# Geography
# Higher level
# Paper 1

3 November 2023

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

2 hours 15 minutes

## 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 |

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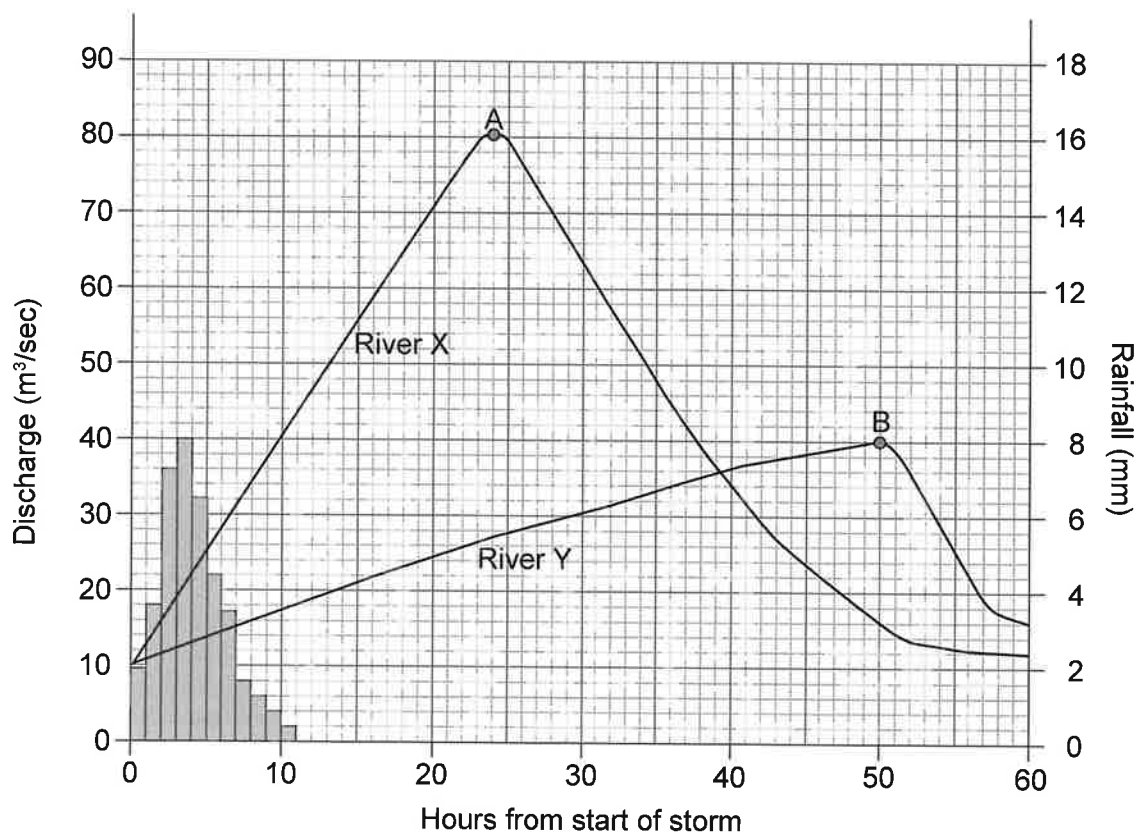© International Baccalaureate Organization 2023

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. The hydrograph shows the peak discharge of two contrasting **rural** drainage basins after a storm.



**Key:**
▦ Rainfall
▨ Discharge

(a) (i) State the peak rainfall, in millimetres, for the storm. [1]

(ii) State the time difference, in hours, between the peak discharges at point **A** and point **B**. [1]

(b) Outline **one** reason for the short lag time for river **X**, a rural drainage basin. [2]

(c) Explain **two** advantages of an integrated drainage basin management (IDBM) plan. [3 + 3]

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

**(Option A continued)**

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

**Either**

2. (a) Evaluate the effectiveness of **two or more** different ways of mitigating flood risk. [10]

**Or**

2. (b) Examine the power of different stakeholders in managing the consequences of agricultural activity on water quality. [10]

# End of Option A

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**Option B — Oceans and coastal margins**

Answer the following question.

