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# Geography

## Higher level

### Paper 1

4 May 2023

**Zone A** morning | **Zone B** afternoon | **Zone C** morning

2 hours 15 minutes

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#### Instructions to candidates

- Do not open this examination paper until instructed to do so.
- Answer the questions in three options.
- The accompanying **geography resource booklet** is required for this examination paper.
- The maximum mark for this examination paper is **[60 marks]**.

Option	Questions
Option A — Freshwater	1 – 2
Option B — Oceans and coastal margins	3 – 4
Option C — Extreme environments	5 – 6
Option D — Geophysical hazards	7 – 8
Option E — Leisure, tourism and sport	9 – 10
Option F — Food and health	11 – 12
Option G — Urban environments	13 – 14

Answer the questions in **three** options.

When relevant, answers should refer to case studies or examples, and where appropriate include well-drawn maps or diagrams.

**Option A — Freshwater**

Answer the following question.

1. Refer to the map on page 2 of the accompanying resource booklet.

The map shows the major wetland areas within the Murray–Darling river basin in the state of New South Wales in Australia.

- (a) (i) State the direction of flow of the Darling River. [1]  
(ii) Estimate the length of the wetland area, in kilometres, between **A** and **B**. [1]  
(b) Outline **one** benefit of maintaining a wetland area. [2]  
(c) Explain **one** pressure on wetlands from agriculture **and one** pressure on wetlands from altered water flow. [3 + 3]

Answer either part (a) or part (b).

**Either**

2. (a) Examine the view that it is increasingly difficult to predict river flooding. [10]

**Or**

2. (b) Examine why water management issues might be a cause of conflict between stakeholders. [10]

**End of Option A**

**Option B — Oceans and coastal margins**

Answer the following question.

3. Refer to the photograph on page 3 of the accompanying resource booklet.

The photograph shows the landscape at Cape Foulwind, South Island, New Zealand.

- (a) Using the photograph, identify **two** different coastal landforms formed by marine erosion. [1 + 1]
- (b) Outline **one** subaerial process that contributes to the erosion of coastal landforms. [2]
- (c) Explain how changes in sea level contribute to the formation of:
- (i) a raised beach; [3]
- (ii) a fjord. [3]

Answer either part (a) or part (b).

**Either**

4. (a) Examine how the increasing demand for abiotic resources in ocean areas may be a source of international conflict. [10]

**Or**

4. (b) Examine why it is difficult to reduce the impacts of hurricanes on coastal places and people. [10]

**End of Option B**

**Turn over**

**Option C — Extreme environments**

Answer the following question.

5. The table shows the vulnerability to desertification of selected countries in Asia.

Country	Total land area (km <sup>2</sup> )	Vulnerability to desertification		
		Flat area (km <sup>2</sup> )	Hilly area (km <sup>2</sup> )	Mountainous area (km <sup>2</sup> )
China	9 326 410	262 410	65 638	72 214
India	2 973 190	1 277 328	206 317	165 912
Indonesia	1 826 440	29 596	5 289	232
Pakistan	778 720	31 472	17 032	181 503
Myanmar	657 740	130 903	20 630	13 477
Thailand	511 770	90 241	7 265	0
Philippines	298 170	25 962	3 855	0
Laos	230 800	48 963	0	0
Nepal	136 800	20 131	0	228
Bhutan	47 000	1 407	0	0

[Source; Hossain, A. et al., Agricultural Land Degradation: Processes and Problems Undermining Future Food Security, In: Fahad, S., et al. *Environment, Climate, Plant and Vegetation Growth*, pp. 17–61, 2020, Springer Nature. [https://link.springer.com/chapter/10.1007/978-3-030-49732-3\\_2](https://link.springer.com/chapter/10.1007/978-3-030-49732-3_2).]

