Neap

Trial Examination 2021

VCE Geography Units 3&4

Written Examination

Suggested Solutions

Question 1 (12 marks)

a. *For example:*

The suburb of Officer is located in southeast Victoria, 54 km from the CBD along the M1 freeway. 1 mark

Officer is located in the Cardinia Shire and is surrounded by other suburbs such as Berwick and Pakenham. 1 mark

Note: Responses may refer to temporal or spatial distance from the central business district (CBD) or other key landmark; temporal or spatial distance from other towns in the region; surrounding towns or suburbs; or local government area (LGA) or region.

b. *For example, any one of the following natural geographical characteristics:*

- natural land cover
- natural plant or animal life
- climate or weather
- coastal or landscape features
- topography

For example, any one of the following human geographical characteristics:

- construction
- urbanisation
- transport routes or connections
- infrastructure/industry

Sample response (Officer):

Natural geographical characteristic: native remnant bushland located along the Cardinia Aqueduct Trail 1 mark

Human geographical characteristic: high-density housing estates being developed throughout the suburb 1 mark

c. *For example (Officer):*

Officer has recently undergone significant land use changes through the urbanisation of agricultural and industrial land into high-density housing estates.

In 1870, Officer was an industrial region known for its timber production and transport. In later years, it was known for brickmaking. By 2014, expansion of the urban growth corridor meant that Officer's agricultural land became highly sought after. Officer's population increased from 1761 in 2011 to 7133 in 2016, and estimates predict that a further 30 000 people will move to the suburb in the next 10 years. Continued demand for affordable housing over the last three years has resulted in a 22.65% growth in median house prices. To support the change of land use from agricultural to urban living, government funding has been invested in updating the local train station and improving major road arterials and the M1 freeway.

4 marks

1 mark for identifying or classifying the land change that occurred.
1 mark for referencing dates or times where appropriate in sequential order.
1 mark for referencing key events or changes in the area linked to student's study.
1 mark for using data and/or examples throughout as evidence.

d. *For example (Officer):*

The Cardinia Shire Council had significant influence on the process of land use change in Officer. In their 2020 council plan, the council states it will 'carefully plan and manage' (2020, p. 4) growth of the region. The council must approve all building permits and estate plans, and release of newly titled land may be restricted until council approval is granted. The council is also responsible for the construction of some roads and property buyback for construction. In February 2016, plans and designs for the Officer Town Centre were released to the public to view what the council has planned for future development of urban centres and amenities to service the growing population.

4 marks

1 mark for identifying a relevant stakeholder (individual, group or organisation).
1 mark for stating their influence in the land use change.
1 mark for providing a clear link between the stakeholders and the land use change process.
1 mark for using examples or data as evidence.
Note: Responses will vary depending on selected area of fieldwork and geographical characteristics and processes. It should be clear through the response that the student has visited or virtually engaged with the site and completed investigations about land use change in the region. High-scoring responses will include clear examples and statistical data. Responses that identify or describe more than one stakeholder should not be awarded additional marks.

Question 2 (8 marks)

For example:

Desertification is occurring in Niger, Africa.

More than 50% of Niger is vulnerable to desertification. Overfarming of land is a cause of desertification in Niger. Due to Niger's rapid population growth rate of 3.8% (in 2019), traditional nomadic farming has been replaced with intensive localised crop and livestock agriculture. In 2015, expansion of croplands contributed to around 57% of Niger's total land cover change. Unsustainable farming practices such as overgrazing and overcropping have caused a reduction in vegetative cover and increased land degradation rates. Loss of productivity as a result of overfarming could have further negative effects on the country, with Niger now facing severe food insecurity and over 20% of the population needing urgent food support.

Deforestation is another cause of desertification in Niger. The roots of vegetation help provide structure to the soil and reduce topsoil erosion from the seasonal rains and windstorms. Leaf litter also contributes to the natural composting system, returning nutrients to the soil and ensuring continued microbial growth. Since 2000, Niger has lost 55% of its natural forest cover. As a result, widespread land clearing and removal of naturally occurring vegetation meant that the land was exposed to excessive run-off, erosion and mineral depletion. As it can take up to 400 years to produce 1 cm of fertile topsoil, by removing vegetation to make way for food crops, farmers are at risk of reduced productivity rates.

