rural- urban contrasts

QUESTION 5 To what extent is the level of health risk best explained by socio-economic status?

- Explore the role of physical and human factors in explaining variations in the levels of health risk.
- Research a range of examples to show how health risks vary between and within countries.

INDICATIVE CONTENT

The focus of this title is the degree to which socio-economic status, in a range of spheres, can be held accountable for variations in health risk from place to place and from time to time.

The framework chosen may be by:

1. Different causes of health risk including environmental factors, socio-economic status and geographic factors.
2. Models of health risk (ETM, Kuznets).
3. By disease e.g. malaria, TB, obesity
4. By place using case-studies to carry the ideas.

Restrictions – 'level' needs spotting as in how bad it is.

Key analytical points:

- Health risk can be expressed in two dimensions – geographic extent and threat to individuals so both breadth and depth of risk.
- The best, indirect, measure is probably life expectancy.
- Major killing diseases are largely determined by poverty and limited access to basics such as clean water and sanitation.
- 'Socio-economic status' is a phrase that needs deconstructing carefully – some students will include, reasonably enough, health risks associated with quality of built environment, sewage disposal and lack of access to freshwater.
- These latter causes are closely related to levels of development and the availability of inoculation.
- Poorer countries have lower life expectancy
- Poorer people have lower life expectancy
- Some diseases (obesity) may be a product of development suggesting an inverse relationship between development and health risk.
- Air quality in Chinese cities is an obvious health risk which is a product of development, that is both broad and potentially deep (too early to tell about death rates).
- But the hazards of cooking with wood in a confined space in Indian villages is also serious.

So in summary – The most significant variable explaining variations in life expectancy is GDP per capita – this works better within countries than between them. The reasons are related to the environment both directly as in the threat posed and indirectly as in, critically, the ability to deal with it. Malaria is an excellent example of this complex relationship. The best answers will use a strong conceptual understanding and cogent argument and counter argument with a range of reason offered for the role of socio-economic status. They will demonstrate an appreciation of different and clearly identified arguments about the relationship between environmental factors and other factors such as poverty.

Their conclusions will be clearly stated with explicit references to title and obvious view taken about the role of socio-economic status when compared with others.

Case studies used are likely to include:

1. China's polluted cities
2. Indian villages
3. Malaria in Africa
4. Obesity in Europe
5. Counter-evidence from Chernobyl/Bhopal

QUESTION 6 - 'Some rural landscapes are more vulnerable to the impacts of leisure and tourism than others'. Discuss.

• Explore the fragility of different rural landscapes and their resilience to the demands of both leisure and tourism.
• Research contrasting rural landscapes which illustrate a variety of impacts from leisure and tourism.

INDICATIVE CONTENT

The focus of this title is the reasons for vulnerability which are in part a consequence of the nature of that landscape, its inherent stability and resistance to change in other words its fragility – but also the level of the disturbing agents, often human and, of course, the management of that threat.

The framework chosen may be by:

1. Contrasting type of rural landscapes – a range of case studies of different landscapes showing how some are more likely to be damaged than others
2. Type of tourism – the pressure exerted rather than the vulnerability of the landscape
3. Type/level of impact using degree of impact as the controlling variable
4. Types of management – level of fragility may be controlled by the sensitivity of management

Restrictions – 'rural' of course but unlikely to be an issue – 'landscapes' rather than small parts of a landscape, i.e. footpaths.

Key analytical points:

- Vulnerability needs to be understood as a consequence of the stability of a landscape – mountain areas are more fragile than lowland areas because less energy is required to stimulate a change.
- But levels of threat also control that – if threats are severe then ability to recover is reduced.
- So analysis will focus on the nature of landscapes and the human threats.
- Stability needs to be considered.
- May draw in 'wildernesses' as especially fragile given limited historical exposure to human threats, e.g. Antarctica.
- Carrying capacity and resistance are important tools in exploring fragility.
- Natural events can threaten fragile environments – impact of hazards.
- One of the main threats to the most fragile landscapes is leisure and tourism.
- But others include urban growth, intensive agriculture and climate change.
- Potentially fragile environments in the developed world are subject to greater protection than many in the developing world.
- Much is explained by the value attached to landscapes and the economic benefit that they offer tempered by their (frequently un-costed) benefit.

So in summary – Some landscapes are more vulnerable than others because they are more or less fragile but also the pressures vary from place to place, both human and natural. The best answers will address this showing a strong conceptual understanding and the use of cogent argument and counter argument with a range of reason offered for varying vulnerability. They will demonstrate an appreciation of different and clearly identified values/perspectives on what constitutes vulnerability and how it can be evaluated. Their conclusions will be

clearly stated with explicit references to title and obvious view taken about the reasons for varying fragility with extended points made.

Case studies used are likely to include:

1. Alaska
2. Yorkshire moors
3. Formby sand dunes
4. Bryce canyon
5. Antarctica

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