- (a) (i) Identify the country that has the most mountainous area vulnerable to desertification. [1]
- (ii) Estimate the percentage of land area in the Philippines vulnerable to desertification. [1]
- (b) Outline **one** way in which technology can increase access to water in arid environments. [2]
- (c) Explain how the process of desertification can be increased by:
  - (i) overgrazing; [3]
  - (ii) conflict. [3]

**(Option C continues on the following page)**

**(Option C continued)**

Answer either part (a) or part (b).

**Either**

6. (a) Examine the importance of glacial erosion in creating unique landscapes in glaciated upland areas. [10]

**Or**

6. (b) Examine how competition for resources in **one or more** extreme environments has led to conflict between different stakeholders. [10]

**End of Option C**

**Turn over**

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### Option D — Geophysical hazards

Answer the following question.

7. Refer to the map on page 4 of the accompanying resource booklet.

The map shows the thickness of the lava flows on the lower slopes from Kīlauea, a shield volcano, following its eruption in 2018.

- (a) (i) State the lava thickness that covers the largest area. [1]
- (ii) State the line of longitude nearest to the lava flow. [1]
- (b) Outline **one** reason why the lava from a shield volcano spreads over a wide area. [2]
- (c) Explain how **two** different communications technologies can help with the post-event management of geophysical hazards. [3 + 3]

Answer either part (a) or part (b).

#### Either

8. (a) Examine the importance of physical **and** human factors in increasing mass movement events. [10]

#### Or

8. (b) Examine how economic **and** social factors may reduce the vulnerability of communities to geophysical hazard risk. [10]

**End of Option D**

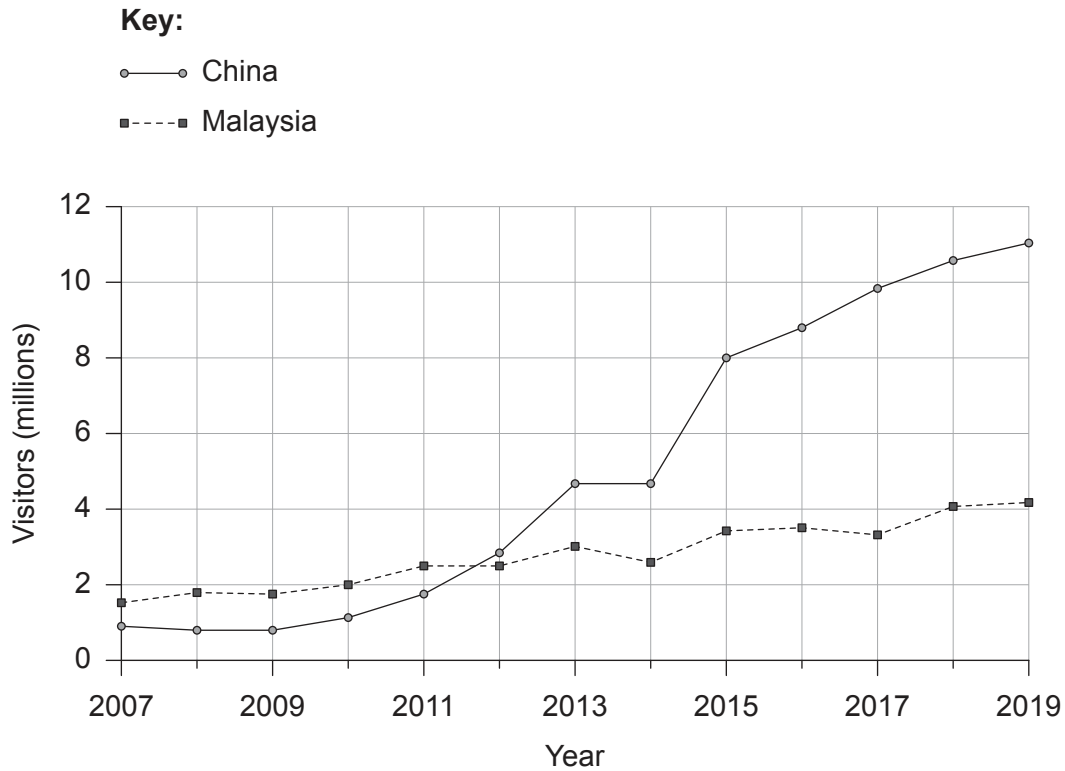
**Turn over**



**Option E — Leisure, tourism and sport**

Answer the following question.

