Mark Scheme (Results)
January 2011

GCE

GCE Geography (6GE03) Paper 1

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General Guidance on Marking

All candidates must receive the same treatment.

Examiners should look for qualities to reward rather than faults to penalise. This does NOT mean giving credit for incorrect or inadequate answers, but it does mean allowing candidates to be rewarded for answers showing correct application of principles and knowledge.

Examiners should therefore read carefully and consider every response: even if it is not what is expected it may be worthy of credit.

Candidates must make their meaning clear to the examiner to gain the mark. Make sure that the answer makes sense. Do not give credit for correct words/phrases which are put together in a meaningless manner. Answers must be in the correct context.

Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the Team Leader must be consulted.

Using the mark scheme

The mark scheme gives:
- an idea of the types of response expected
- how individual marks are to be awarded
- the total mark for each question
- examples of responses that should NOT receive credit.

Quality of Written Communication

Questions which involve the writing of continuous prose will expect candidates to:

- show clarity of expression
- construct and present coherent arguments
- demonstrate an effective use of grammar, punctuation and spelling.

Full marks will be awarded if the candidate has demonstrated the above abilities.

Questions where QWC is likely to be particularly important are indicated "QWC" in the mark scheme BUT this does not preclude others.

SECTION A

Question Number	Question
1a	Suggest possible consequences for **people** and the **environment** of the projected changes in water withdrawals. **(10)**
	Indicative content
	Expect some description but the focus should be on **consequences.** Key changes shown are very large absolute increases in Asia, and increases in all other regions. The developing world increase is large in absolute terms; the developed world is smaller in absolute and relative terms. Even though the absolute increases are small in Africa and Latin America the relative increases are large e.g. 67% in SSA. Consequences for people are likely to be: • Positive as water supply rises, although this could be offset by population rises in some regions such as Asia and Africa. • Improvements could be seen in sanitation, water borne disease levels (malaria, cholera), health and general welfare. • Some increased withdrawals could be used to support growing industries and others might result from better water infrastructure. • Some could see increased potential for conflict, especially in Asia where huge increases are projected and may come from trans-boundary catchments and aquifers. • Over the longer term some sources may be over-abstracted to the point they can no longer sustain use. Consequences for the environment could be wide-ranging and often negative such as: • Increased diversion and control of rivers, with some running dry or at much lower levels – with consequences for ecosystems. • Drying out of marshlands and wetlands as water is diverted to human supply. • Increased construction of dams and other water infrastructure with consequences for ecosystems and the landscape. Credit details of examples in support of the discussion.

Level	Mark	Descriptor
Level 1	1-4	Descriptive account with a few statements of problems and issues, likely to be unbalanced and lacking clarity. Structure is poor or absent. Geographical terminology is rarely used with accuracy. There are frequent grammar, punctuation and spelling errors.
Level 2	5-7	Some range of consequences for humans and the environment but may lack balance between the two; consequences not always in depth. Structure is satisfactory. Geographical terminology is used with some accuracy. There are some grammar, punctuation and spelling errors.
Level 3	8-10	Balanced coverage of consequences for people and environment and may see positive and negative sides; likely to be supported by examples. Structure is good. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are rare

Question Number	Question
1b	Using examples, assess the role of named players in securing water supplies. **(15)**
	Indicative content
	A very wide range of **players** could be covered; do not expect coverage of all even in L4 although a range is required. • Governments – provide strategic direction and may sponsor large scale projects such as Spain's Ebro diversion and the Chinese South-North project; they also have a role in over-coming international disputes along with IGOs. In addition IGOs such as the WB/IMF often provide financing for large scale water developments especially in the developing world. Some might see some of these players as lacking a sustainable direction due to the big project / debt approach. Governments may become involved during a 'crisis' such as the 1976 or 2003 droughts. • NGOs – likely to be seen as more sustainable by focussing on small scale projects; role is especially important in the developing world where their projects often make a real difference albeit very locally. • Pressure groups / environmental organisations – raise awareness and campaign to reduce waste or block projects which are seen as not sustainable. • Water companies – complex role due to profit motive, however in developed countries they may be seen as the key player in providing safe, clean water – infrastructure investment is key to reducing wastage; water metering may be mentioned. Big business / TNCs might be mentioned as consuming too much / not caring. • Consumers – have a key role in managing consumption as buyers of water and buyers of water saving devices. They have to be convinced of the need to be sustainable in order to change consumption behaviour. • Individuals – in the developing world many people secure their own supply, or act as a vendor. Many use water unsustainably due to lack of alternatives. There are others, which should be credited where relevant. Max Level 2 if only 1 player, or **projects** rather than players.

