External assessment 2024

Multiple choice question book

Marine 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 the factor most responsible for change in the Great Barrier Reef over the past 20 000 years.

(A) sea levels rising

(B) continental drift

(C) the Triassic extinction event

(D) a decrease in sea surface temperature

QUESTION 2

Herbivorous fish benefit hard coral most by

(A) minimising bioerosion.

(B) reducing macroalgae cover.

(C) competing with corallivorous fish for food.

(D) providing beneficial pathogens in their faeces.

QUESTION 3

Identify an anthropogenic factor that influences the distribution of coral.

(A) rugosity

(B) upwelling

(C) dissolved oxygen

(D) ocean acidification

QUESTION 4

What is the main issue preventing aquaculture from addressing food security specific to low-income countries?

(A) access to reliable technology

(B) limited suitable space

(C) species suitability

(D) threat of disease

QUESTION 5

The processes of coral larval dispersal, settlement and post-settlement survival are collectively known as

(A) site selection.

(B) reproduction.

(C) connectivity.

(D) recruitment.

QUESTION 6

Which option is a major Australian edible seafood import product?

(A) prawns

(B) abalone

(C) fish meal

(D) rock lobster

QUESTION 7

The precautionary principle should be applied to ecosystem management decisions when

(A) there is strong evidence to support the decision.

(B) a decision results in a long-term, negative impact on habitat.

(C) there is limited scientific knowledge on the impact of a threat.

(D) all other ecosystem management strategies have been exhausted.

QUESTION 8

Why does Australia import seafood?

(A) Most imported seafood is more affordable.

(B) There is no demand for exported seafood in Australia.

(C) There is insufficient supply of Australian-caught seafood.

(D) There is considerable demand for high-value seafood products in Australia.

QUESTION 9

Ecosystem-based fisheries management ensures that

(A) fishing benefits are prioritised over other considerations.

(B) a fishery produces the maximum possible number of fish.

(C) the size of a fish stock is managed and able to be regulated.

(D) a fishery is supported by managing multiple marine species and habitats.

QUESTION 10

The limestone skeleton of coral is built when

(A) ocean pH is low.

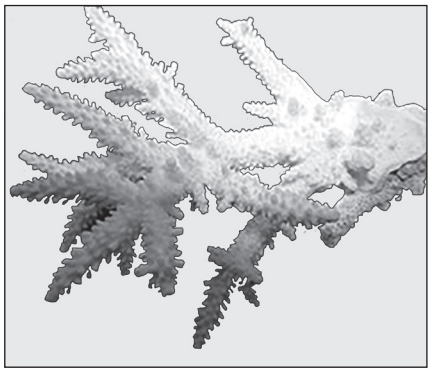
(B) light levels are low.

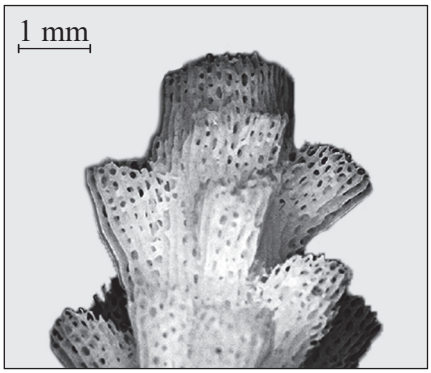
(C) sea surface temperature is high.

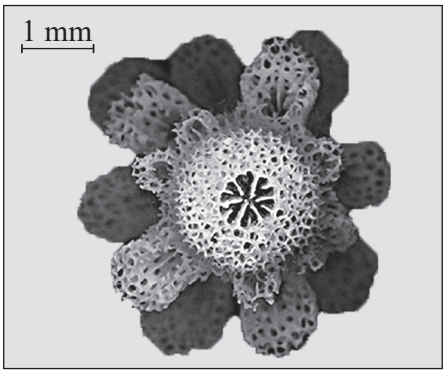
(D) carbonate ion concentration is high.

