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Environmental systems and societies
Standard level
Paper 2

4 May 2026

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

Session number

2 hours

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Instructions to students

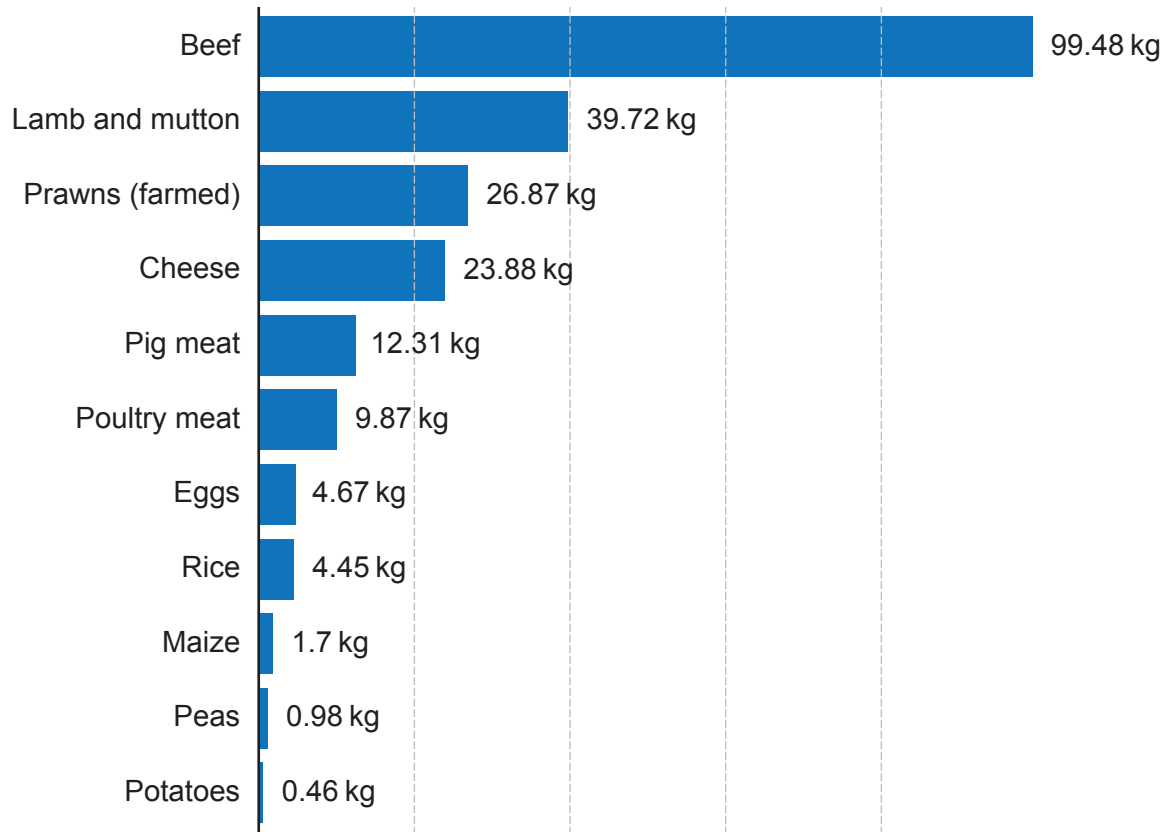
- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Section A: answer all questions.
- Section B: answer one question.
- Answers must be written within the answer boxes provided.
- A calculator is required for this paper.
- The maximum mark for this examination paper is **[60 marks]**.



Section A

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

Figure 1: Greenhouse gas emissions per kilogram of food product



1. (a) Identify the plant-based food that produces the highest greenhouse gas emissions. [1]

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- (b) State **two** greenhouse gases emitted from food production systems shown in **Figure 1**. [1]

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- (c) (i) Using the information in **Figure 1**, state whether greenhouse gas emissions are higher from plant-based foods or animal-based foods. [1]

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- (ii) Describe **two** reasons for the answer stated in (c)(i). [2]