Level	Mark	Descriptor
Level 1	1-4	A few general comments on players, lacks a focus on role. Structure is poor or absent. Explanations are over simplified and lack clarity. Geographical terminology is rarely used with accuracy. There are frequent grammar, punctuation and spelling errors.
Level 2	5-8	Some mention of players and their roles but unbalanced and lacking depth; cursory use of examples. Structure is satisfactory. Explanations are clear, but there are areas of less clarity. Geographical terminology is used with some accuracy. There are some grammar, punctuation and spelling errors.
Level 3	9-12	Range of players and their roles and some use of examples in support and there is implied assessment of some players. Structure is good. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are rare.
Level 4	13-15	Clear assessment of the role of a range of players in securing water supplies; well supported by examples. Carefully structured. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are very rare.

Question Number	Question
2a	Suggest reasons for variations in the percentage of protected **terrestrial** and **marine** areas. **(10)**
	Indicative content
	There is a range of possible **reasons** for the **variations:** Level of development / wealth: • Some might attempt to comment using a North-South structure relating degree of protection to level of development and therefore economic resources to protect areas. • There is some evidence of this especially for marine protection (NZ/ Aust & North America) but it is less clear for terrestrial areas – South Asia and West Central Africa have low protection % but so does Australia/ NZ and SE Asia whereas it is high in Europe. Marine areas might be seen as costly to police and protect. Value of ecosystems and biodiversity • Value might be as a result of cultural perceptions or more likely because ecosystems are used for tourism – this could explain Africa's relatively high terrestrial % - for Safaris etc. Certain locations such as the Great Barrier Reef might be seen as iconic and therefore protected. • In some locations such as Australia many areas may not be protected because they are wildernesses which are not considered very valuable or are simply not threatened. • Marine areas in Asia may be seen as too economically valuable to protect e.g. for diving, fishing or aquaculture. • The concept of 'protected' varies from place to place Threats • Areas which are deemed as under threat e.g. TRF might be protected perhaps explaining the 21% terrestrial protection in South America • Good students might see much of this area as a 'paper park' making the point that designation does not equal protection. Areas in Europe may be smaller than South America but better protected. Campaigns / pressure to protect certain areas that are seen as iconic and / or especially important (even globally so) Accept other reasonable suggestions.

Level	Mark	Descriptor
Level 1	1-4	A few general comments, largely descriptive – focus is on one idea such as N/S divide. Structure is poor or absent. Geographical terminology is rarely used with accuracy. There are frequent grammar, punctuation and spelling errors.
Level 2	5-7	Some range of reasons but with variable depth; some coverage of the table and may use examples in support. Structure is satisfactory. Geographical terminology is used with some accuracy. There are some grammar, punctuation and spelling errors.
Level 3	8-10	Range of reasons in some depth. Comments on the information and uses examples to support points. Structure is good. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are rare

Question Number	Question
2b	Using examples, assess the relative importance of human and physical factors in influencing levels of biodiversity **(15)**
	Indicative content

Human

- Protection – humans can preserve, or even enhance biodiversity through conservation and protection; zoos and restoration could have a positive impact on areas where biodiversity has decline and protected areas help maintain biodiversity.
- Destruction – a huge range of threats both deliberate (deforestation, overfishing etc) and accidental (introduced invasive species, pollution sources such as DTT and nitrates) can degrade biodiversity. Expect examples of both degradation and protection.
- Some might take a population density / level of development approach here i.e. urbanisation encroaching on ecosystems.

Physical

- Climate Change – credit this as either human or physical, depending on how it is argued; shifts in vegetation zones related to the Arctic or other areas, increasing sea temperatures leading to bleaching and other examples.
- Endemism – important in particular locations; the hotspot 'highlands and islands' might be mentioned as might some details on evolutionary processes.
- Age of an area, if undisturbed, generally leads to higher biodiversity.
- Small scale factors such as altitude, soils, number of niches.
- Limiting factors - the most biodiverse areas in general are those where life thrives due to a lack of limiting factors (water, warmth, sunlight, CO2) such as in coral reefs and TRF; the reverse is also true in extreme environments.
- There are others, if in doubt consult any A2 textbook.

