N20/3/GEOGR/BP2/ENG/TZ0/XX/M

Diploma Programme
Programme du diplôme
Programa del Diploma

# Markscheme

## November 2020

## Geography

## Higher level and standard level

## Paper 2

13 pages

## Paper 2 Section C markbands

| Marks | Level descriptor | | |
|---|---|---|---|
| | **AO1: Knowledge and understanding of specified content**<br>**AO2: Application and analysis of knowledge and understanding** | **AO3: Synthesis and evaluation** | **AO4: Selection, use and application of a variety of appropriate skills and techniques** |
| 0 | The work does not reach a standard described by the descriptors below. | | |
| 1–2 | **The response is too brief, lists unconnected information, is not focused on the question and lacks structure.** | | |
| | • The response is very brief or descriptive, **listing** a series of unconnected comments or largely irrelevant information. The knowledge and understanding presented is very general with large gaps or errors in interpretation. Examples or case studies are not included or only **listed**.<br>• There is no evidence of analysis.<br>• Terminology is missing, not defined, irrelevant or used incorrectly. | • No evidence of evaluation or conclusion is expected at this level. | • Information presented is not grouped logically (in paragraphs or sections).<br>• Maps, graphs or diagrams are not included, are irrelevant or difficult to decipher (only if appropriate to the question). |
| 3–4 | **The response is too general, lacks detail, is not focused on the question and is largely unstructured.** | | |
| | • The response is very general. The knowledge and understanding presented **outlines** examples, statistics, and facts that are both relevant and irrelevant. Links to the question are **listed**.<br>• The argument or analysis presented is not relevant to the question.<br>• Basic terminology is defined and used but with errors in understanding or used inconsistently. | • If appropriate to the question, the conclusion is irrelevant.<br>• There is no evidence of critical evaluation of evidence (examples, statistics and case studies). | • Most of the information is not grouped logically (in paragraphs or sections).<br>• Maps, graphs or diagrams included lack detail, are incorrectly or only partially interpreted without explicit connections to the question (only if appropriate to the question). |
| 5–6 | **The response partially addresses the question, but with a narrow argument, an unsubstantiated conclusion, and limited evaluation.** | | |
| | • The response **describes** relevant supporting evidence (information, examples, case studies et cetera), **outlining** appropriate link(s) to the question.<br>• The argument or analysis partially addresses the question or elaborates one point repeatedly.<br>• Relevant terminology is defined and used with only minor errors in understanding or is used inconsistently. | • If appropriate to the question, the conclusions are general, not aligned with the evidence presented and/or based on an incorrect interpretation of the evidence.<br>• Other perspectives on evidence (examples, statistics and case studies) and/or strengths and weaknesses of evidence are **listed**. | • Logically related information is grouped together (in sections or paragraphs) but not consistently.<br>• Maps, graphs or diagrams included do not follow conventions, and include relevant and irrelevant interpretations in the text (only if appropriate to the question). |

<table>
<tr><td>7–8</td><td colspan="3">The response addresses the whole question, the analysis is evaluated and the conclusion is relevant but lacks balance.</td></tr>
<tr><td></td><td>• The response describes relevant supporting evidence correctly (information, examples and case studies) that covers all the main points of the question, describing appropriate links to the question.<br>• The argument or analysis is clear and relevant to the question but one-sided or unbalanced.<br>• Complex terminology is defined and used correctly but not consistently.</td><td>• If appropriate to the question, the conclusion is relevant to the question, aligned with the evidence but unbalanced.<br>• Other perspectives on evidence (examples, statistics and case studies) and/or strengths and weaknesses of evidence are described.</td><td>• Logically related information is grouped together (in sections) consistently.<br>• Maps, graphs or diagrams included contribute to/support the argument or analysis (only if appropriate to the question).</td></tr>
<tr><td>9–10</td><td colspan="3">The response is in-depth and question-specific (topic and command term); analysis and conclusion are justified through well-developed evaluation of evidence and perspectives.</td></tr>
<tr><td></td><td>• The response explains correct and relevant examples, statistics and details that are integrated in the response, explaining the appropriate link to the question.<br>• The argument or analysis is balanced, presenting evidence that is discussed, explaining complexity, exceptions and comparisons.<br>• Complex and relevant terminology is used correctly throughout the response.</td><td>• If appropriate to the question, the conclusion is relevant to the question, balanced and aligned with the evidence.<br>• Evaluation includes a systematic and detailed presentation of ideas, cause and effect relations, other perspectives; strengths and weaknesses of evidence are discussed; (if appropriate) includes justification of the argument and conclusion.</td><td>• Response is logically structured with discussion (and if appropriate to the question, a conclusion) focusing on the argument or points made, making it easy to follow.<br>• Maps, graphs or diagrams are annotated following conventions and their relevance is explained and support the argument or analysis (only if appropriate to the question).</td></tr>
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# Section A