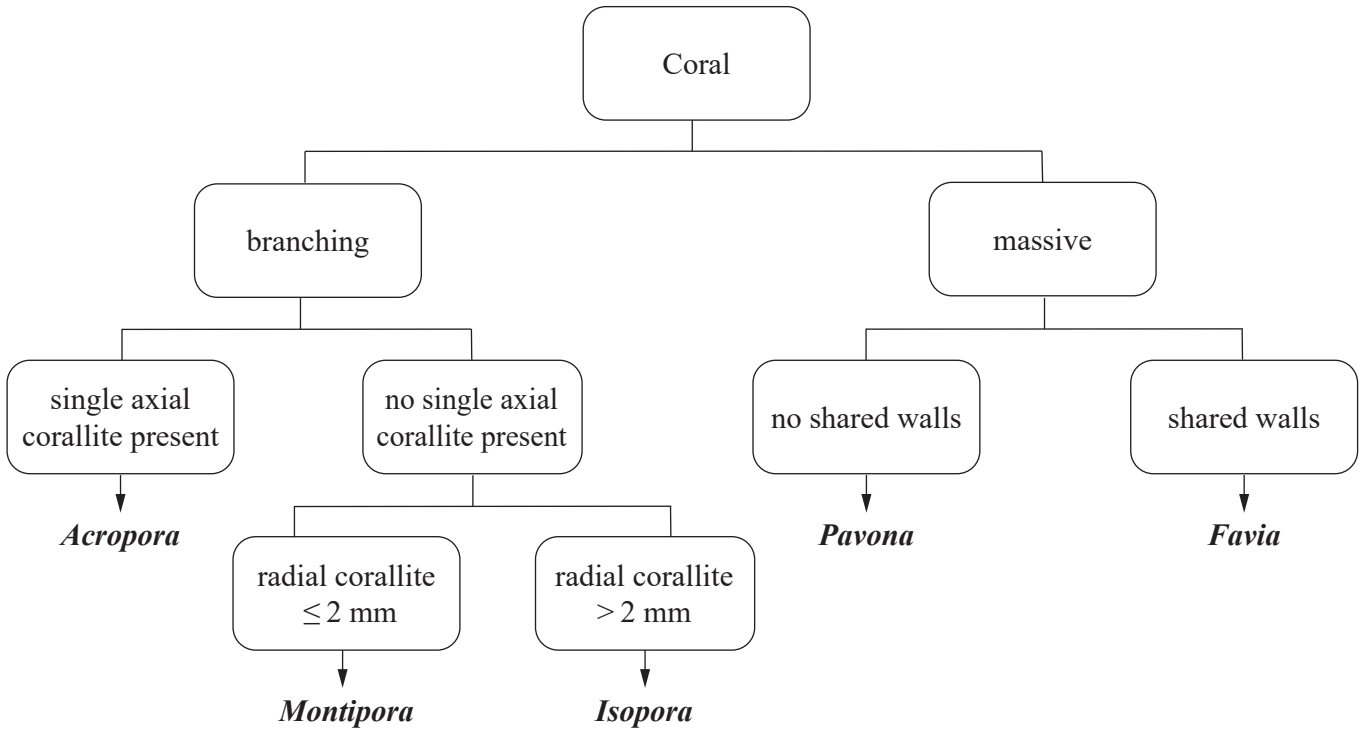
QUESTION 11

The structure of a coral colony and a classification key showing the genus of five common corals are shown.









Identify the coral genus shown.

