

External assessment 2021

Multiple choice question book

# Marine Science

## Paper 1

### General instruction

- Work in this book will not be marked.



Queensland  
Government



Queensland Curriculum  
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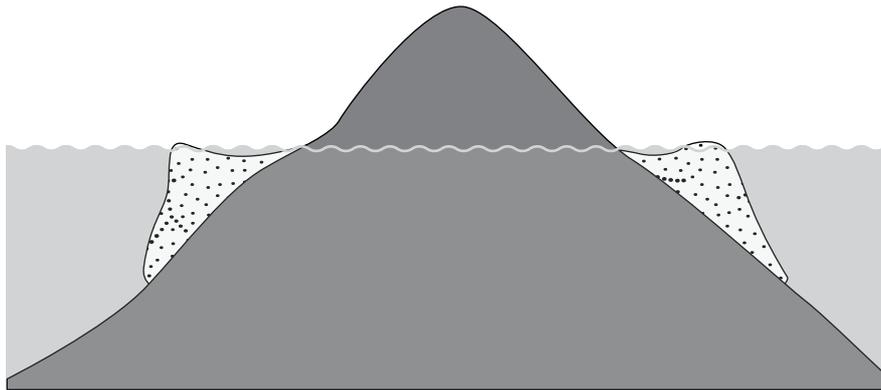
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## Section 1

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### QUESTION 1

Identify the reef structure in the diagram.



- (A) barrier reef
- (B) fringing reef
- (C) platform reef
- (D) ribbon reef

### QUESTION 2

Recent surveys in the Gulf of Carpentaria have shown large-scale mangrove loss. Determine the expected responses from reef fish species that use this habitat during their life cycle.

	Larval recruitment (mangroves)	Juvenile populations (mangroves)	Adult populations (reef)
(A)	Immediately decline	Immediately decline	Initially unaffected then decline over time
(B)	Initially unaffected then decline over time	Initially unaffected then decline over time	Initially unaffected then decline over time
(C)	Initially unaffected then decline over time	Initially unaffected then decline over time	Immediately decline
(D)	Immediately decline	Immediately decline	Immediately decline

### QUESTION 3

The argument to preserve seagrass beds because they contribute to coral reef resilience, sequester carbon, and act as a nursery for many species is

- (A) aesthetic.
- (B) ecological.
- (C) economic.
- (D) ethical.

### QUESTION 4

Which edible seafood product is a major Australian import and export?

- (A) tuna
- (B) prawns
- (C) abalone
- (D) rock lobsters

### QUESTION 5

Which type of fishery is best represented by various small-scale, low technology, low capital fishing practices undertaken by individual households?

- (A) artisanal
- (B) traditional
- (C) commercial
- (D) recreational

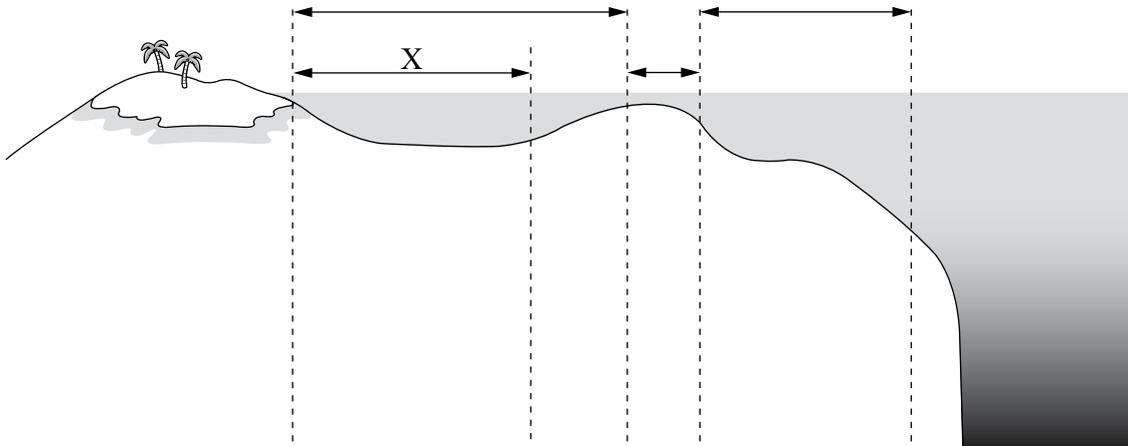
### QUESTION 6

The limestone skeletons of coral are formed when carbonate ions combine with

- (A) sodium ions.
- (B) calcium ions.
- (C) chloride ions.
- (D) hydrogen ions.