8 marks

1 mark for each cause of desertification in the country identified (two required).
1 mark for using examples or evidence for each cause.
1 mark for providing a clear link between each cause and the impacts of desertification.
1 mark for using examples or evidence of the impacts of desertification for each cause.
Note: High-scoring responses will provide examples or evidence of causes and impacts specific to the country identified. While generalised responses such as reduced productivity or erosion are correct, there should be clear elaboration on these statements for the country identified. Two causes are prescribed; additional marks should not be awarded for responses that provide more than two causes.

Question 3 (10 marks)

a. *For example, any one of:*

- climate change
- changes in greenhouse gas concentrations or carbon cycles
- rapid rise in sea-level
- changes in precipitation rates

Sample response (climate change):

Climate change has led to an increase in vegetation distribution on a global scale between the Last Glacial Maximum (LGM) around 20 000 years ago and present day. The Earth's climate naturally fluctuates over time, moving between periods of ice ages and warm periods. The LGM was characterised as a cool and dry period where glaciers covered over 8% of the Earth's surface and sea levels were estimated to be over 120 metres lower than present day. Due to the colder global climate and shifting weather patterns, studies have suggested that global mean precipitation levels were also 11.8% lower than present day levels. A cool climate and lower, more unpredictable precipitation rates meant that steppe-like grasslands and taiga dominated vegetative land cover along the equator and tundra towards the poles. As the Earth warmed during the Holocene Climatic Optimum 8000 years ago, a more tropical climate and increased rainfall resulted in glacial melt and the formation of large lakes and rivers, allowing for expansion of vegetation distribution. Today, while grasslands and tundra are still widely distributed throughout the temperate and polar latitudes, tropical conditions, especially along the equator, have meant that forests now cover 31% of land surface.

6 marks

1 mark for clearly identifying one natural process and the change that occurred.
1 mark for elaborating on the process and interconnection with temporal scale.
2 marks for using examples and showing a clear understanding of the link between the process and vegetation distribution during the LGM.
2 marks for elaborating on the change that occurred over time as a result of the process.

b. *For example, any one of:*

- satellite imagery
- Global Positioning System (GPS)/Global Navigation Satellite System (GNSS)
- remote sensing
- drones and scanners
- Geographic Information Systems (GIS) mapping

Sample response (assessing change using satellite imagery):

An example of a spatial technology is satellite imagery, which allows geographers to monitor land cover change over time. For example, the *World Atlas of Desertification* uses satellite imagery over decades to calculate changes in aridity, primary productivity and human land use activities on a global scale. This technology allows authorities to assess changes over time and provides evidence of the impact that soil loss and degradation may have on people and places. Assessing and monitoring land cover change using satellite imagery and analysing this data along with climate and population predictions will be vital for countries such as India and China, as well as dryland regions such as Sub-Saharan Africa, which are predicted to see an almost 50% reduction in crop production by 2050 as a result of land degradation.

Sample response (managing change using satellite imagery):

An example of a spatial technology is satellite imagery. Satellite imagery can be useful in managing land cover change as it enables researchers to target funding and efforts to specific regions. For example, DesertWatch is a desertification monitoring service that is being used by a range of European countries to first assess the location and damage caused by desertification and then calculate risk and create recovery maps. This allows authorities to manage and regenerate landscapes that are vital for agricultural productivity and vulnerable to fires. DesertWatch has also been used to forecast regions susceptible to desertification as a result of overuse or overcultivation, and to detect pressure on vegetation and significant environmental changes.

4 marks

1 mark for identifying a form of spatial technology.
1 mark for identifying how the technology is used to assess or manage change.
2 marks for using examples of or providing elaborations on the technology's use.
Note: Responses should reference a chosen form of spatial technology and clearly show how it is useful in assessing or managing change. Additional marks should not be awarded for responses that address both the assessment and management of land cover change.

Question 4 (10 marks)

For example:

Deforestation is occurring in Borneo, Indonesia.

Borneo is experiencing deforestation rates of over 1.3 million hectares per year largely due to the plantation of oil palms. Deforestation is having widespread impacts on local biodiversity and environmental sustainability. From 2001–2020, Global Forest Watch calculated that a 17% reduction in tree cover has resulted in over 19.0 Gt of carbon emissions in Indonesia alone. In response to the rapid deforestation rates, in 2011 the Indonesian government introduced a temporary moratorium on forest clearing. Initially, the moratorium was proposed for a period of two years but has since been extended several times. The moratorium aimed to reduce forest clearing in Borneo by limiting the number of new industrial concessions and support the government's goal to reduce carbon emissions by 26% by 2020. In 2016, a moratorium was also placed on the conversion of 11.5 million hectares of peatlands as a result of the disastrous fire and smog events in 2015.