## 1. Changing population

(a) Describe the projected trends for the two dependent population groups from 2020 to 2060. **[2]**

*Award **[1]** for each valid descriptive statement. Needs separate reference to both elderly **[1]** and children **[1]** for maximum marks.*

*Quantification is needed for **[2]**.*

Possibilities include:
- 65 and over - no change / the proportion increases (actual amount remains 34-36 million but the percentage of 65 and over increases)
- 0 –15 - drops (from 14-16 in 2020 to 7-9 in 2060) / the proportion of the total population decreases).

(b) Suggest **two** potential socio-economic problems that could result from the projected population trend. **[2+2]**

The trend can be falling population total / a greying population / decreasing number of children.

*Allow **[1]** for a valid problem and **[1]** for development or exemplification.*

Possibilities include:

- declining population and the resulting economic implications, such as a reduced work force, decreased tax revenue, shortage of qualified workers, declining productivity, high labour costs, a smaller tax base
- declining population and social implications, such as social consequences of immigration caused by shortage of workers
- increased dependency ratio/ageing population - increased expenditure to care for an ageing population due to pensions, health care
- decreasing number of children – may lead to closure of schools, unemployment in education sector

For example: An ageing population **[1]** would need more money to be spent on pensions **[1]**, which would take a larger proportion of a nation's GDP **[1]**. as seen in the UK **[1]**.

For example: A declining population **[1]** means that there will be a smaller workforce **[1]**, which may mean that people are made to stay in work for longer **[1]**. In recent years the retirement age in Canada has increased from 65 to 67 **[1]**.

(c) Explain **two** ways in which **one named** country benefits from a demographic dividend. **[2+2]**

*Allow **[1]** for a valid way and **[1]** for development or exemplification.*

Possibilities include:
- Increased proportion of the population in the independent age range – provides a larger work force, increase in economic growth, potentially a larger market, increase in tax returns

- Falling fertility rates – more women enter the workforce, boosting gender equity, lower proportion of children to support, frees up resources for investment in economic development/family welfare

- Attracts large amounts of foreign investment, the nation becomes more important on the global stage.

- Increase in savings rate – working age is the prime period for saving, working population saving for old age

- Potential reduction in poverty – higher proportion of population working, (higher proportion of middle-income earners)

For example: India has one of the youngest populations and this will give an increase in economic growth **[1]** due to an increase in the proportion of independent population that provides a workforce **[1]**.

*Award a maximum of **[3]** if no valid country is identified.*

## 2. Global climate – vulnerability and resilience

(a) (i) State the age at which the average US citizen produces the most $CO_2$ emissions. **[1]**

65 *(accept 64–66)*

(ii) State the age range in which the most rapid increase in $CO_2$ emissions occurs. **[1]**

13–23 *(accept answers between 12-14 and 22-24)*

(b) Suggest **two** health hazards that may result from climate change. **[2+2]**

*In each case, award **[1]** for identification of a valid health hazard, with a further **[1]** for development.*

Possibilities include:

- Health hazards associated with extreme heat – cardiovascular and respiratory diseases.
- Health hazards associated with drought – gastroenteritis, salmonella, typhoid.
- Health hazards associated with floods – cholera, malaria, drowning.
- Health hazards associated with extreme weather such as hurricanes – injury, asphyxiation in a landslide
- Health hazards associated with changing (distribution of) climates – northward movement of tropical insects, increase in disease carrying organisms - mosquitoes.
- Health hazards that result from changes in agricultural production – undernourishment, leading to diseases such as marasmus and diarrhea.
- Mental health issues that are linked to climate change - anxiety, depression and post-traumatic stress disorder linked to extreme weather-related natural disasters, decline in farm outputs can lead to stress
- Melting permafrost may release viruses stored in the soil – anthrax in Siberia in 2016.

For example: Climate change is expected to cause an expansion of the geographic range and seasonality of ticks **[1]**, which has led to an increase in Lyme disease and other tick-borne diseases in parts of North America and Europe **[1]**.

