

External assessment 2025

Multiple choice question book

Earth & Environmental Science

Paper 1

General instruction

- Work in this book will not be marked.



Queensland
Government

QCAA

Queensland Curriculum
& Assessment Authority

Section 1

Instruction

- Respond to these questions in the question and response book.
-

QUESTION 1

Identify an impact of an open-cut mine on the atmosphere.

- (A) decreased soil stability due to land clearing
- (B) increased run-off of mine-affected water
- (C) habitat loss due to land clearing
- (D) generation of dust from blasting

QUESTION 2

What is the difference between metallic and non-metallic resources?

	Metallic resources	Non-metallic resources
(A)	generally require complex refining such as smelting	generally only require separation
(B)	found on the left of the periodic table	found on the right of the periodic table
(C)	found in sedimentary formations	generally found in igneous formations
(D)	extracted as ores	extracted as pure substances

QUESTION 3

Melting of sea ice is a consequence of global change that occurs in the

- (A) hydrosphere.
- (B) atmosphere.
- (C) geosphere.
- (D) biosphere.

THIS PAGE WILL NOT BE MARKED

QUESTIONS 4–5

Questions 4–5 refer to the diagram of a tectonic plate boundary shown.

This content has been redacted for copyright purposes.

Redacted unlabelled image is similar to Subduction Fault Zone Diagram at Understanding the Earth's Structure: A Guide to Tectonic Plates - Geography Realm <https://www.geographyrealm.com/the-earths-tectonic-plates/>

QUESTION 4

Identify the feature marked X.

- (A) deep sea trench
- (B) subducting plate
- (C) volcanic hot spot
- (D) transform boundary