(A) *Montipora*

(B) *Acropora*

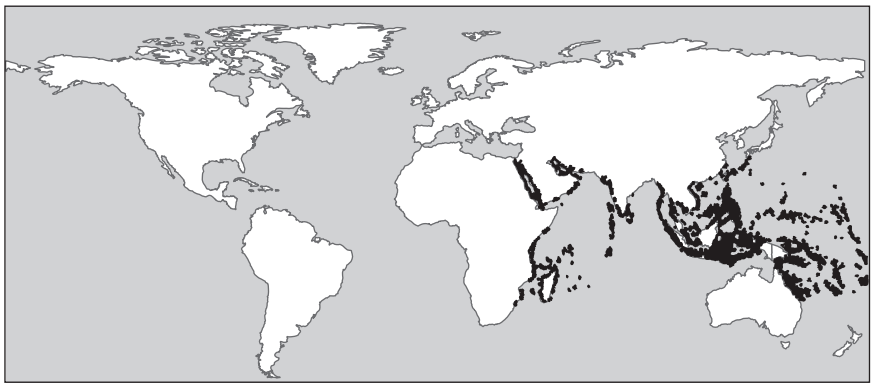
(C) *Isopora*

(D) *Favia*

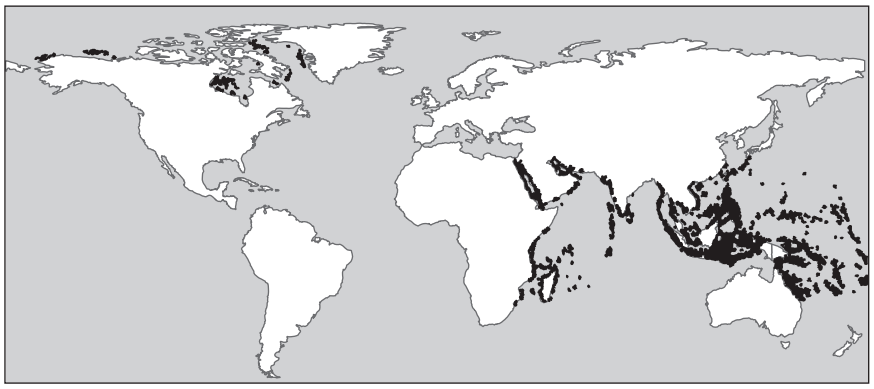
QUESTION 12

Identify the map that shows the global distribution of coral reefs.

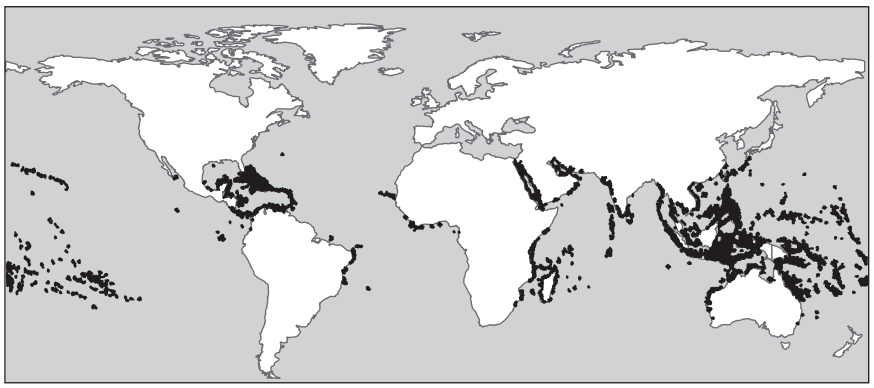
(A)



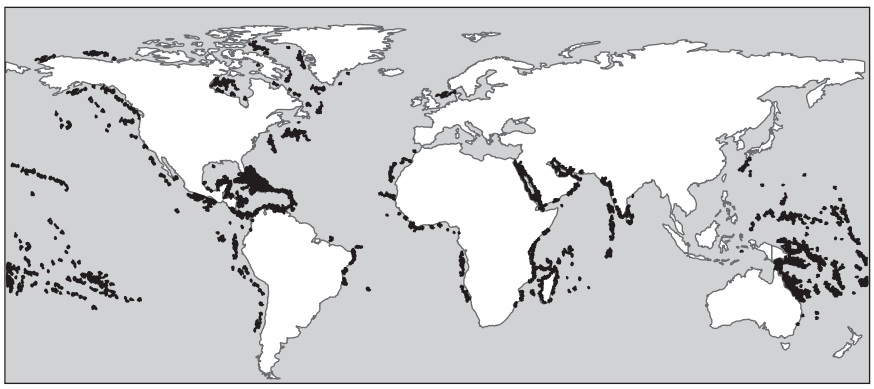
(B)