(c) Explain how **two** methods of geo-engineering could mitigate climate change. **[2+2]**

*In each case, award **[1]** for identification of a valid method of the deliberate **large-scale manipulation** of an environmental process that affects the Earth's climate, with a further **[1]** for explanation.*

Possibilities include:

- Large-scale afforestation – removes atmospheric $CO_2$.
- Carbon dioxide removal by artificial trees.
- Ocean fertilization – adding nutrients to oceans to encourage growth of $CO_2$-eating plankton.
- Reflective aerosols - inject particles of Sulphur into the atmosphere – act as aerosols and reflect sunlight.
- Space mirrors – these reflect solar radiation so that it does not reach the Earth's surface.
- Cloud seeding
- Albedo modification - increase number of reflective surfaces such as roads, roofs – enhances albedo. High albedo crops, micro-bubbling – releasing air bubbles into ocean surface to increase albedo, vertical gardens/green buildings at scale above local

For example: $CO_2$ removal from the atmosphere by carbon filtering **[1]**. Captured carbon is then stored in rocks **[1]**.

**3. Global resource consumption and security**

(a) Describe what is meant by an individual's ecological footprint. **[2]**

The approximate area of land and water needed to provide a person with the resources needed to live **[1]** and to absorb their waste **[1]**.

(b) Suggest **two** ways in which meeting a nation's water needs could result in reduced food availability. **[2+2]**

*In each case, award **[1]** for a valid way a nation's water needs are met and **[1]** for its impact on reducing food availability.*

Possibilities of valid ways include:
- over extraction of groundwater for crop production (food or non-food)/industry/urban demands
- reservoirs built to provide water for urban areas/cash crop production, reservoirs built in one country use water that another country needs for agriculture
- one country's water imports leave another country with less water, imports of water cost money – less to invest in agriculture
- water used by tourism.

Possibilities of reduction of food availability include:
- decreasing the supply of water to agricultural areas/farms
- taking over agricultural land
- impacts upon the quality of water used in agriculture

For example: Over-extraction for cash crops **[1]** leads to insufficient water left to grow food crops **[1]**.

(c) Explain how a circular economy approach can contribute to:

(i) reduced use of new resources; **[2]**

*Award **[1]** for a valid way of reducing new resources and **[1]** for development.*

Possibilities include:
- recycling of materials means that less raw material is required, reference to inputs and outputs using systems approach
- reuse/refurbishment of goods decreases the demand for new goods and therefore raw materials
- industrial symbiosis – turning one industry's by-product into another's raw materials
- design/consume products that are built to last/durable
- resource efficiency by reducing the quantity of materials needed to produce a good – rraw materials/energy/water – asset sharing, reduced storage of perishable material, use of technology
- incentivizing use of recycled/reused materials – taxes on products that use only virgin raw materials eg plastic packaging

For example: Products are produced in such a way that they have a "life after death" **[1]**, as parts will have further use later **[1],** decreases need for raw materials.

(ii) changing attitudes to product ownership. **[2]**

*Award **[1]** for a valid change and **[1]** for development.*

Possibilities include:

- changes in consumer behaviour – fast fashion, food waste, single use plastic bags
- consume less – owning fewer consumer goods means less production is required
- accepting the purchase of pre-owned goods – using pre-owned clothes cuts down on raw materials/energy needed for clothes
- purchase of goods that are built to last – prolongs the life of goods so renewal is reduced
- consumption of goods that are produced in more sustainable ways
- product renting/lease/pooling – avoid purchasing for individuals altogether – shift to sharing platforms – decrease in consumption of CDs and DVDs and use of online entertainment.

For example: People rent goods as opposed to buying them **[1],** which means that they are less likely to be "designed for the dump" **[1]**.

## Section B

**4.** (a) Describe trends in the proportion of fuel directly imported into Australia between 2000 and 2013. **[2]**

*Award **[1]** for each trend. Two trends required for **[2]**. Quantification needed for **[2]**.*

- Increasing overall.
- Slow increase between 2000 and 2004.
- More rapid increase between 2007 and 2013.
- Fluctuating.

(b) Suggest **one** graphical method that could depict the information in box A, giving a reason for your choice. **[2]**

*Award **[1]** for a valid suggestion and **[1]** for reason for choice.*

Possibilities include:
- Bar graph – easily constructed/analysed, contains categorized data.
- Proportional shapes – easy visual analysis.
- Pie charts – easy to identify relative proportions.