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

The map shows the marine reserve around the Galápagos islands off the coast of Ecuador in South America.

(a)    (i)    Identify the island in the Galápagos that lies on the equator (0°).                    [1]

(ii)   Estimate, in $km^2$, the area of Isla San Cristóbal.                                        [1]

(b)    Apart from banning fishing, outline **one** other reason why the newly protected areas were created.                                                                              [2]

(c)    Explain **two** strategies (**other than** marine reserves) to reduce overfishing.         [3 + 3]

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

**Either**

4.    (a)    Examine the causes of ocean acidification **and** the possible impacts on coral reefs.   [10]

**Or**

4.    (b)    Examine how changes in relative sea level result in the formation of **two or more** coastal landforms.                                                                              [10]
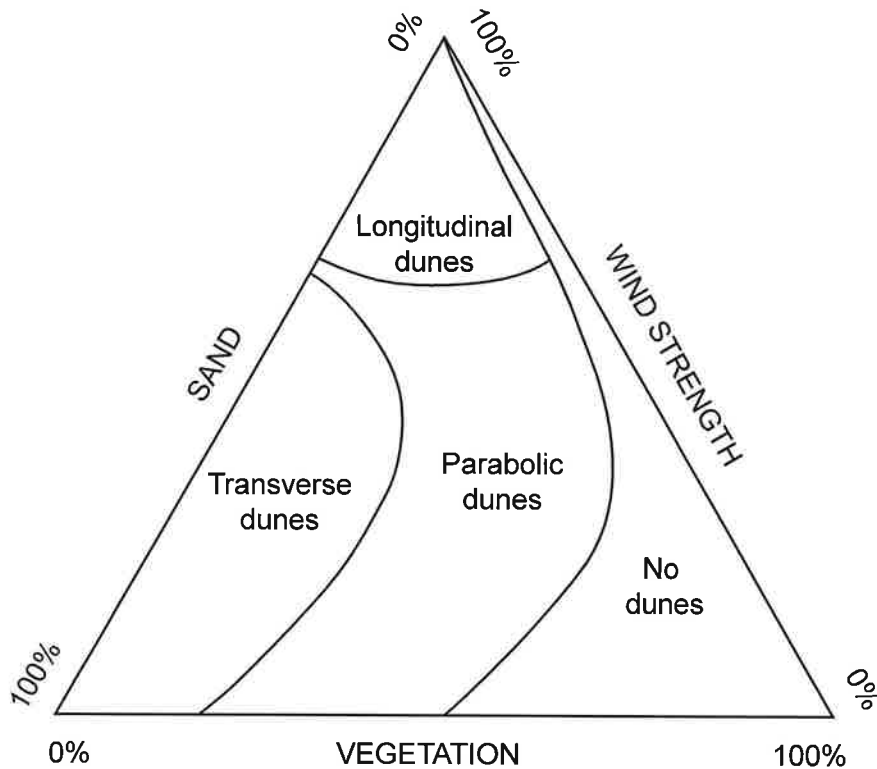
# End of Option B

**Option C — Extreme environments**

Answer the following question.

5.   The triangular graph shows the amount of sand, wind and vegetation needed to create different types of sand dune.



(a)  (i)   Identify which type of sand dune requires strong wind and a small amount of sand.                                                                                           [1]

     (ii)  Estimate the minimum percentage of sand required for the formation of transverse dunes.                                                                                [1]

(b)  Outline **one** reason why vegetation is important in dune formation.       [2]

(c)  Explain **two** weathering processes that occur in hot, arid environments.   [3 + 3]

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

**(Option C continued)**

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

**Either**

6.  (a)   Examine the challenges for local stakeholders caused by tourism in
            extreme environments.                                                                  [10]

    **Or**

6.  (b)   To what extent can the causes of desertification be successfully managed?   [10]


# End of Option C

**Option D — Geophysical hazards**

Answer the following question.