(C)

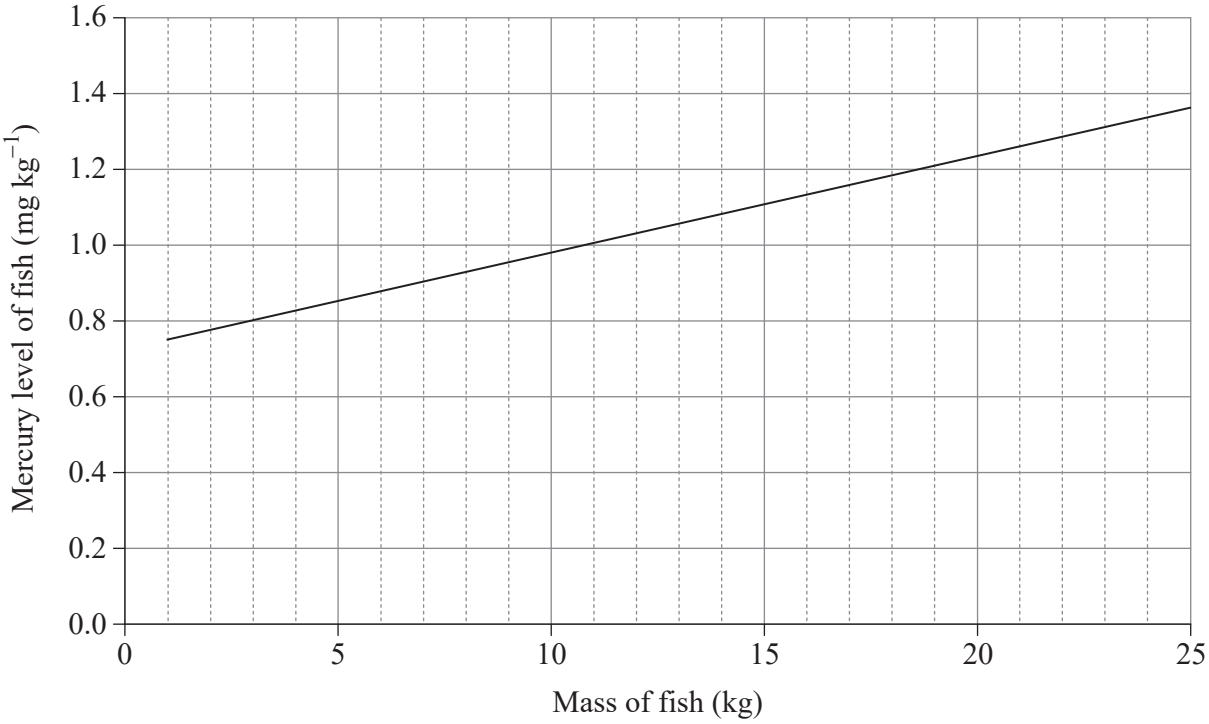


(D)



QUESTIONS 13–14

The graph shows the relationship between mass and mercury level for southern bluefin tuna. Fish processed for human consumption is recommended to contain no more than 1 mg of mercury per kg of fish.



QUESTION 13

Determine the maximum mass of a southern bluefin tuna that could be processed for safe human consumption.

(A) 1 kg

(B) 9 kg

(C) 10 kg

(D) 12 kg

QUESTION 14

Why does the mercury level in southern bluefin tuna increase as the mass of a fish increases?

(A) They are migratory.

(B) Their lifespan is short.

(C) They excrete mercury effectively.

(D) Mercury bioaccumulates in their tissues.

QUESTION 15

The table shows the trend in coral cover for three regions of the Great Barrier Reef (GBR) from 2019 to 2021 and the number of reefs affected by disturbance events in 2022.