### QUESTION 7

Identify the zone labelled X on the figure.



- (A) reef crest
- (B) fore reef
- (C) reef flat
- (D) lagoon

### QUESTION 8

Increases in atmospheric carbon dioxide can influence ocean chemistry by

- (A) decreasing carbonic acid and decreasing pH.
- (B) decreasing carbonic acid and increasing pH.
- (C) increasing carbonic acid and decreasing pH.
- (D) increasing carbonic acid and increasing pH.

### QUESTION 9

The buffering capacity and pH of ocean waters are greater than fresh waters because the concentration of

- (A) hydrogen carbonate ions is greater in fresh waters.
- (B) carbonate ions is greater in ocean waters.
- (C) hydrogen ions is greater in fresh waters.
- (D) sodium ions is greater in ocean waters.

### QUESTION 10

Zooxanthellae are beneficial to corals because they provide

- (A) oxygen and glucose via respiration.
- (B) oxygen and glucose via photosynthesis.
- (C) carbon dioxide and glucose via respiration.
- (D) carbon dioxide and glucose via photosynthesis.

### QUESTION 11

In addition to achieving good water quality, what is necessary for corals to recover from a bleaching event?

	<b>Fisheries</b>	<b>Marine park</b>
(A)	Effective monitoring	Effective monitoring
(B)	Effective monitoring	Effective management
(C)	Effective management	Effective monitoring
(D)	Effective management	Effective management

### QUESTION 12

When compared to maximum sustainable yield, maximum economic yield has

- (A) more effort, lower cost and lower profit.
- (B) less effort, greater cost and lower profit.
- (C) less effort, lower cost and greater profit.
- (D) more effort, greater cost and greater profit.

### QUESTION 13

When applied to the concept of reef resilience, hysteresis is best described as

- (A) a disturbance that impacts reefs by increasing coral biodiversity.
- (B) a critical condition that shifts reefs to a state from which they cannot recover.
- (C) the connection of reefs through movement of water by wind, currents and tides.
- (D) the capacity for reefs to recover from a critical condition by an alternate pathway.

### QUESTION 14

In terms of connectivity, the role of mangrove forests in the management of water quality on the reef is to

- (A) increase water clarity and increase nutrient loads.
- (B) decrease water clarity and increase nutrient loads.
- (C) increase water clarity and decrease nutrient loads.
- (D) decrease water clarity and decrease nutrient loads.