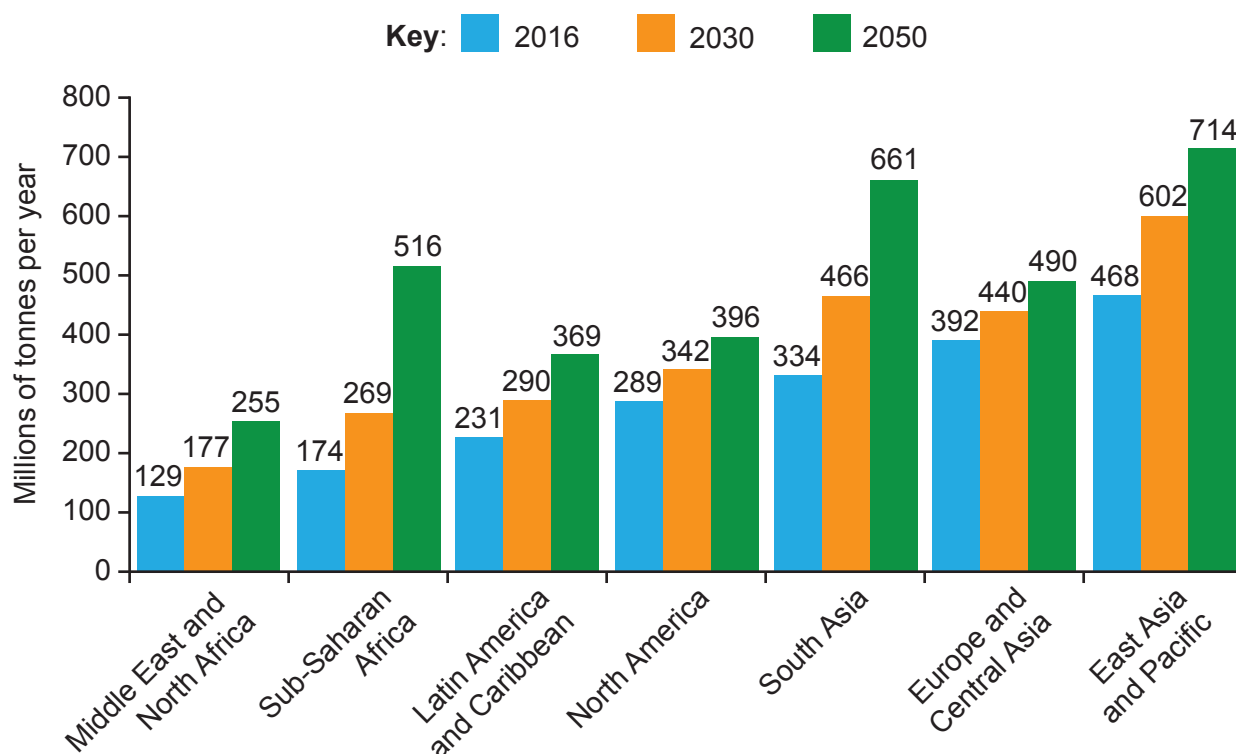
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- (d) Evaluate **one** strategy to mitigate the greenhouse gas emissions associated with beef production. [3]

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Figure 2: Projected waste generation by region, compared to 2016 levels



2. (a) Calculate the projected percentage increase in waste generation in south Asia between 2016 and 2050, shown in **Figure 2**.

[1]

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- (b) Outline **two** reasons for the trend in sub-Saharan Africa over the given period, shown in **Figure 2**.

[2]

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(This question continues on the following page)



(Question 2 continued)

- (c) (i) State **two** non-biodegradable materials present in solid domestic waste. [1]

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- (ii) Describe **two** negative impacts of non-biodegradable waste on ecosystems. [2]

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- (d) (i) Outline **one** preventative strategy **and one** restorative strategy to reduce the global trend in the production of solid domestic waste, as shown in **Figure 2**. [2]