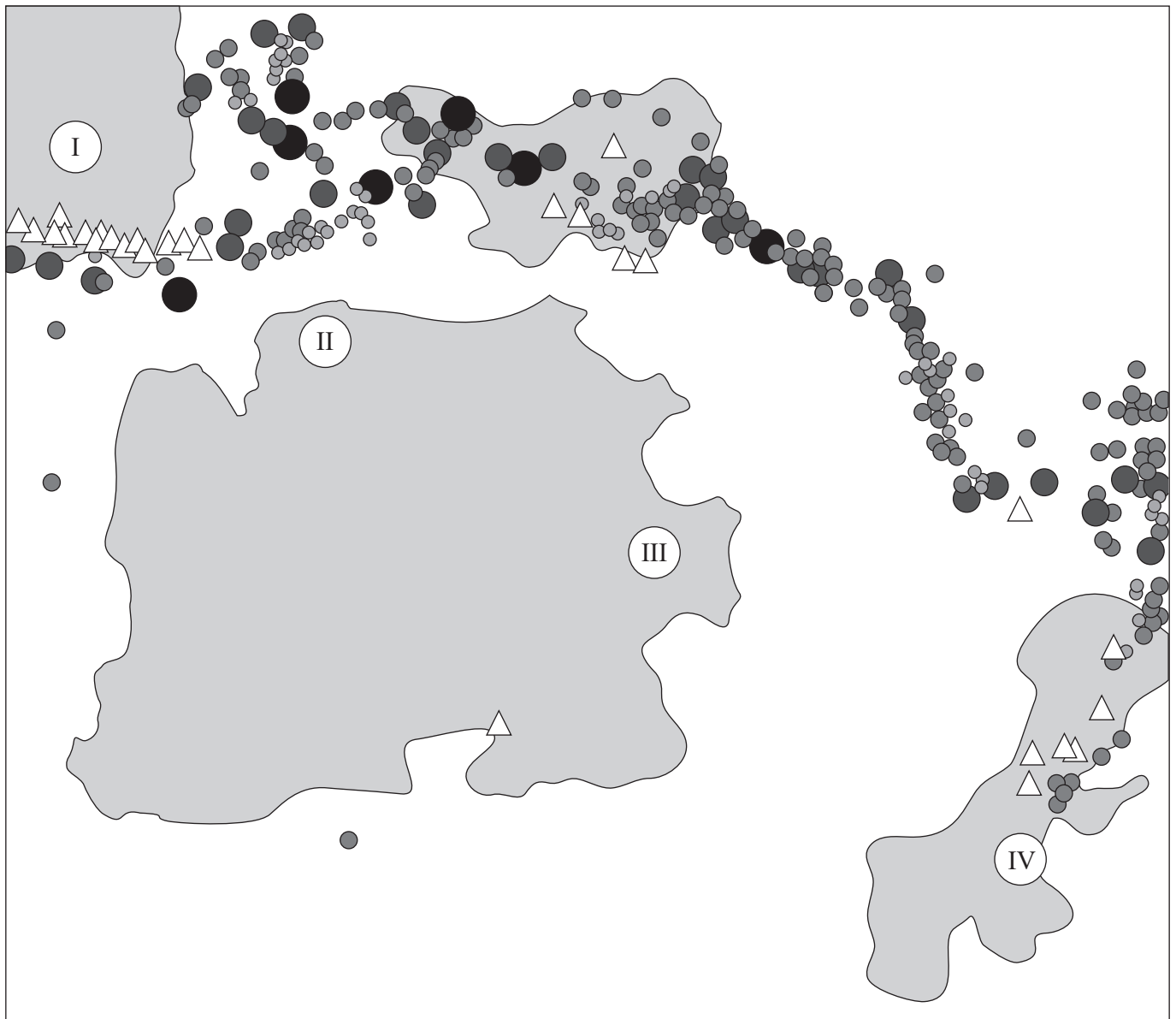
QUESTION 5

Which option best describes the hazards associated with the process occurring at X?

	Earthquakes	Volcanoes	Tsunamis
(A)	high magnitude	composite	likely
(B)	high magnitude	shield	unlikely
(C)	low magnitude	composite	unlikely
(D)	low magnitude	shield	likely

QUESTION 6

The map shows the locations of major earthquakes and active volcanoes.



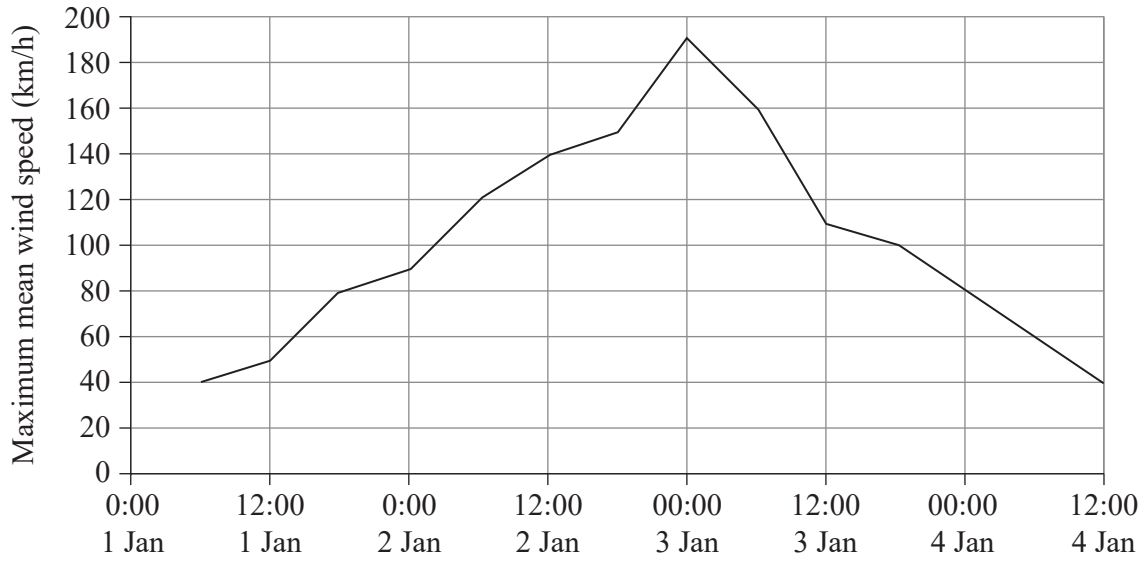
Key
Earthquake magnitude ● 7.0–7.4 ● 7.5–7.9 ● 8.0–8.4 ● 8.5+
△ Active volcanoes ■ Land □ Water

Nuclear power stations require geologically stable sites that minimise hazards to operate safely. Which site is most suitable for a nuclear power station?

- (A) I
- (B) II
- (C) III
- (D) IV

QUESTION 7

The graph shows the mean wind speed of Tropical Cyclone Russell in January 2023 and the table shows cyclone wind categories.