			Number of reefs affected by disturbance events in 2022		
Great Barrier Reef region	**Coral cover in 2021 (%)**	**Current trend in coral cover (2019–21)**	**Cyclone event**	**Crown-of-thorns starfish outbreak**	**Bleaching event**
Northern GBR (n = 26)	27	increase	0	1	0
Central GBR (n = 33)	26	increase	0	0	1
Southern GBR (n = 28)	39	increase	0	7	0

Predict the change in coral cover across the Great Barrier Reef regions based on the disturbance events experienced in 2022.

	Northern GBR	**Central GBR**	**Southern GBR**
(A)	increase	increase	increase
(B)	increase	decrease	increase
(C)	increase	increase	decrease
(D)	decrease	increase	decrease

QUESTION 16

One argument for habitat conservation is that the natural landscape is beautiful and can be a source of spiritual connection for people. This argument is

(A) ethical.

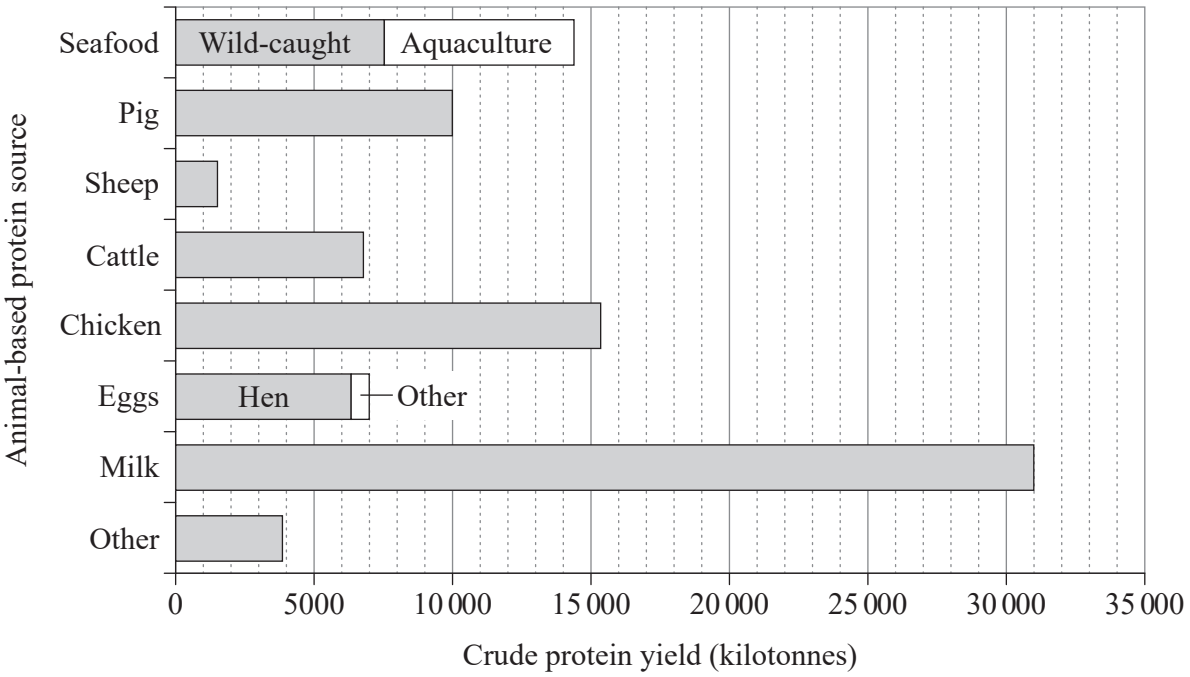
(B) aesthetic.

(C) economic.

(D) ecological.

QUESTION 17

The graph shows the contribution of different animal-based protein sources to global crude protein yield in 2023.



Which option describes the contribution of wild-caught seafood to crude protein yield?