(c) To what extent might this infographic make Australian citizens more concerned about their energy security than they need to be? **[6]**

*Award **[1]** mark for each relevant point and **[1]** for each supported development/explanation, up to a maximum of **[5]**. Award the final **[1]** for an overall appraisal that weighs up the infographic as a whole.*

*Award a maximum of **[4]** if only one perspective is given.*

Relevant points include:

More concerned:
- Fuel supply could run out in weeks
- Conflict in the Middle East and impacts on financial stability – costs of fuel increase.
- Piracy and impacts on shipping lanes.
- Reliance on Singapore.
- Increasing reliance on imports of fuel.
- Closure of refineries decreases ability to process raw fuels.
- Infographic does not emphasize renewable energy possibilities.
- Negative language – dramatic nature of the title, boxes introduced as risks
- Infographic supplied by a reliable source

Not concerned:
- Australia has abundant renewable and non-renewable energy resources
- Australia is the world's 9$^{th}$ largest energy producer
- Many of the risks are predictions rather than actual issues
- Introduction of non-oil based alternative fuels, electric cars

Appraisal – accept any valid appraisal linked to supporting materials from the infographic
- Overall tone is pessimistic rather than optimistic.
- Infographic gives feeling of vulnerability
- Infographic provides a series of possible solutions.

## Section C

**5.** "The growth of the global middle class will inevitably accelerate climate change." To what extent do you agree with this statement? **[10]**

*Marks should be allocated according to the markbands on pages 3–4.*

Possible **applied themes** (AO2) demonstrating **knowledge and understanding** (AO1):

- Reponses could show some understanding of the main anthropogenic causes of climate change. The enhanced greenhouse effect should be explored, with a focus on an increase in GHGs is the atmosphere – such as $CO_2$, $CH_4$. Sources of these emissions vary over time and space but there is a definite link between a region's/individual's emissions and their level of socio-economic development. *Per capita* global emissions are much higher in high-income regions, as they are linked to development, trade and globalization.
- As low- to middle-income countries develop over time, there is an increase in the standard of living of many millions of their inhabitants. This emerging middle class, given the present model of development, will increase their ecological footprint as consumption and waste generation increases. For example, as disposable income has increased in China over the past 30 years, diets have changed to include more meat. Animal agriculture is a major contributor of greenhouse gasses like methane, and many carbon sinks – such as rainforests – are being cleared to accommodate more grazing land or land for growing cattle feed.
- As this global middle class grows, so does their consumption of fossil fuels, as there is an increase in electricity consumption and car ownership and a demand for foreign goods, which increases global trade – all activities which rely on the use of traditional fossil fuels in many nations.
- It could be noted that the *per capita* emissions of individuals in high-income nations are still much higher and have been so for a long time.
- Alternatively, responses may disagree with the statement and argue that, as a new middle class grows, there are opportunities to learn from the mistakes of the past and to develop using greener technologies, thus keeping ecological footprints to more sustainable levels than those of the "Economic North".
- Responses could argue that it is already too late and that we have reached a tipping point where feedback loops are already at play, causing irreversible climate change.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) that focuses on the relative role of the growing middle class on speeding up climate change. Responses may address the spatial aspect of middle-class growth and the varying impacts upon climate change.

**For 5–6 marks**
Expect a weakly evidenced outlining of some links between rising wealth and climate change / carbon emissions.

**For 7–8 marks**
Expect a well-structured account which includes:

- either a well-evidenced synthesis that links together several themes from the Guide and acknowledges both sides of the argument
- or a critical conclusion (or ongoing evaluation) informed by geographical concepts and/or perspectives.

**For 9–10 marks**
Expect both traits.

**6.** "Resource insecurity is becoming the main cause of forced migration." To what extent do you agree with this statement? **[10]**

*Marks should be allocated according to the markbands on pages 3–4*.

Possible **applied themes** (AO2) demonstrating **knowledge and understanding** (AO1):

- Resource insecurity that could result in forced migration could be related to food – famine; water – or drought/contamination/disease. For example, Somalis moving to Kenya as a result of ongoing drought and famine.
- Population growth many be seen as the underlying cause of resource insecurity, especially in Sub-Saharan Africa.
- Alternatively there are many other causes of forced migration, both political (war/minority persecution), social (intolerance *eg*, LGBTQI+/crime/religion), economic (lack of employment opportunities) and environmental (sea level changes).
- Many of the factors listed above do not work in isolation and have close causal links – many wars are the result of access to resources *eg*, Somalia, Sudan.
- Responses may argue that the underlying cause of all significant forced migrations is climate change, which increases the likelihood of resource insecurity.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) that focuses on the changing role of resource insecurity as a catalyst of forced migrations over time. Responses may address the spatial aspect of forced migration and the role of resource insecurity in different parts of the world.

**For 5–6 marks**
Expect a weakly evidenced outlining of resource insecurity as a cause of forced migration

**For 7–8 marks**
Expect a well-structured account which includes:

- either a well-evidenced synthesis that links together several themes from the guide and acknowledges both sides of the argument
- or a critical conclusion (or ongoing evaluation) informed by geographical concepts and/or perspectives.

**For 9–10 marks**
Expect both traits.