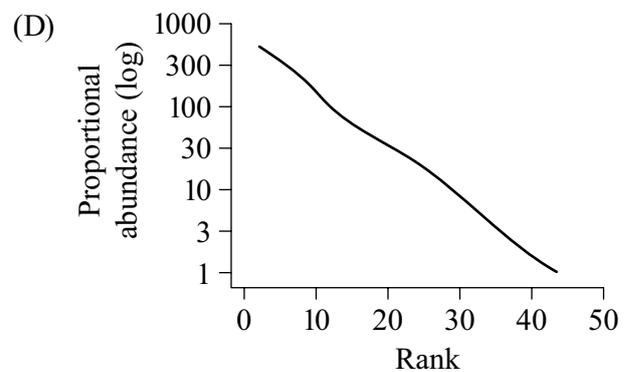
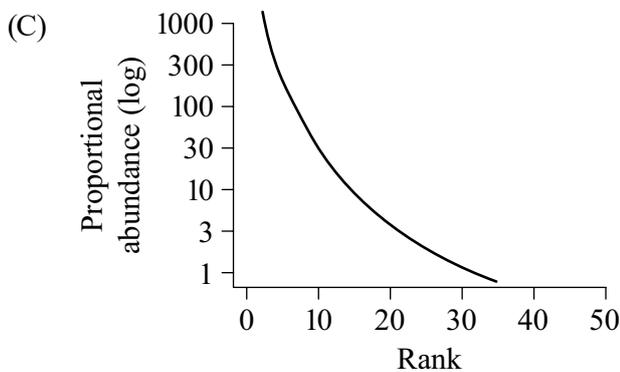
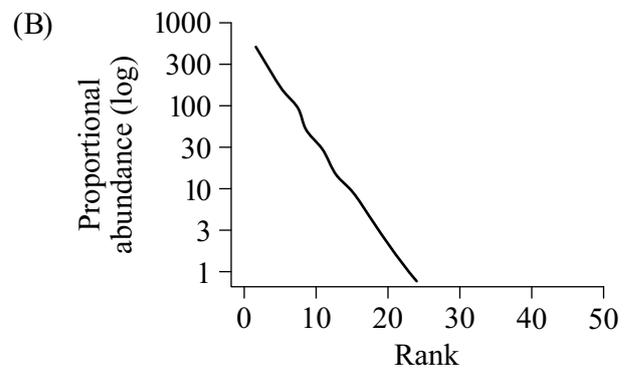
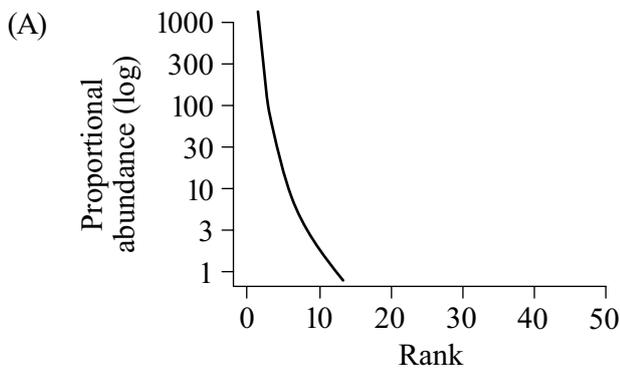
### QUESTION 15

Identify the abiotic factor that has affected the geographical distribution of coral over geological time.

- (A) light availability
- (B) coral spawning period
- (C) mass extinction events
- (D) symbiotic zooxanthellae

### QUESTION 16

Identify the graph that represents the highest species richness with the greatest species evenness.