(A) greater than cattle but less than eggs

(B) greater than pig but less than chicken

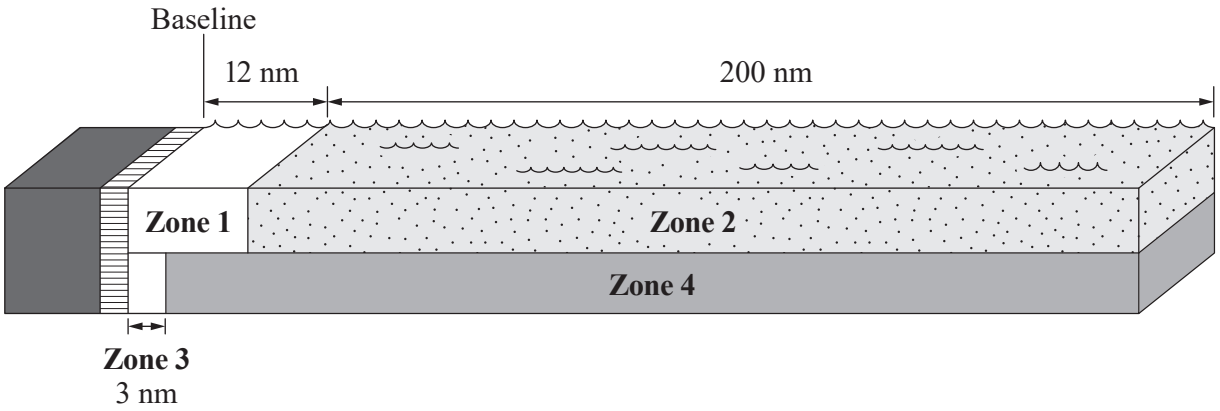
(C) greater than aquaculture but less than pig

(D) greater than eggs but less than aquaculture

QUESTION 18

The figure shows different zones in Australian waters.

Not to scale
nm = nautical miles



Identify zone 4.