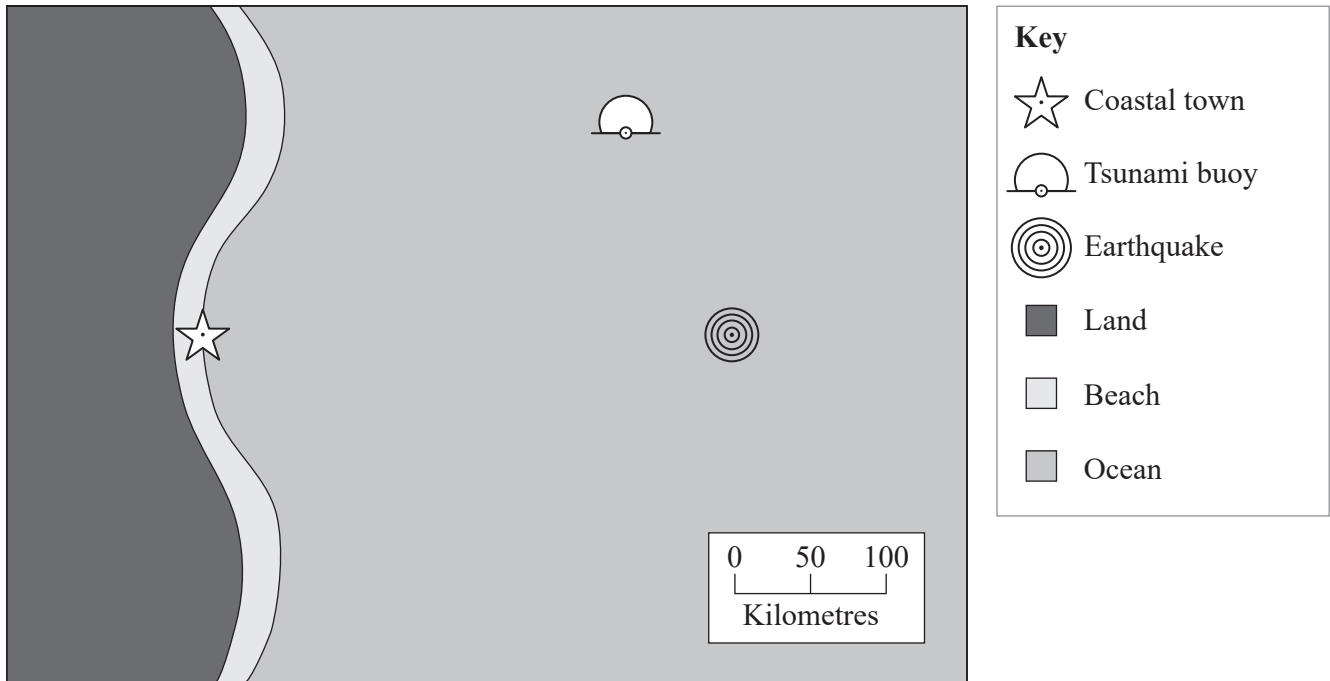
Category	Maximum mean wind speed (km/h)	Typical strongest gust (km/h)
1	63–88	<125
2	89–117	125–164
3	118–159	165–224
4	160–199	225–279
5	>199	>279

Determine when Tropical Cyclone Russell was downgraded to a category 2, to the nearest hour.

- (A) 2 Jan at 12:00
- (B) 2 Jan at 05:00
- (C) 3 Jan at 11:00
- (D) 3 Jan at 20:00

QUESTION 8

The map shows the locations of a coastal town, a tsunami detection buoy and the epicentre of an earthquake.



The earthquake caused a tsunami, which moved at an average speed of 12.5 km/min. When it was detected by the tsunami detection buoy, the coastal town was alerted immediately.

Calculate the amount of warning time the coastal town had, to the nearest minute.

- (A) 12 minutes
- (B) 16 minutes
- (C) 24 minutes
- (D) 28 minutes

QUESTION 9

Which option is a supporting ecosystem service?

- (A) soil formation
- (B) food generation
- (C) natural pest control
- (D) carbon sequestration

THIS PAGE WILL NOT BE MARKED

QUESTION 10

Who must be consulted when seeking licensing and permission for land access and resource exploration?

- (A) police service
- (B) local government
- (C) energy companies
- (D) native title holders

QUESTION 11

Which groundwater extraction scenario is the most sustainable?

	Aquifer 1 (replenishment rate 150 kL/year)	Aquifer 2 (replenishment rate 80 kL/year)
	Bore extraction rate (kL/year)	Bore extraction rate (kL/year)
(A)	80	150
(B)	140	70
(C)	150	80
(D)	160	70

QUESTION 12

A commercial fishery unintentionally overharvested a population of fish one year.

Why was the fishery closed the following year?

- (A) The fishery collapsed due to overharvesting of the fish population.
- (B) The fish population would continue to decline for a few years before it recovered.
- (C) The fish population would require time to recover to a sustainably harvestable level.
- (D) The remaining fish would be too small and require a few years to mature to a harvestable size.

THIS PAGE WILL NOT BE MARKED

QUESTION 13

Which strategy for managing freshwater availability during a drought has the most sustainable ecological footprint?