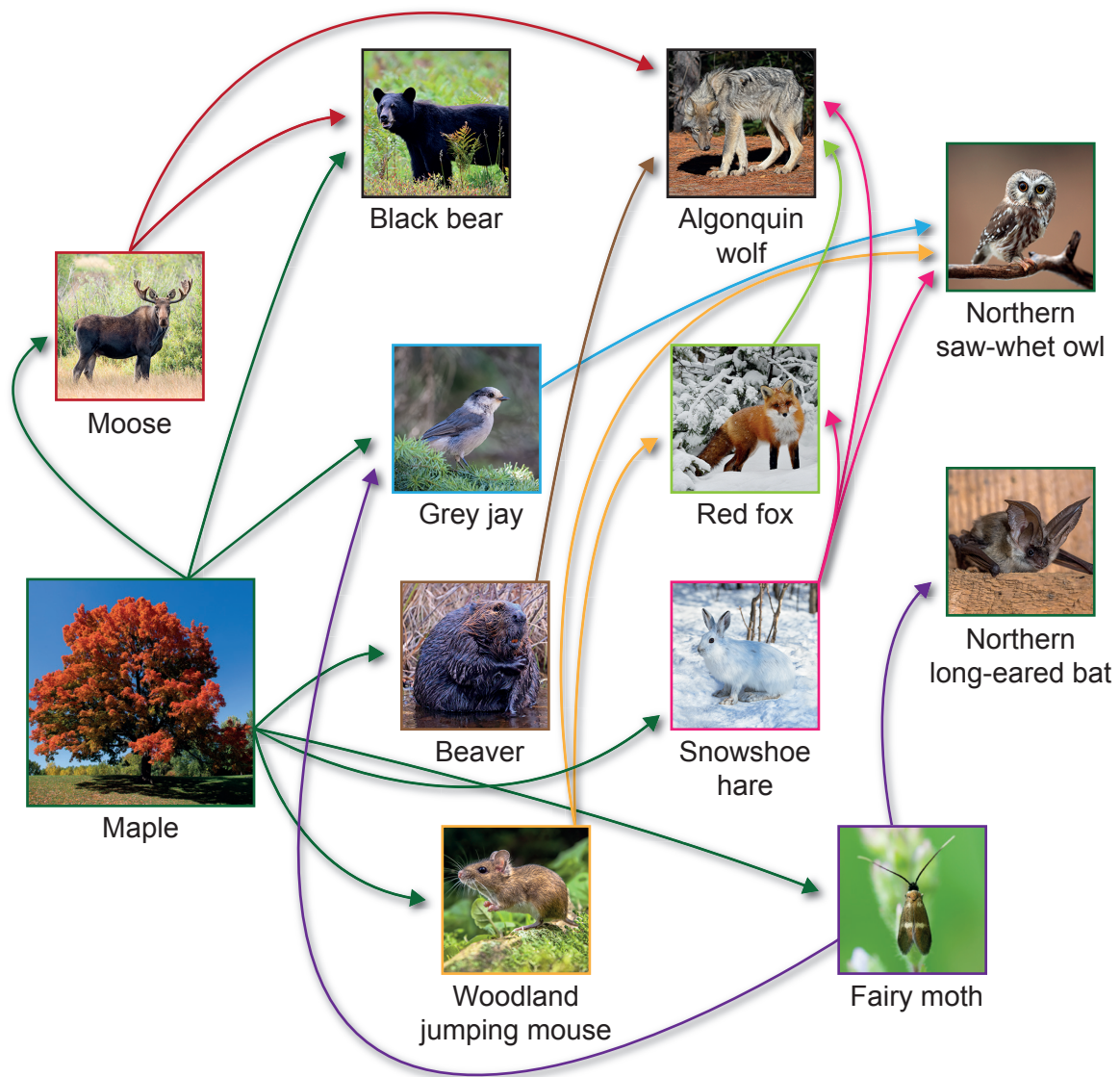
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- (ii) Justify why preventative strategies are more effective than restorative strategies for ecosystem sustainability. [2]

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Figure 3: Simplified provincial park food web



3. (a) (i) Identify the trophic level of the red fox shown in **Figure 3**. [1]

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- (ii) With reference to **Figure 3**, explain the impacts of increased red fox numbers on other organisms. [2]

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- (b) List the data required to convert the food web into a pyramid of energy. [2]

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- (c) (i) State the term for total gain in biomass by an organism. [1]

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- (ii) Using named examples from **Figure 3**, explain the energy transfer between producer and primary consumer. [2]

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(This question continues on page 9)



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Answers written on this page
will not be marked.



(Question 3 continued)

- (d) State **three** structural features that can be used to construct dichotomous keys for the animals in **Figure 3**.

[2]

