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Environmental systems and societies
Higher level
Paper 1

30 April 2026

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

Session number

2 hours

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Instructions to students

- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Answer all questions. Refer to the resource booklet which accompanies this question paper.
- Answers must be written within the answer boxes provided.
- A calculator is required for this paper.
- The maximum mark for this examination paper is **[70 marks]**.



Answer **all** questions. Answers must be written within the answer boxes provided.

1. (a) Using **Figure 2(d)**, identify the abiotic factor that most limits productivity and biodiversity in the Atacama Desert surrounding the city of Antofagasta. [1]

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- (b) Using **Figure 2(d)**, evaluate **one** appropriate renewable option for electrical energy in terms of energy security and economic benefit for Antofagasta and the economy of northern Chile. [4]

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- (c) With reference to **Figure 2(e)** and **Figure 2(f)**, outline the role of differences in air density on the average annual temperature of Antofagasta. [2]

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- (d) Using **Figure 2(g)**, identify the ecosystem with the highest carbon storage in the Punta Arenas region. [1]

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(This question continues on the following page)



(Question 1 continued)

- (e) Using **Figure 2(d)** and **Figure 2(g)**, explain how the carbon storage process is influenced by climate in the ecosystems around Punta Arenas.

[2]

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- (f) With reference to **Figure 2(h)** and **Figure 2(i)**, explain how topographical factors in the region impact the development of a sustainable forestry industry.

[3]

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2. (a) Using **Figure 3(a)** and **Figure 3(b)**, draw a pyramid of energy that includes the huemul. [1]

- (b) With reference to **Figure 3(b)**, outline how the spread of feral red deer across the Andes could impact the huemul population positively and negatively. [2]

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- (c) With reference to **Figure 3(d)**, describe how global warming could impact the carrying capacity of huemul in their natural habitat. [3]

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(This question continues on the following page)



(Question 2 continued)

- (d) With reference to **Figure 3(b)**, **Figure 3(d)** and **Figure 3(e)**, outline the effectiveness of a specific *in situ* conservation strategy to improve the IUCN category of the huemul. [4]

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- (e) With reference to **Figure 3(c)** and **Figure 3(d)**, discuss how the concepts of instrumental and intrinsic value are not exclusive when applied to the huemul. [2]

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- (f) Using the information in **Figure 3(f)** and **Figure 3(g)**, outline the evidence that Chile is making progress towards UN Sustainable Development Goal (SDG) 15. [1]

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3. (a) Using the information in **Figure 4(a)**, calculate the percentage increase in the number of aquaculture locations, assuming all those awaiting approval are granted permission to proceed.

[1]

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- (b) With reference to **Figure 4(a)** and **Figure 4(b)**, describe the impacts of aquaculture operations and fishing on the tourism industry in the Francisco Coloane Marine Park (FCMP).

[2]

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- (c) With reference to **Figure 4(a)**, list **two** stakeholders whose cooperation could aid in the recovery of the demersal fisheries.

[1]

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- (d) With reference to **Figure 4(a)** and **Figure 4(b)**, outline **two** challenges in the use of maximum sustainable yield (MSY) as a guide to the management of demersal fisheries by the Chilean Fisheries Service.

[2]

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4. (a) Identify **one** trend in glacial loss percentage from **Figure 5(a)**. [1]

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- (b) With reference to **Figure 5(c)**, identify **two** forms of natural capital provided by glaciers. [2]

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- (c) Using **Figure 5(c)**, describe **two** negative impacts of glacier retreat on the local human communities. [2]

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- (d) Using **Figure 5(d)** and **Figure 5(e)**, discuss the sustainability of desalination of sea water as a climate change adaptation strategy for mines in Chile. [4]

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5. (a) In addition to assessing environmental concerns, environmental impact assessments (EIAs) investigate the social impacts of a development project. Identify a potential negative social impact related to developing an open pit copper mine in the Atacama Desert.

[1]

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- (b) Prior to opening in 1990, the Escondida mine studied the sea squirt (*Pyura stolonifera*), shown in **Figure 6(g)**, to monitor the impact of dumping mine tailings in the Pacific Ocean. Evaluate the choice of using the sea squirt as an indicator species as part of the mine's EIA.

[4]

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- (c) Using **Figure 6(d)** and **Figure 6(e)**, outline **two** potential human health impacts of the mines on the residents of the city of Calama.

[2]

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(Question 5 continued)

- (d) Using **Figure 6(e)** and **Figure 6(f)**, describe how globalization in the copper production industry has impacted Chile. [2]

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- (e) Outline how the mining regulations in Chile demonstrate principles of environmental law. [6]

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6. (a) Using **Figure 7(a)**, identify the largest source of electrical energy in Chile in 2015. [1]

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- (b) Using **Figure 7(a)** and **Figure 7(b)**, discuss possible reasons why the value of the coal mining industry in Chile has changed. [2]

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- (c) Compare and contrast the trends in renewable electricity production from 2011 to 2023, as shown in **Figure 7(a)**. [3]

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- (d) Deduce **one** reason why CO₂ emissions are greater from transport than from industry, as shown in **Figure 7(c)**. [2]

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[6]



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