Studies have found that the moratorium has had a small, positive impact on forest sustainability in Borneo. It protected an additional 380 000 hectares of forests not already protected by law. Studies have also shown that the annual deforestation rate slowed in Indonesia to less than half a million hectares annually in the first three years of the moratorium. However, much criticism has surrounded the fact that the moratorium only applies to primary natural forests, so offered no protection for secondary forests and already degraded areas. Further, exceptions for new concessions are made for projects related to 'national development' (cited in Mongabay 2015). Suggestions have been raised that the moratorium should be broadened to include a review of all concessions to protect both primary and secondary forests in Borneo in order to realistically meet emissions targets. As a result, overall the moratorium has not been effective in reducing the large-scale impacts of deforestation in Borneo.

10 marks

1 mark for providing a clear explanation of the impacts of deforestation or desertification in the selected location.
2 marks for describing one national response to the impacts of deforestation or desertification.
2 marks for using data, dates and examples where appropriate to elaborate on the link between the response and the impacts of deforestation or desertification.
2 marks for evaluating one criterion for response effectiveness using evidence.
2 marks for evaluating a second criterion for response effectiveness using evidence.
1 mark for clearly evaluating the effectiveness of the response.
Note: High-scoring responses will provide specific examples of impacts occurring in the selected location and clearly link these with the national response. While a range of criteria are acceptable to evaluate the effectiveness of the national response, high-scoring responses will provide an evidence-driven analysis that shows how the impacts in the selected location are being addressed.

Question 5 (10 marks)

a. *For example:*

Overall, life expectancy increased across all world regions from 1950 to 2019. For example, life expectancy in Asia improved from around 20–55 years in 1950 to 60–85 years in 2019. Life expectancy in North America improved from 30–70 years in 1950 to 65–over 85 years in 2019. However, world regional populations did not increase in life expectancy at the same rate. For example, while life expectancy in some European countries has increased from around 60–70 years in 1950 to 70–over 85 years in 2019, life expectancy in Africa has almost doubled. In 1950, Mali's life expectancy was 20–30 years but in 2019 was up to 60 years. Similarly, in 1950, Algeria's life expectancy was less than 45 years and in 2019 this improved to over 75 years.

5 marks

1 mark for stating a generalised or 'big picture' pattern that links directly with key question terms (for example, 1950 to 2019, world regional context).
2 marks for addressing and quantifying at least two key world regions as examples of the pattern.
2 marks for addressing and quantifying at least one exception or nuance to the pattern.
Note: Responses may vary based on the pattern identified, exceptions explored and data associated with the pattern.

b. *For example, any two of:*

- improved technology
- improved medical services, access to services and more affordable healthcare
- spatial association between income and improved life expectancy
- improved food security and access to clean water and sanitation
- improved access to education and women's rights

Sample response (improved technology; and improved medical services, access to services and more affordable healthcare):

Technological advancements have allowed for improved living conditions across all world regions, especially those in less economically developed countries. 1 mark

Further, improved access and affordability of medical services and healthcare has meant that fewer people are vulnerable to dying at a young age from diseases and illnesses such as malaria or HIV/AIDS. 1 mark

As a result, life expectancy is improving on a global scale. 1 mark

c. It is predicted that life expectancy will continue to improve into the future, especially in less economically developed nations where better access to education, medical services and resource infrastructure will decrease the premature mortality rate. 1 mark 1 mark

Question 6 (6 marks)

For example:

The Demographic Transition Model (DTM) uses generalised birth and death rate patterns to illustrate how a country's population growth rate moves through developmental stages. As a country moves through the model's stages, the total population increases, while birth and death rates decrease. The DTM allows geographers to assess particular social and economic factors that influence population dynamics and classify countries according to their population characteristics. It is useful for highlighting some of the key differences between less economically developed nations and more economically developed nations by indicating improved healthcare, sanitation, contraception, increased equality and employment opportunities to access wealth. However, the DTM does not take into account the impact of migration on population growth and characteristics. In an increasingly globalised world, migration now plays a bigger role than ever in determining population characteristics. Populations may grow as a result of migration, while birth and death rates may remain constant. Migration rates may also impact the distribution of resources and availability of jobs, housing and medical supplies, which could ultimately impact a country's position on the DTM.