(A) Australian fishing zone

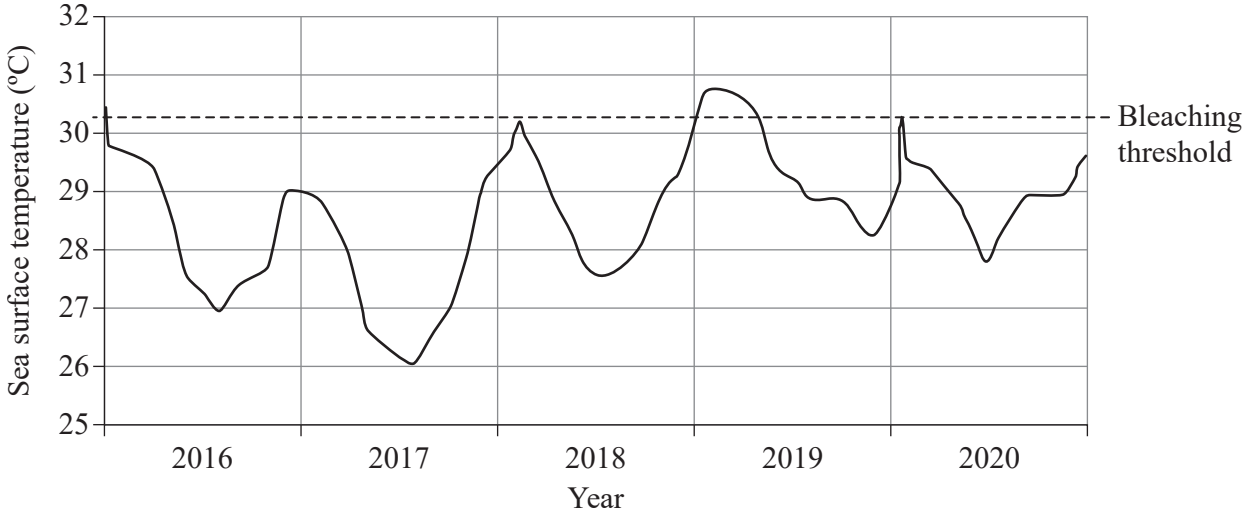
(B) Australian territorial sea

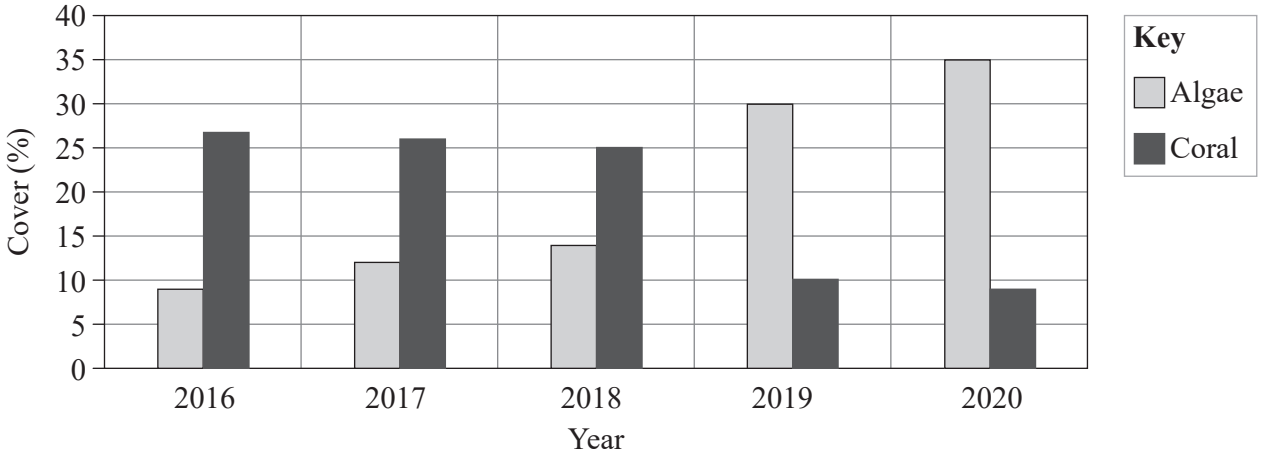
(C) Australian coastal waters

(D) Australian exclusive economic zone

QUESTIONS 19–20

The graphs show the bleaching threshold and sea surface temperature data for a reef between 2016 and 2020, and the corresponding percentage cover for coral and algae.





QUESTION 19

Identify the relationship between algae cover and coral cover.

(A) There is no relationship between algae cover and coral cover.

(B) Algae cover increases as coral cover decreases.

(C) Coral cover decreases as algae cover decreases.

(D) Algae cover increases as coral cover increases.

QUESTION 20

In which year did a coral bleaching event most likely take place?

(A) 2016

(B) 2018

(C) 2019

(D) 2020

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References

Question 11

Adapted from Figure 1 in Fukami, H, Iwao, K, Kumagai, NH, Morita, M & Isomura, N 2019, 'Maternal inheritance of F1 hybrid morphology and colony shape in the coral genus Acropora', *PeerJ*, vol. 7, article e6429, https://doi.org/10.7717/peerj.6429. CC BY 4.0

Question 12

Maps showing location of reef building coral adapted from National Oceanic and Atmospheric Administration (NOAA) image sourced at https://commons.wikimedia.org/wiki/File:Reef_building_corals.jpg.

Question 15

Data sourced from Australian Institute of Marine Science 2022, *Annual Summary Report of Coral Reef Condition* 2021/2022, AIMS, Canberra, www.aims.gov.au/monitoring-great-barrier-reef/gbr-condition-summary-2021-22.

Question 17

Data sourced from Boyd, CE McNevin, AA & David, RP 2022, 'The contribution of fisheries and aquaculture to the global protein supply', *Food Security*, www.ncbi.nlm.nih.gov/pmc/articles/PMC8771179.

Question 18

Figure adapted from Mobsby, D & Curtotti, R 2018, *Snapshot of Australia's Commercial Fisheries and Aquaculture*, ABARES Insights, no. 4, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra, https://doi.org/10.25814/5c10f672bff77. CC BY 4.0