7. Refer to the diagram on page 3 of the accompanying resource booklet.

The diagram shows evidence of mass movement.

(a) Using evidence from the diagram, identify **one** effect of mass movement on:

    (i) the human landscape; [1]

    (ii) the physical landscape. [1]

(b) Outline **one** way in which human activity may increase the instability of a slope. [2]

(c) Explain why vulnerability to mass movement hazards might vary between communities due to:

    (i) **one** economic reason; *quality of housing* [3]

    (ii) **one** social reason. [3]

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

**Either**

8. (a) Examine reasons why some high-magnitude earthquakes have low-level impacts on people and property. [10]

**Or**

8. (b) To what extent are pre-event management strategies successful in reducing vulnerability to volcanic hazard events? [10]

# End of Option D

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

Answer the following question.

9.    Refer to the topographic map on pages 4–6 of the accompanying resource booklet.

The topographic map shows the town of Keswick in the Lake District, England. The scale of the map is 1:50 000.

(a) (i)    Identify the type of building found at grid reference 268236.                     [1]

(ii)    State the height difference, in metres, between spot heights **X** and **Y** on the map.                                                                              [1]

(b)    Using map evidence, outline **one** reason why the area around Keswick might be suitable as a festival site.                                                          [2]

(c)    Explain **two** management strategies to increase site resilience in rural tourist hotspot areas.                                                                       [3 + 3]

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

**Either**

10.  (a)   Examine the benefits and costs for different stakeholders of the involvement of transnational corporations (TNCs) in expanding tourism.                      [10]

**Or**

10.  (b)   To what extent is participation in leisure activities in different societies related to economic development?                                                    [10]
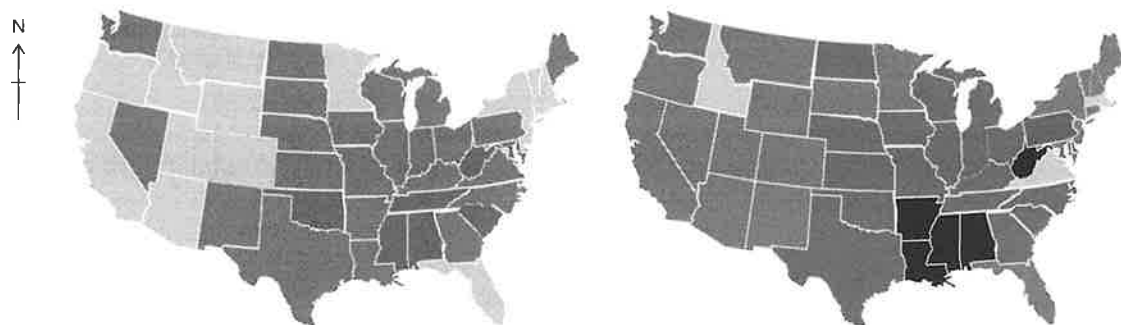
# End of Option E

**Option F — Food and health**

Answer the following question.

11. The maps show the percentage of people who were obese (as a result of high food consumption) in mainland USA in 2008 and 2016.

2008                                    2016



**Key:**

● 20–24%  ● 25–29%  ● 30–34%  ● ≥35%

(a) (i) State the number of USA states in 2016 that had an obesity level of ≥35%. [1]

(ii) Using a compass direction, identify the area of the USA that had mainly 20–24% obesity levels in 2008. [1]

(b) Outline **one** possible reason why most of the USA states showed increased levels of obesity in 2016. [2]

(c) Explain **two** consequences of the disease burden on society resulting from an ageing population. [3 + 3]

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

**Either**

12. (a) To what extent are agribusiness transnational corporations (TNCs) the most important influence on food consumption habits? [10]