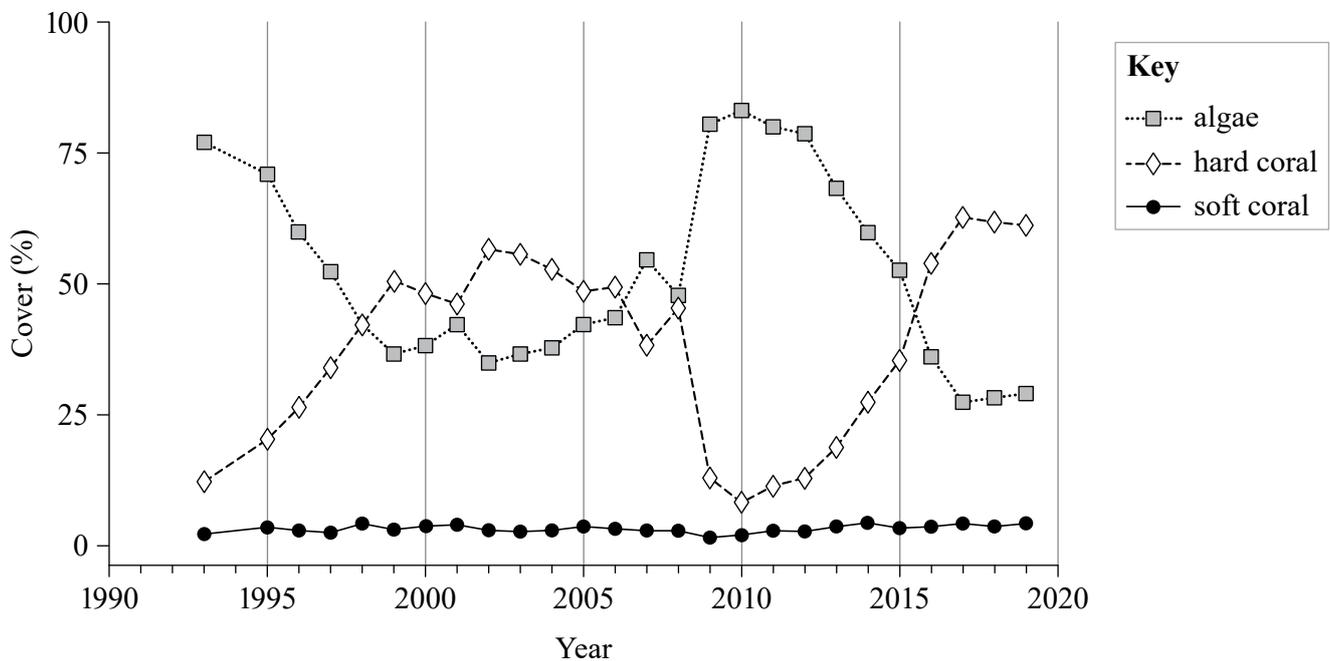
### QUESTION 17

When making a decision that could put an ecosystem at risk, the precautionary principle should be applied when

- (A) the decision may be politically unpopular.
- (B) scientific evidence indicates that damage is unlikely.
- (C) there is insufficient scientific data about the impacts of the decision.
- (D) the potential income offsets any environmental damage that may occur.

### QUESTION 18

This graph shows how algae, hard coral and soft coral cover has changed on a reef over time.



Deduce which year the reef was struck by a cyclone.

- (A) 1995
- (B) 1998
- (C) 2009
- (D) 2015

### QUESTION 19

What is a limitation of using spatial movement to determine fisheries population data?

- (A) It is dynamic and unpredictable.
- (B) It relies on visual census methods.
- (C) It is limited to non-migratory species.
- (D) It is reliant on abiotic factors such as temperature.

### QUESTION 20

Aquaculture production in Queensland				
Year	2014–15		2016–17	
Production	t	\$'000	t	\$'000
Prawns	4951	81 178	4264	77 800
Redclaw	45	1043	65	2700
Barramundi	2931	21 501	2987	28 400
Silver perch	53	626	125	1105

Determine the species that had the greatest increase in value per tonne (t) between 2014 and 2017.

- (A) prawns
- (B) redclaw
- (C) barramundi
- (D) silver perch

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## References

### Question 1

Adapted from Earle, S 2019, *Figure 18.2.4 The formation of a fringing reef, a barrier reef, and an atoll around a subsiding tropical volcanic island* in '18.2 The Geology of the Oceanic Crust', *Physical Geology: 2nd Edition*, available at: <https://opentextbc.ca/physicalgeology2ed/chapter/18-2-the-geology-of-the-oceanic-crust/#fig18.2.4>, Licensed under a Creative Commons Attribution 4.0 International License

### Question 7

Adapted from National Oceanic and Atmospheric Administration 2017, 'How do coral reefs form?', NOS Education, [https://oceanservice.noaa.gov/education/tutorial\\_corals/coral04\\_reefs.html#1](https://oceanservice.noaa.gov/education/tutorial_corals/coral04_reefs.html#1) This U.S. Government material is not subject to copyright protection.

### Question 18

Graph adapted from *Reef Monitoring 2022*, <https://apps.aims.gov.au/reef-monitoring/reef/23051S/manta>.  
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### Question 20

Data sourced from Australian Bureau of Agricultural and Resource Economics and Sciences statistics 2017 (Table S9 – Fisheries and Aquaculture production, Queensland) page 61., [https://www.awe.gov.au/sites/default/files/sitecollectiondocuments/abares/publications/AustFishAquacStats\\_2017\\_v1.2.0.pdf](https://www.awe.gov.au/sites/default/files/sitecollectiondocuments/abares/publications/AustFishAquacStats_2017_v1.2.0.pdf)



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