9. The graph shows visitor arrivals to Thailand from China and Malaysia between 2007 and 2019.



- (a) (i) State the increase in visitors from Malaysia, in millions, between 2010 and 2018. [1]
- (ii) State the years between which the number of visitors from China increased the most. [1]
- (b) Outline **one** reason why the growth of diaspora can encourage tourists to a region. [2]
- (c) Explain the effects over time on visitor numbers caused by:
  - (i) social media; [3]
  - (ii) carrying capacity being exceeded. [3]

**(Option E continues on the following page)**

**(Option E continued)**

Answer either part (a) or part (b).

**Either**

10. (a) Examine the long-term benefits **and** costs to a country hosting an international sporting event. [10]

**Or**

10. (b) Examine reasons for variations in the spheres of influence for different kinds of leisure facility. [10]

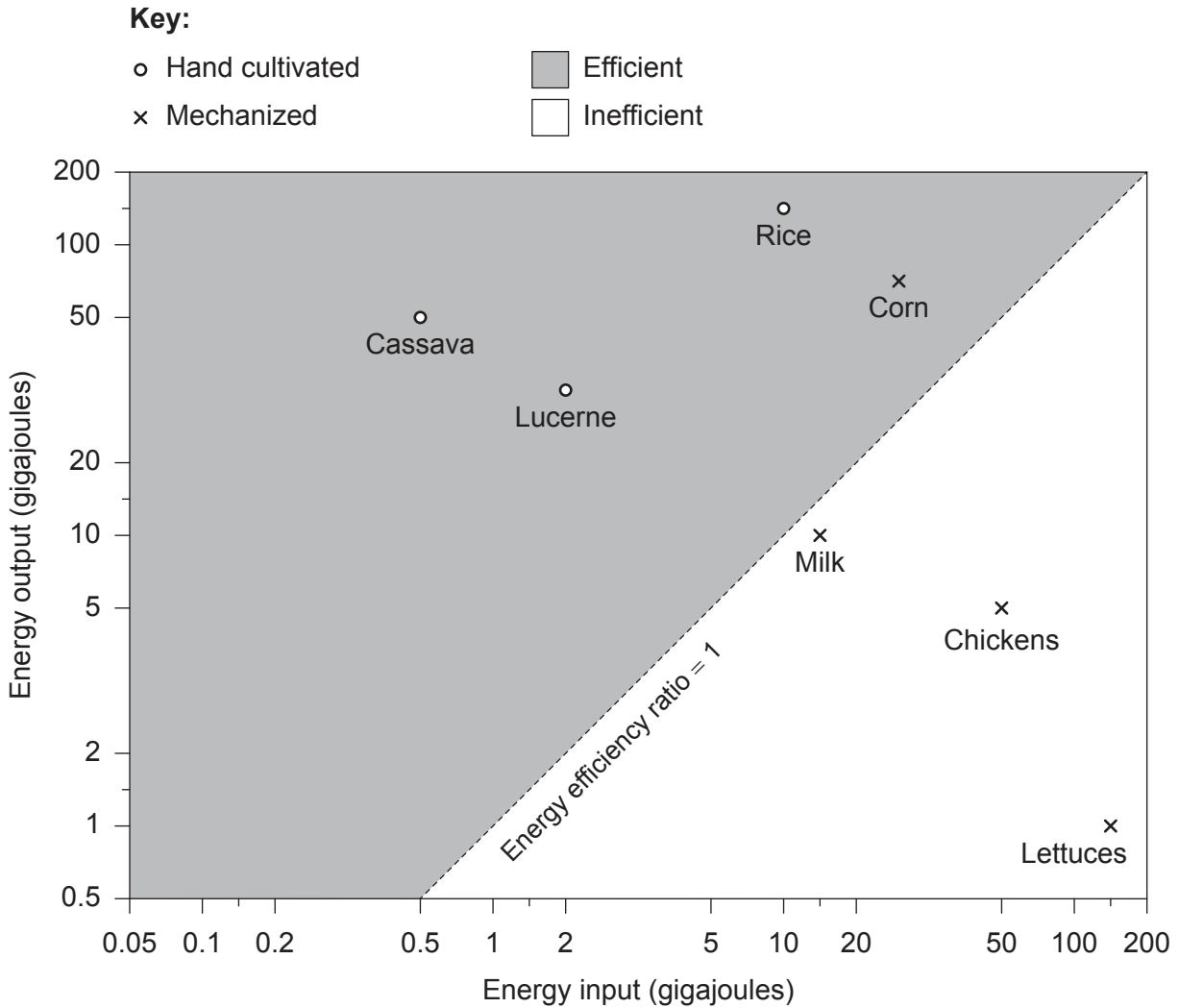
**End of Option E**

**Turn over**

**Option F — Food and health**

Answer the following question.

11. The simplified logarithmic graph shows the energy inputs and outputs for different farm products in gigajoules per hectare per year.



- (a) (i) Identify the farm product that has the lowest energy output. [1]
- (ii) Identify the farm product that has the highest energy efficiency. [1]
- (b) Outline **one** way in which energy input changes as a result of mechanization. [2]
- (c) Explain how food insecurity could be reduced by the use of:
  - (i) *in vitro* meat; [3]
  - (ii) vertical farming. [3]

**(Option F continues on the following page)**

**(Option F continued)**

Answer either part (a) or part (b).

**Either**

12. (a) To what extent are diseases linked to malnutrition? [10]

**Or**

12. (b) Examine how geographic factors affect the rate of diffusion of agricultural innovation. [10]