**Or**

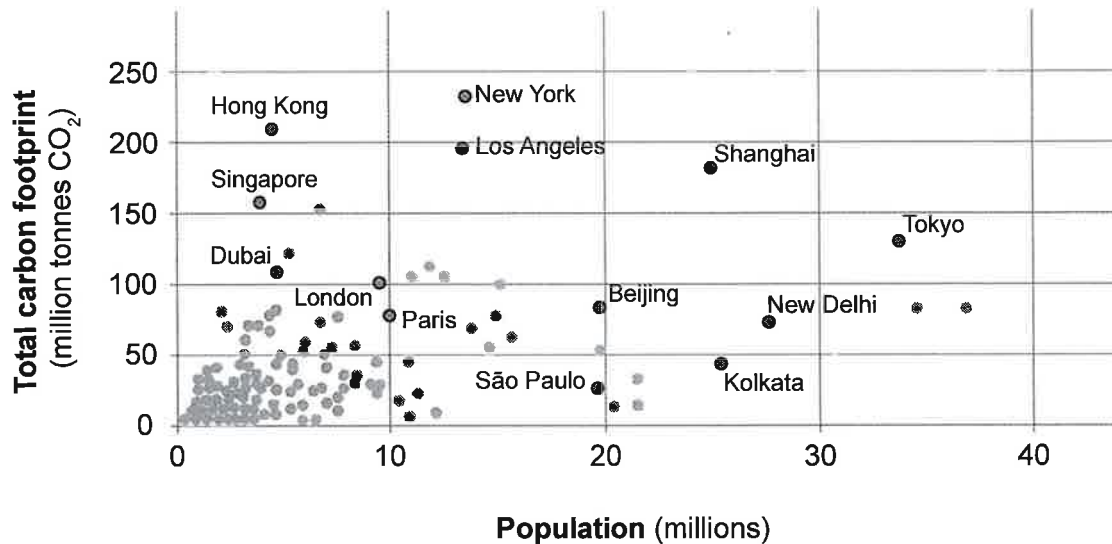12. (b) To what extent do economic factors influence the diffusion of disease? [10]

# End of Option F

## Option G — Urban environments

Answer the following question.

13. The graph shows the total carbon footprint of selected cities and their populations for 2019.



**Population** (millions)

√ (a)  (i)  Estimate the carbon footprint, in millions of tonnes of $CO_2$, of New York. ≈ 35      [1]

(ii)  State the relationship between population and carbon footprint.      [1]

✓ (b)  Outline **one** reason why some small cities have very high carbon emissions.      [2]

√ (c)  Explain **two** eco city design strategies to reduce the urban ecological footprint.      [3 + 3]

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

**Either**

14. (a)  Evaluate the success of strategies to reduce the impacts of air pollution on people in **one or more** urban areas.      [10]

**Or**

14. (b)  To what extent has urban growth been accompanied by improvements in infrastructure?      [10]

# End of Option G

**References:**

5.      University of Maryland, Department of Geology, 2021. *Terrestrial sedimentary environments IV - Deserts and Eolian*. [online] Available at: https://www.geol.umd.edu/~jmerck/geol342/lectures/11.html [Accessed 29 November 2022]. SOURCE ADAPTED.

11.     Blumenthal, D., and Seervai, S., 2018. Rising Obesity in the United States is a Public Health Crisis. *The Commonwealth Fund*, [blog] 24 April. Available at: https://www.commonwealthfund.org/blog/2018/rising-obesity-united-states-public-health-crisis [Accessed 7 November 2022]. SOURCE ADAPTED.

13.     NASA Earth Observatory, n.d. *Sizing Up the Carbon Footprint of Cities*. [online] Available at: https://earthobservatory.nasa.gov/images/144807/sizing-up-the-carbon-footprint-of-cities [Accessed 7 November 2022]. SOURCE ADAPTED.