6 marks

2 marks for showing an understanding of the DTM through a description of its characteristics.

1 mark for outlining the general usefulness of the DTM for understanding population dynamics.

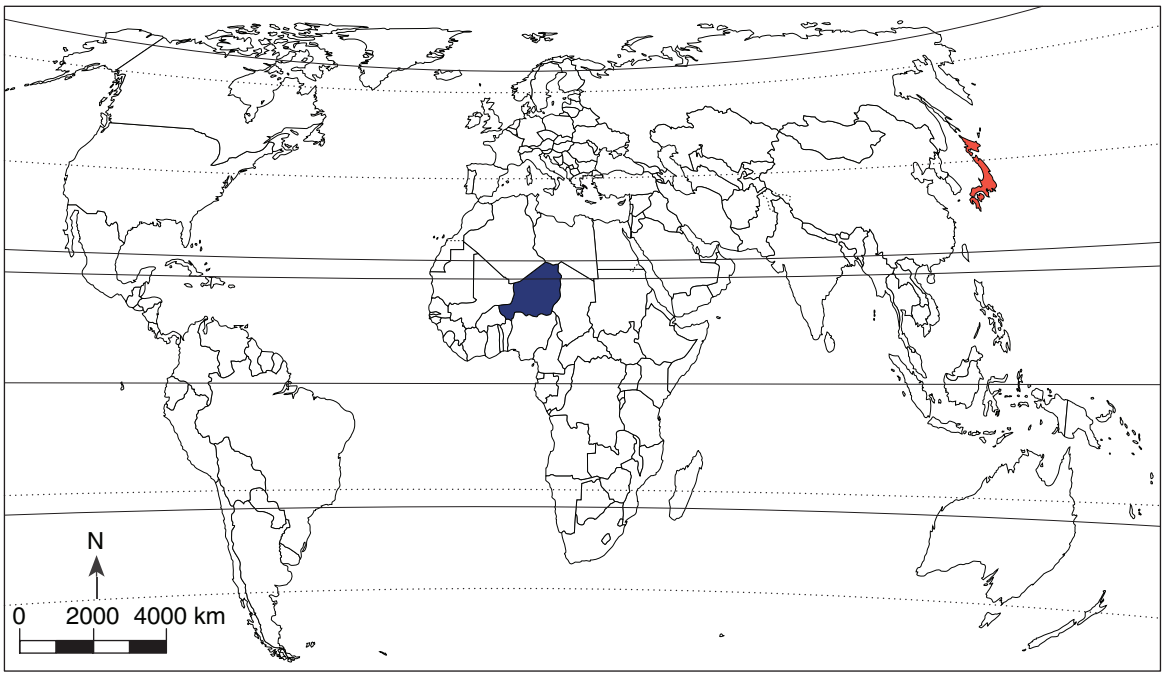
1 mark for identifying one limitation of the DTM for understanding population dynamics.

2 marks for elaborating on the limitation.

Question 7 (16 marks)

a. *For example:*

Location of a country with an ageing population and a country with a growing population



Key
- Niger, a growing population
- Japan, an ageing population

Source: Adapted from d-maps.com (n.d.). *Planisphere World (Europe Africa)* [map], d-maps.com website. Accessed May 2021. https://d-maps.com/carte.php?num_car=13183&lang=en.

4 marks

1 mark for accurately marking and naming a country that has an ageing population.
1 mark for accurately marking and naming a country that has a growing population.
1 mark for using correct conventions to complete the map, including border, informative title, and use of pencil and colour/symbols.
1 mark for providing a clear and logical legend/key that includes the two chosen countries.

b. *Sample response (Japan and Niger):*

Japan is currently situated in stage 5 of the DTM. Due to its fertility rate of around 1.4 births per woman being lower than its replacement rate, Japan's population growth rate in 2019 was around –0.2%. This decline is significant as it has implications for Japan's future workforce and economy and tax burdens for young people. Issues such as increased pressure on healthcare systems will create challenges for young carers as lowering death rates mean that of the 127 million Japanese citizens, over 80 000 are living to at least the age of 100, requiring increased care, medical assistance and resources.