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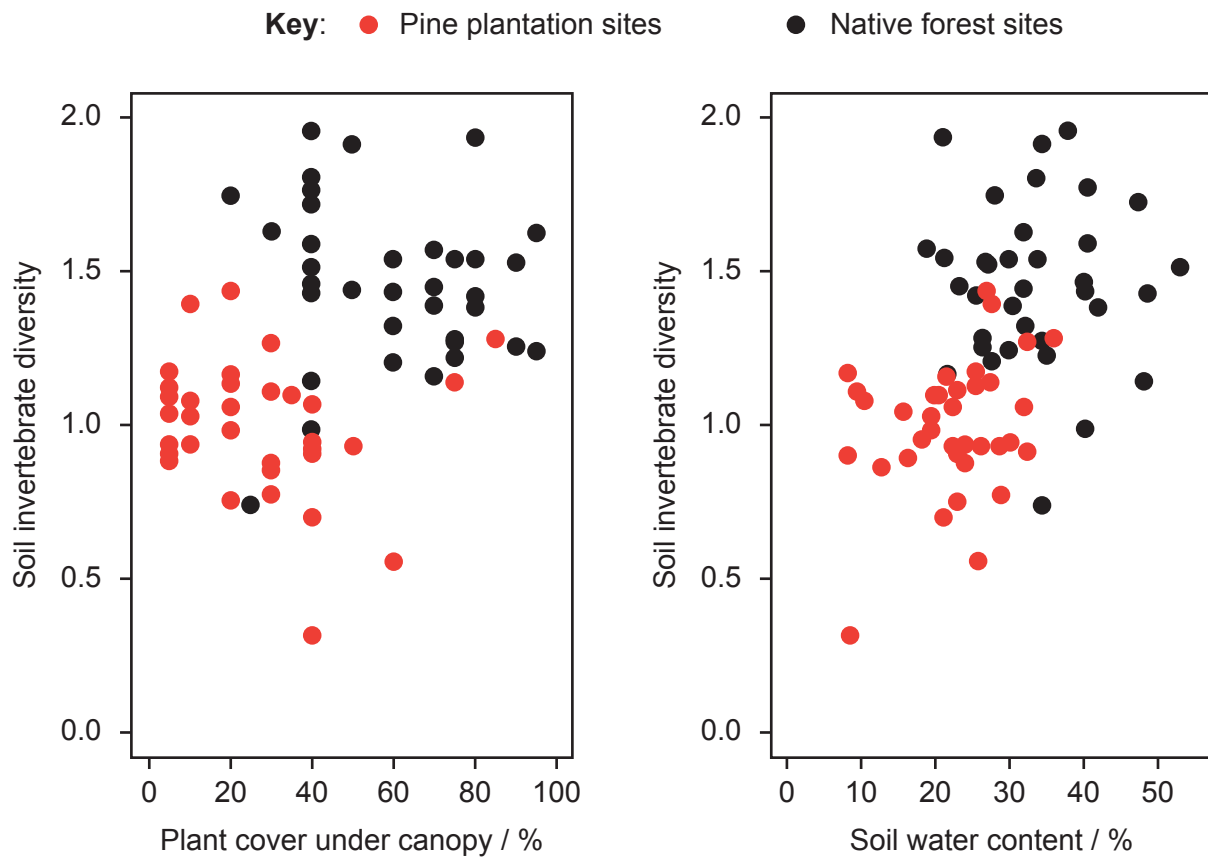
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Figure 4: Changes in soil invertebrate diversity in native forest sites and pine plantation sites in El Maule, central Chile



4. (a) With reference to **Figure 4**, identify **one** biotic **and one** abiotic factor that were monitored. [1]

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- (b) (i) Describe a method to estimate the soil invertebrate diversity in the two forest systems shown in **Figure 4**. [4]

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- (ii) Outline **one** factor that could decrease the accuracy of the method described in (b)(i). [1]

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- (iii) Outline how data on soil invertebrate diversity shown in **Figure 4** could be used by ecologists. [1]

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(This question continues on the following page)



(Question 4 continued)

- (c) Using the data in **Figure 4**, suggest why the soil invertebrate diversity is higher in native forest sites than in pine plantations.

[2]

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- (d) Construct a system diagram for the soil system in **Figure 4**, including two storages and two flows.

[3]



Section B

Answer **one** question. Answers must be written within the answer boxes provided.

5. (a) State **two** sources of particulate matter (PM) **and two** negative impacts they could cause in urban areas. [4]
- (b) Explain how acid deposition may impact the biotic components of a forest–river ecosystem. [7]
- (c) To what extent is an anthropocentric approach, as opposed to a technocentric approach, the most effective strategy for managing urban air pollution? [9]
6. (a) Identify **four** possible impacts of urban sprawl on the surrounding terrestrial ecosystems. [4]
- (b) Using named examples for both, explain how the reintroduction of apex predators and keystone species can impact biodiversity. [7]
- (c) “The world is reaching the tipping point beyond which climate change may become irreversible.” Kofi Annan, former Secretary-General of the United Nations (UN). Discuss the validity of this statement. [9]



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