Better students should move towards as assessment of the human and physical factors i.e. that the global pattern is determined by physical factors but the actual levels today are strongly influenced by local, and increasingly global, threats. Some students may structure their answer by scale i.e. global/regional/local areas with factors for each.

Level	Mark	Descriptor
Level 1	1-4	A few general ideas in an unbalanced account, likely to focus narrowly on one factor. Structure is poor or absent. Explanations are over simplified and lack clarity. Geographical terminology is rarely used with accuracy. There are frequent grammar, punctuation and spelling errors.
Level 2	5-8	Some range of factors covered but not in depth; lacks balance between human and physical / may not differentiate. Exemplification limited. Structure is satisfactory. Explanations are clear, but there are areas of less clarity. Geographical terminology is used with some accuracy. There are some grammar, punctuation and spelling errors.
Level 3	9-12	Range of factors explained, some in more depth and there is some use of examples. May imply relative importance of physical versus human. Structure is good. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are rare.
Level 4	13-15	Range of physical and human factors in a balanced account supported by examples; assesses the relative importance – likely to include a summative statement. Carefully structured. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are very rare.

Question Number	Question
3a	Suggest how the three scenarios for 2025 might have very different consequences for the **planet** and its **people. (10)**

Indicative content

The **globalised scenario**

- Is very much like today.
- It depends on the continued dominance of the USA.
- Consequences for the planet are likely to be continued global warming and environmental problems due to high resource consumption (USA consumes around 25% of global resources)
- For people it may be argued that a stark wealth / poverty divide will persist; cultural globalisation / imperialism may expand. Exploitation by TNCS,

The **governance scenario:**

- Suggests a better world with a reduced role for the USA but a global focus on tackling climate change – with positive impacts on pollution levels, ecosystems, possibly water supplies and other environmental issues.
- From a human perspective perhaps improved human wellbeing and increased equality – enhanced role of the UN (humanitarian issues dealt with)

The Multi-polar world:

- May seem more dangerous and fragmented with the potential for cultural and actual conflict as a number of powers jostle for position
- Some may do better i.e. growing wealth in the BRICs but perhaps dependency elsewhere and even lower living standards in the EU and USA.
- Some will argue this future suggests even greater resource use and abuse, and a lack of a global focus on environmental issues.

The focus should be on consequences for **people** and the **planet**, not how likely (or not) the different scenarios are.

Watch for direct lift-offs

Level	Mark	Descriptor
Level 1	1-4	A few general ideas, may be somewhat sensationalist and lacking focus; may concentrate on one future only. Description of Fig 3 not explanation. Structure is poor or absent. Geographical terminology is rarely used with accuracy. There are frequent grammar, punctuation and spelling errors.
Level 2	5-7	Covers several futures; may be unbalanced and may focus more on people or planet; some sound ideas and may use some examples. Structure is satisfactory. Geographical terminology is used with some accuracy. There are some grammar, punctuation and spelling errors.
Level 3	8-10	Considers the 3 futures, and people and planet; sound explanations. Structure is good. Likely to use examples. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are rare

Question Number	Question
3b	Evaluate the need for superpowers to play a key role in **trade** and **international decision making** to maintain their status**. (15)**
	Indicative content
	Expect the focus to be on trade and international decision making but some students may choose to examine other important pillars of superpower status such as military power or cultural influence. This should be in addition to coverage of trade and international decision making. • **Trade** is important as it is often seen as the engine of growth; terms of trade tend to be skewed in favour of superpowers through control of commodity prices and production of high value-added goods • The role of **trade blocs** such as NAFTA and the EU is important in generating internal free trade while maintaining aspects of protectionism. Expect some use of examples such as Banana wars or Malian cotton. • The **WTO** might be seen as a bridge between the two parts of the question; influence in the WTO is related to economic power and so it could be seen as self-serving. • **International decision making** relates to a whole range of bodies such as the **UN, IMF, OECD, NATO** etc. • These are often dominated by the developed countries such as the UN Security Council and IMF voting power. • Weaker countries and smaller regional blocs have a hard time 'getting their way' • Some international bodies are less formal but not necessarily less important such as the **G8** and **WEF** (World Economic Forum) – these allow leaders of the superpowers / emerging powers an influence over economic policy that others do not have access to. Expect some reference to specific organisations, countries and events to illustrate the argument.