- (A) activating a desalination plant
- (B) pumping water from an adjacent water catchment
- (C) constructing new water reservoirs with covers to reduce evaporation
- (D) reducing water consumption to a level lower than the replenishment rate

QUESTION 14

Identify the observed relationship between atmospheric carbon dioxide and global temperatures over the past century.

	Atmospheric carbon dioxide	Global temperatures
(A)	increased	increased
(B)	increased	decreased
(C)	decreased	increased
(D)	decreased	decreased

QUESTION 15

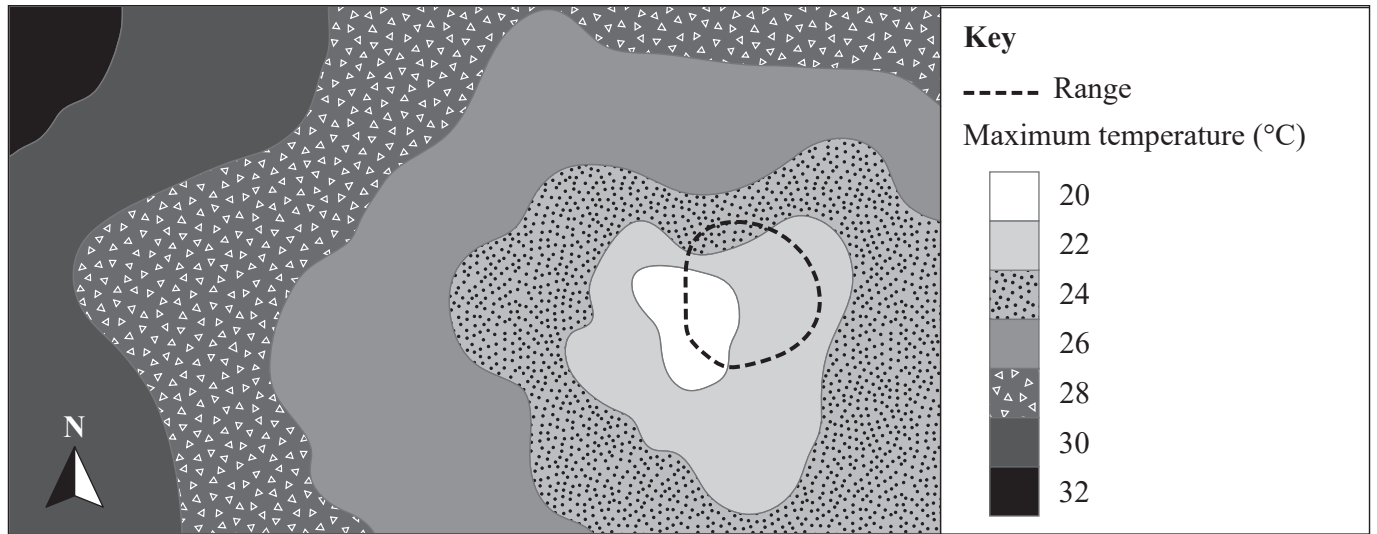
The table shows water quality guidelines and monitoring results from four run-off catchment dams (A–D) on a mine site.

Identify the location where water quality was outside guidelines.

	Parameter						
	pH	Electrical conductivity ($\mu\text{S}/\text{cm}$)	SO_4 (mg/L)	Cu (mg/L)	Pb (mg/L)	Zn (mg/L)	Fe (mg/L)
Guidelines	6–9	<7700	<1000	<5	<5	<5	<10
(A)	7.85	1440	40	0.003	0.203	4.33	0.77
(B)	8.01	1580	31	0.003	0.022	4.83	0.11
(C)	5.85	975	398	0.495	0.001	2.99	1.00
(D)	6.54	3140	975	0.410	0.001	1.79	3.36

QUESTION 16

The dotted line shows the current range of a small mammal in a region of central Queensland.