**End of Option F**

**Turn over**

**Option G — Urban environments**

Answer the following question.

13. Refer to the graph on page 5 of the accompanying resource booklet.

The graph shows the ten fastest growing cities in the world (2015–2020) and the number of new people added to each city per hour in 2020.

- (a) (i) State which city in Africa grew the most between 2015 and 2020. [1]
- (ii) Identify how many new people per hour were added to the city of Shanghai in 2020. [1]
- (b) Outline **one** environmental problem caused by the rapid population increase of cities. [2]
- (c) Explain why large cities continue to grow as a result of:
- (i) **one** economic factor; [3]
- (ii) **one** demographic factor. [3]

Answer either part (a) or part (b).

**Either**

14. (a) Examine the impacts of slum clearance schemes on **one or more** neighbourhoods. [10]

**Or**

14. (b) To what extent do centrifugal population movements affect residential areas of cities? [10]

**End of Option G**

5.

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**References:**

5. Hossain, A. et al., Agricultural Land Degradation: Processes and Problems Undermining Future Food Security, In: Fahad, S., et al. *Environment, Climate, Plant and Vegetation Growth*, pp. 17–61, 2020, Springer Nature. [https://link.springer.com/chapter/10.1007/978-3-030-49732-3\\_2](https://link.springer.com/chapter/10.1007/978-3-030-49732-3_2).
9. Krungsri Research. *Industry Outlook 2021–2023: Hotel Industry*. [online] Available at: <https://www.krungsri.com/en/research/industry/industry-outlook/Services/Hotels/IO/io-hotel-21> [Accessed 14 March 2022]. Source adapted.
- 11 Data from *Food policy*, Vol 1, Gerald Leach, Energy and food production, pages 62–73, Copyright Elsevier (1975).

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