Level	Mark	Descriptor
Level 1	1-4	A few general ideas relating to superpowers but no real world detail; Structure is poor or absent. Explanations are over simplified and lack clarity. Geographical terminology is rarely used with accuracy. There are frequent grammar, punctuation and spelling errors.
Level 2	5-8	Some coverage of trade and /or international decision making but unbalanced e.g. explains how trade generates wealth. Structure is satisfactory. Explanations are sometimes clear, but there are areas of less clarity. Geographical terminology is used with some accuracy. There are some grammar, punctuation and spelling errors.
Level 3	9-12	Covers both trade and decision making and has some detail / use of examples – focus is on superpower status and there is some implied evaluation. Some use of countries / examples. Structure is good. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are rare.
Level 4	13-15	Genuine evaluation of trade and decision making, well supported by real world detail and examples; may address other ways of maintaining power. Carefully structured. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are very rare.

Question Number	Question
4a	Suggest how the information shown can be considered as both **good** and **bad news** for the developing world**. (10)**

Indicative content

There should be coverage of **good** and **bad news** but do not expect complete balance.

Good news

- Overall, aid to the developing world has risen, suggesting wealthy countries are becoming more generous – some may mention the 0.7% OECD/DAC target; aid may be helping meet the MDG.
- Debt relief has risen, especially after 2004 (Gleneagles summit / HIPC initiative) which may mean developing countries have more resources to spend on improving healthcare / education etc (cynics may say arms etc)
- Aid from NGOs has risen although it is a small % of the total – some may argue this means more 'good' aid i.e. community based, bottom-up, sustainable.

Bad news

- Overall aid is little changed from 1990 perhaps $95 billion in 2007 compared to $77 in 1990; some might argue economic growth has been much more than this and population growth may actually mean less aid per person. Aid actually fell 1990-1997.
- Debt relief spiked in 2005 and has since fallen back – this may mean the problem is 'solved' although many would argue this is not the case at all.
- Bi-lateral aid and multi-lateral aid have risen, but some may argue much of this will be tied, or simply lead to more debt.

Consider any other valid explanations and reasons for the changes.

Level	Mark	Descriptor
Level 1	1-4	A few general comments; may see only 'good' news in overall rise. Lacks real world understanding of aid/ may not differentiate. Structure is poor or absent. Geographical terminology is rarely used with accuracy. There are frequent grammar, punctuation and spelling errors.
Level 2	5-7	Some range of suggestions for both good and bad, but unbalanced; may cover only some types. May use some examples. Structure is satisfactory. Geographical terminology is used with some accuracy. There are some grammar, punctuation and spelling errors.
Level 3	8-10	Balanced range of good and bad suggestions across the graph, covers most types of aid; likely to use some brief examples in support. Structure is good. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are rare

Question Number	Question
4b	Using named examples, evaluate the success of **two** contrasting strategies used to narrow the development gap**. (15)**
	Indicative content
	Candidates should choose two strategies which contrast, the contrast could be in terms of: • scale (large versus small) • approach (top-down versus bottom up) • funding / organisation (government versus NGO) • technology (hi-tech versus intermediate) • vehicle e.g. trade, aid, tourism, FDI The focus should be on narrowing the development gap. Stronger responses (L3/L4) should: • Have detail e.g. discussion of fair-trade as a strategy illustrated by a named fair trade project • Appropriate examples i.e. Three Gorges Dam is hi-tech not intermediate technology. There could be a focus on: • The MDGs - although this is likely to be generalised unless specific to a goal / country. • Globalisation which could be an overview unless focussed on specifics of FDI in named locations e.g. China. • Specific NGO development projects focussed on farming or income generation • Fair trade schemes such as Divine chocolate etc • Large scale 'Three Gorges' type approaches …plus many others Evaluation should focus on the success of each strategy in narrowing the gap i.e. raising incomes and getting people out of poverty (or not).