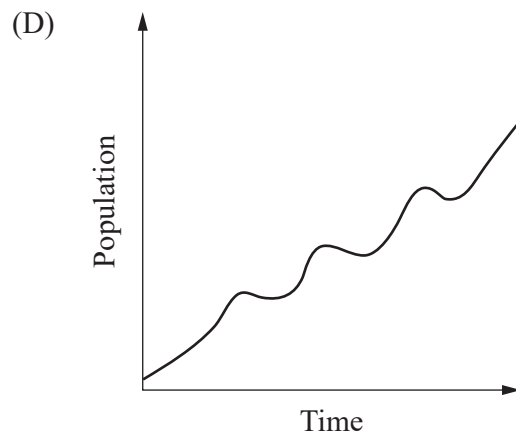
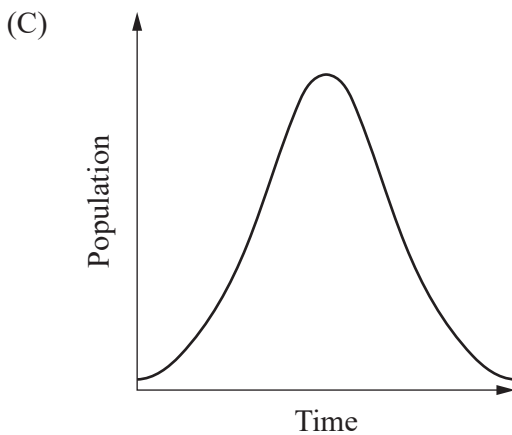
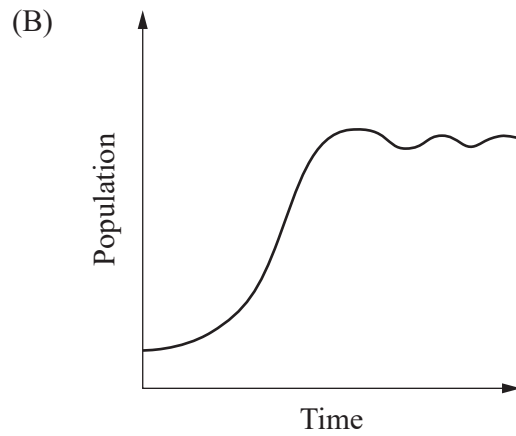
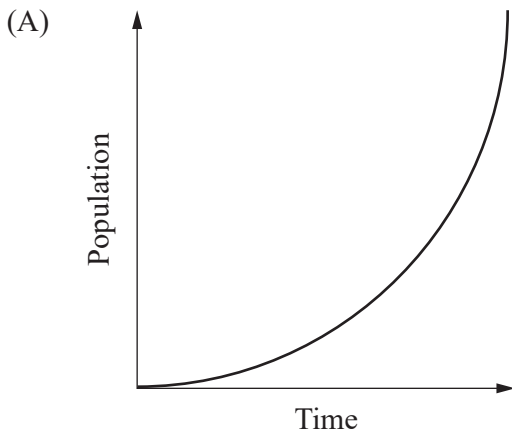


Identify the most likely consequence of a 2 °C increase in maximum temperature on the distribution of the species.

- (A) The range would increase.
- (B) The range would decrease.
- (C) The population would shift north-east.
- (D) The population would shift south-east.

QUESTION 17

Which population graph represents a species being harvested at its maximum sustainable yield?



QUESTION 18

Which option demonstrates the use of a renewable resource at a local scale?

- (A) a hot sedimentary aquifer heating a public swimming pool
- (B) lithium batteries being used to power a portable refrigerator while camping
- (C) a natural gas-fuelled generator powering essential hospital equipment during a blackout
- (D) pumped hydro storage being used for long-term energy storage in Queensland's energy system

THIS PAGE WILL NOT BE MARKED

QUESTION 19

A remote sensing technique used for locating minerals is

- (A) chemical analysis.
- (B) satellite imagery.
- (C) core sampling.
- (D) hydrogeology.

QUESTION 20

The banks of a river experienced mass erosion during a recent flood event. The flood event was considered minor compared to previous flood events.

Which scenario is the most scientifically plausible reason for the mass erosion?

- (A) Excess stormwater was now being diverted over the riverbank during heavy rains.
- (B) Plant revegetation during the previous year had stabilised the soil along the riverbank.
- (C) The river had naturally changed its course and slowly eroded the riverbank before the flood.
- (D) The region was recovering from a long drought that had reduced the vegetation on the riverbanks.

References

Question 4

Redacted unlabelled image is similar to Subduction Fault Zone Diagram at Understanding the Earth's Structure: A Guide to Tectonic Plates - Geography Realm

Question 7

Based on Bureau of Meteorology (2020). *Tropical cyclone categories* <https://www.bom.gov.au/resources/learn-and-explore/tropical-cyclone-knowledge-centre/tropical-cyclone-categories>

Data and information provided in this paper may have been developed or adjusted for exam purposes and should not be taken as factual.



© State of Queensland (QCAA) 2025

Licence: <https://creativecommons.org/licenses/by/4.0> | Copyright notice: www.qcaa.qld.edu.au/copyright — lists the full terms and conditions, which specify certain exceptions to the licence. Third-party materials referenced above are excluded from this licence. | Attribution: © State of Queensland (QCAA) 2025