Niger has a current fertility rate of 6.8 births per woman and as a result experienced a population growth rate of around 3.8% in 2019. A high infant mortality rate of around 43.5 deaths per 1000 live births in 2020 are correlated with high birth rates. Rapid population growth is increasing pressure on resources and food production with over 20% of the population needing urgent support due to food insecurity. It is estimated that with global warming, ongoing droughts and unsustainable farming practices leading to increased rates of desertification, food insecurity and poverty rates will continue to increase.

6 marks

*1 mark for clearly stating at least one issue faced by the ageing population mapped in **part a.***

2 marks for explaining why the issue is significant in the specific population and elaborating using data or examples.

*1 mark for clearly stating at least one issue faced by the growing population mapped in **part a.***

2 marks for explaining why the issue is significant in the specific population and elaborating using data or examples.

*Note: Responses should clearly identify population issues faced by both the ageing and growing countries mapped in **part a.** There should be a clear distinction between the issues and challenges these countries face. High-scoring responses will provide clear data and elaboration specific to the focal countries and avoid generalisations.*

c. *Sample response (economic conditions of Japan and Niger):*

Japan and Niger face different population issues due in part to their population growth rates. In both countries, economic conditions worsen the impacts of these patterns. In Niger, extreme poverty rates of over 42.9% in 2020 and lack of suitable living conditions contributes to a high mortality rate (46.7 deaths per 1000 people in 2019) compared to Japan (10.7 deaths per 1000 people in 2019). Niger's high mortality rate in part encourages larger family sizes and puts further pressure on Niger's economy to provide assistance, resources and medical care to communities. In contrast, Japan's declining population (–0.2% population growth rate in 2019) and low mortality rate mean that there is increased economic pressure on young people to support the elderly through taxes and increased retirement ages. High standards of living are expected and as workforce numbers are estimated to decline by 20% by 2040, economic conditions will mean that these issues are exacerbated.

6 marks

1 mark for providing a clear link to economic or social conditions.

2 marks for identifying at least two key differences between the issues faced by the mapped countries' populations.

3 marks for using examples and data to elaborate on the key differences.

Note: Responses must only address either economic or social conditions. Additional marks should not be awarded for responses that address both economic and social conditions.

Question 8 (8 marks)

For example:

A strategy implemented by the Japanese government in response to Japan's ageing population is increasing the number of immigrant workers allowed in Japan. In 2018, the Abe administration signed legislation that aimed to increase Japan's labour force using two main visa types. The first visa allowed independent unskilled workers to stay in Japan for a maximum of five years, while the second allowed skilled workers to bring their families to Japan and apply for citizenship after five years. This built upon the existing policy allowing people to stay as 'temporary workers' (Milly 2020).

Spatial technology such as geographic information system (GIS) mapping could assist the Japanese government in implementing this strategy by allowing them to track the immigration and emigration of foreign workers. GIS mapping could also be used to collect spatial data on the origins of foreign workers and the duration of their stay. Further, GIS mapping could be used to identify key regions of population decline that need to be targeted to improve workforce capabilities. Over time, data could be used to observe whether the policy has been successful or whether more needs to be done to increase the stability of Japan's future economy.

8 marks

1 mark for stating the ageing population studied.
1 mark for stating the strategy developed in response to the ageing population.
2 marks for describing the strategy using dates and data where appropriate.
1 mark for outlining the suggested form/s of spatial technology suitable for the development or implementation of the strategy.
1 mark for suggesting the use of spatial technology for the development or implementation of the strategy.
2 marks for making clear links between the use of spatial technology and the development or implementation of the strategy.

REFERENCES

Cardinia Shire Council (2020) *Creating the Future: Council Plan 2020* [PDF], Cardinia Shire Council, Officer, accessed 20 May 2021. https://www.cardinia.vic.gov.au/download/downloads/id/3145/council_plan_2020.pdf

Milly, DJ (20 February 2020) 'Japan's Labor Migration Reforms: Breaking with the Past?', *Migration Information Source*, accessed 12 June 2021. https://www.migrationpolicy.org/article/japan-labor-migration-reforms-breaking-past

Mongabay (25 April 2015) 'Jokowi must strengthen Indonesia's forest moratorium, not just extend it: activists', *Mongabay*, accessed 12 June 2021. https://news.mongabay.com/2015/04/jokowi-must-strengthen-indonesias-forest-moratorium-not-just-extend-it-activists/