Level	Mark	Descriptor
Level 1	1-4	A few generalised ideas on one or two projects, lacking detail. Contrast not made clear. Structure is poor or absent. Explanations are over simplified and lack clarity. Geographical terminology is rarely used with accuracy. There are frequent grammar, punctuation and spelling errors.
Level 2	5-8	Descriptive account of two projects linked to development; contrast and evaluation not clear. Structure is satisfactory. Explanations are clear, but there are areas of less clarity. Geographical terminology is used with some accuracy. There are some grammar, punctuation and spelling errors.
Level 3	9-12	Exemplified account of two contrasting strategies partly linked to narrowing the gap; evaluation implied. Structure is good. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are rare.
Level 4	13-15	Clear evaluation of two contrasting exemplified strategies with good linkage to the idea of narrowing the gap. Carefully structured. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are very rare.

Question Number	Question
5a	Examine the factors that may have influenced the global pattern of internet use shown. **(10)**
	Indicative content
	There will be a tendency for some students to focus largely on the North-South divide as an explanation but Figure 5 is not a map of income, therefore a range of factors need to be used to explain the pattern. Examples of factors include: • At a global level there is a strong link to **level of development** with richer countries tending to have greater use e.g. North America and Europe with 60-80% compared to South Asia and central Africa with 0-10%; costs may be an issue in some countries despite being relatively wealthy (broadband, ISP costs); NICs in between. • **Political factors** may play a role – the low % of 10-20% for China and 'no data' for North Korea reflect censorship; on the other hand government policies such as encouraging rural broadband might increase coverage. Vietnam has no restrictions on internet use and a high % of use for the region; level of government investment and government policy • Proximity to internet cabling / fibre optic routes • Some regions such as Sub-Saharan Africa lack **precursor technologies** such as telephone lines, electricity and actual PCs therefore internet access in likely to be low • **Physical constraints** such as landlocked states – Paraguay, Bolivia, and Nepal - may struggle to put in place the connectivity infrastructure needed; small nations such as Taiwan, UAE and Israel may be easier to connect up and therefore increase access. • A **service sector economy** such as Japan, EU and North America will demand connectivity in the information age

Level	Mark	Descriptor
Level 1	1-4	A few general ideas, likely to focus on NS divide explanations and lacks detail on internet specifically; descriptive of map. Structure is poor or absent. Geographical terminology is rarely used with accuracy. There are frequent grammar, punctuation and spelling errors.
Level 2	5-7	Some range of ideas, relating to level of development and some specifics relating to the internet; some references to specific countries / anomalies. Structure is satisfactory. Geographical terminology is used with some accuracy. There are some grammar, punctuation and spelling errors.
Level 3	8-10	Detailed explanation of a range of factors using the map and specific countries. Structure is good. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are rare

Question Number	Question
5b	Using named examples, assess the effectiveness of **technological leapfrogging** in contributing to the development process. **(15)**
	Indicative content
	Leapfrogging means adopting a technology without pre-cursor technologies being adopted first. Well known examples are GM crops (and to some degree GR crops), mobile phones and computers, or adoption of solar or micro-hydro electricity generation without the intermediate fossil fuel stage. Accept a range of other examples. Many will focus on GM and mobile phones as these are named in the spec. Effective • As the name suggests, the idea is to 'jump' a stage in development; in the case of mobile phones the high cost of developing a landline network is avoided and the connectivity achieved at a much lower cost • In the case of GR crops a huge boost in production, and food security was achieved compared to traditional farming • Leapfrogging technologies (other than farming) tend to be mobile and can be set up anywhere so the capital cost is fairly low and they can be expanded quickly into a 'net' (Wifi and mobile) or simply placed where needed (solar) • Many communication technologies rely on electricity which must be provided somehow Less effective • Dependency may be an issue as much of the technology is 'western' – although in India local people have rapidly adapted by setting up mobile phone and laptop charging stations using car batteries. • The consequences may not be fully clear when the technology is adopted as with GM and GR crops; technology designed for the 'west' may not deliver unless the correct conditions are used. • GM and GR have socio-economic and environmental downsides which may be outlined • Even low costs can prove too high in some locations, such as the One Laptop Per Child project.

Level	Mark	Descriptor
Level 1	1-4	A few general statements on some technologies e.g. the advantages of mobiles to Indians. Structure is poor or absent. Explanations are over simplified and lack clarity. Geographical terminology is rarely used with accuracy. There are frequent grammar, punctuation and spelling errors.
Level 2	5-8	Some ways technological leapfrogging contributes to development, but lacking assessment. Structure is satisfactory. Explanations are clear, but there are areas of less clarity. Geographical terminology is used with some accuracy. There are some grammar, punctuation and spelling errors.
Level 3	9-12	A range of ways technological leapfrogging contributes to development with some examples and details; begins to assess effectiveness. Structure is good. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are rare.
Level 4	13-15	Detailed, supported assessment of effectiveness using a range of examples; may provide an overview. Carefully structured. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are very rare.

SECTION B	
Question Number	Question
6a	Explain why there are growing concerns about North America's **energy security. (12)**

Indicative content

There are a number of political and economic reasons for growing concern, as well as the obvious problem that some supplies are finite.

- Energy is crucial to the North American **economy** and projections suggest it will continue to be so in the future; projections show strong forward demand so secure supplies are vital.
- The setting up of the **NAEWG** in 2001 might be seen as evidence of concern at inter-government level.
- Traditional, easy to access fossil fuel reserves in North America are **running out** – oil production peaked years ago in the USA and seems to have done so in Mexico around 2005; natural gas production is rising but demand exceeds supply in the USA. The USA has ample coal reserves but there must be concerns over its use (Kyoto/Bali).
- Dependency on **imports** is rising; North America increasingly has to compete with China, India and others and very high prices (as in 2008 and 2011) could undermine the economy. Import **dependency** is worrying because of energy flows could be hijacked by war, conflict, piracy or other supply interruptions (Figure 4).
- Nuclear power is important in the USA and Canada but the two countries face a **'gap'** between the closure of older plants and opening of those ordered in the past few years; **high costs** are a concern, as is the proliferation of nuclear material.
- The pressure to develop an alternative to fossil fuels means that coal might be risky to develop.

The focus should be on **concerns,** but credit candidates who go on to present reasons for concerns being reduced e.g. the development of shale gas resources, or the possibility of new oil field being developed. (synoptic)

NB for good Level 3 the answer needs to go beyond one country in North America e.g. recognising differential security

Synoptic linkages

- Unit 1 globalisation and a global energy market; trade blocs and the importance of cross border energy transfers
- Unit 3 superpowers and the desire of the USA to maintain its position; the stresses placed on the unipolar system by the rise of the BRICS
- Unit 1 climate change and the pressures to mitigate emissions

Level	Mark	Descriptor
Level 1	1-4	A few ideas on some narrow aspects of energy security such as 'peak' fossil fuels. Structure is poor or absent. Lift-offs from RB. Explanations are over simplified and lack clarity. Geographical terminology is rarely used with accuracy. There are frequent grammar, punctuation and spelling errors.
Level 2	5-8	Explains some range of factors / concerns with variable detail; effective use of the resources. Structure is satisfactory. Explanations are clear, but there are areas of less clarity. Geographical terminology is used with some accuracy. There are some grammar, punctuation and spelling errors.
Level 3	9-12	Good range of reasons / concerns making good use of resources and own knowledge; good focus on security. Structure is good. Explanations are always clear. Synoptic links. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are very rare.

Question	
6b	Evaluate the arguments for and against large scale development of **unconventional** and **technically difficult** fossil fuel sources in North America. **(14)**

Indicative content

The question is largely one about the need to develop energy sources versus the need to conserve and avoid pollution. Candidates could use a social, economic and environmental structure, or structure by source. Figure 7 outlines three types of unconventional resource. The Canadian tar sands are under development already, but there has only been tentative exploration of the USA oil shales; deep water Mexican oil is less unconventional but it is challenging and costly to exploit.

- All three sources only become economic at a relatively high oil price (Figure 7) so there is an economic argument against development so long as supplies can be obtained cheaper elsewhere.
- On the other hand if technology could be reduced to reduce extraction cost the potential to secure supply is huge – political pressures in all three countries are present to develop, and oil majors are interested.
- There is some evidence that Mexican oil production is collapsing rapidly and new fields would help.
- The fossil fuel reserves could come on stream quickly compared to nuclear plants, and they do not suffer the reliability issues of some renewable sources.
- Tar sands and oil shales are hugely energy intensive; large amounts of energy need to be used in extraction creating a double hit of CO2 emissions unless the extraction energy was renewable – in Canada it is largely natural gas which could be seen as hugely wasteful.
- Some might argue that clean coal and CCS would be cheaper and more realistic that oil shales, and is also technologically difficult.
- The impact on ecosystems of development could be very large; especially if forms of strip mining are used; the impact of deep oil in Mexico is much lower as the 'footprint' of extraction is much smaller.

Expect good students to cover all three sources although not in equal depth and perhaps move towards a conclusion.

Candidates may move into other unconventional and technically difficult resources they have researched within North America e.g. oil in the ANWR or shale gas.

NB: the BP spill in 2010, as well as other examples of deep water spills could be used to illustrate the environmental costs of deep water oil (synoptic)

Synoptic linkages

- Unit 3 Biodiversity – expect details of impacts on forests and marine ecosystems as the resources point to these.
- Unit 4 Rural landscape and the impact on wilderness areas.
- Unit 3 superpowers and the maintenance of status
- Unit 1 climate change; arguments for leaving the fossil fuels alone.

Level	Mark	Descriptor
Level 1	1-4	A few general ideas on a narrow range; limited use of resources / lift offs; may describe the nature of the fossil fuel stocks. Structure is poor or absent. Explanations are over simplified and lack clarity. Geographical terminology is rarely used with accuracy. Frequent grammar, punctuation and spelling errors.
Level 2	5-7	Some ideas but likely to be unbalanced for / against and focus on some aspects of Figure 7 only. Structure is satisfactory. Explanations are clear, but there are areas of less clarity. Geographical terminology is used with some accuracy. There are some grammar, punctuation and spelling errors.
Level 3	8-11	Range of ideas as well as effective use of resources; some balance for and against. Begins to evaluate. Structure is good. Some reference to wider links / synopticity. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are rare.
Level 4	12-14	Good range of ideas using resources; balanced and likely to take an overview and provide a clear evaluation. Carefully structured. Strong synoptic links. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are very rare.

Question Number

6c Assess the contribution **renewable energy** could make in securing North America's energy future**. (14)**

Indicative content

Accept the usual range of renewable sources, as well as nuclear. The only energy sources that cannot be credited are fossil fuels. Better responses may justify their inclusion of nuclear / comment on its status.

A range of sources could be discussed; expect a range but not necessarily everything here:

- **Nuclear** – high cost, safety concerns and long lead in times set against 'friendly' sources of Uranium and reliability; some might argue the issue of waste disposal has never been fully dealt with.
- **Biofuels** – very much pushed under Bush, they have a questionable environmental record and may lead to rising food prices. Second generation technologies may offset this to some degree; they fit into the current distribution and use network.
- There is huge potential for **wind, solar** and **geothermal** in North America but it is physically constrained and suffers from reliability issues; it may not be placed where the power is actually needed; wind has very high potential. **Tidal** might be mentioned in the context of the Bay of Fundy.
- **Costs** are likely to fall in the future, especially for solar and wind as technology develops. Currently the costs of different renewable sources are variable – some are more viable than others.
- Credit alternative arguments such as the need for greater efficiency which would offset the need for new energy sources.
- Also credit researched ideas not in the resources such as hydrogen etc.

For good level 4, answers should go beyond one country only i.e. "*North America"*

NB: An entirely generic account of the adv/disadv of renewable energy types unrelated to the North American context / Resources Booklet is likely to score L2 marks.

Synoptic linkages

Unit 3 Technological fix – energy technologies
Unit 1 climate change mitigation approaches
Unit 3 development / Unit 4 food security issues

Level	Mark	Descriptor
Level 1	1-4	A few general ideas on one or two renewable sources; descriptive. Structure is poor or absent. Explanations are over simplified and lack clarity. Geographical terminology is rarely used with accuracy. There are frequent grammar, punctuation and spelling errors.
Level 2	5-7	Covers a range of renewables in terms of +/- aspects but lacks link to energy security. Structure is satisfactory. Explanations are clear, but there are areas of less clarity. Geographical terminology is used with some accuracy. There are some grammar, punctuation and spelling errors.
Level 3	8-11	Coverage of a range of renewable sources with some assessment of contribution to energy security. Good use of resources. Structure is good. Some reference to wider links. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are rare.
Level 4	12-14	A genuine assessment of a range of renewables weighing up their contribution to energy security. May move into areas such as efficiency. Provides an overview. Carefully structured. Strong synoptic links. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are very rare.

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