



**Methodist Ladies' College
Semester 2 Sample Examination**

Question/Answer Booklet

**MARINE AND MARITIME STUDIES
ATAR Year 11**

Student Name: _____

Teacher Name: _____

Time allowed for this paper

Reading time before commencing work: ten minutes

Working time for paper: three hours

Materials required/recommended for this paper

To be provided by the supervisor

This Question/Answer Booklet

Multiple-choice Answer Sheet

A3 excerpt taken from Rottnest Island chart (WA412)

Portland Square and a piece of string.

To be provided by the candidate

Standard items: pens (blue/black preferred), pencils (including coloured),
sharpeners, correction fluid/tape, eraser, ruler, highlighters

Special items: non-programmable calculators approved for use in the WACE
examinations;

Important note to candidates

No other items may be taken into the examination room. It is **your** responsibility to ensure that you do not have any unauthorised notes or other items of a non-personal nature in the examination room. If you have any unauthorised material with you, hand it to the supervisor **before** reading any further.

Structure of this paper

| Section | Number of questions available | Number of questions to be answered | Suggested working time (minutes) | Marks available | Percentage of total exam | Your mark |
|--------------------------------|-------------------------------|------------------------------------|----------------------------------|-----------------|--------------------------|-----------|
| Section One: Multiple-choice | 20 | 20 | 30 | 20 | 20 | |
| Section Two: Short answer | 6 | 6 | 100 | 90 | 50 | |
| Section Three: Extended answer | 4 | 2 | 50 | 40 | 30 | |
| Total | | | | | 100 | |

Instructions to candidates

- a. The rules for the conduct of ATAR course examinations are detailed in the Year 11 Course Handbook. Sitting this examination implies that you agree to abide by these rules.

- a. Answer the questions according to the following instructions.

Section One: Answer **all** questions on the separate Multiple-choice Answer Sheet provided. For each question, shade the box to indicate your answer. Use only a blue or black pen to shade the boxes. If you make a mistake, place a cross through the square, then shade your new answer. Do not erase or use correction fluid/tape. Marks will not be deducted for incorrect answer. No marks will be given if more than one answer is completed for any question.

Sections Two and Three: Write your answers in this Question/Answer Booklet.

- b. You must be careful to confine your responses to the specific questions asked and to follow any instruction that are specific to a particular questions.
- c. Spare pages are included at the end of this booklet. They can be used for planning your responses and/or as additional space if required to continue an answer.
- Planning: If you use the spare pages for planning, indicate this clearly at the top of the page.
 - Continuing an answer: If you need to use the space to continue an answer, indicate in the original answer space where the answer is continued, i.e. give the page number. Fill in the number of the questions that you are continuing to answer at the top of the page.

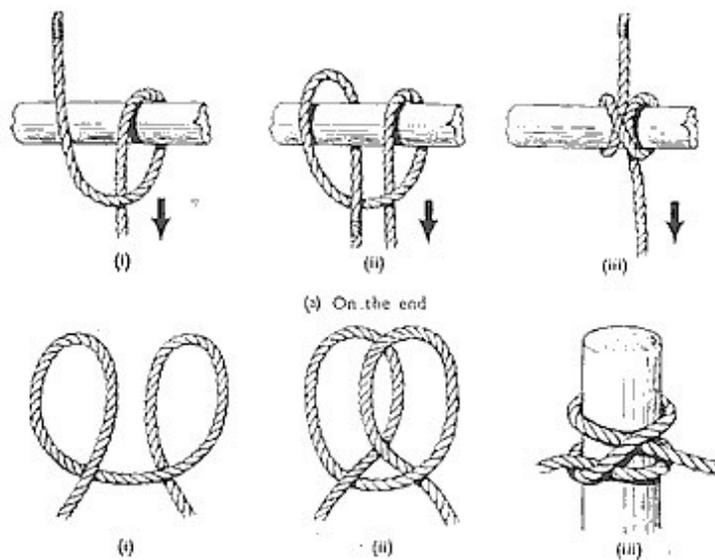
Section One: Multiple-choice

20% (20 marks)

This section has 20 questions. Answer **all** questions on the separate Multiple-choice Answer Sheet provided. For each question, shade the box to indicate your answer. Use only a blue or black pen to shade the boxes. If you make a mistake, place a cross through that square, then shade your new answer. Do not erase or use correction fluid/tape. Marks will not be deducted for incorrect answers. No marks will be given if more than one answer is completed for any question.

Suggested working time: 30 minutes.

1. The diagram below illustrates a number of steps taken to tie a particular knot.



The knot that is being tied is called a:

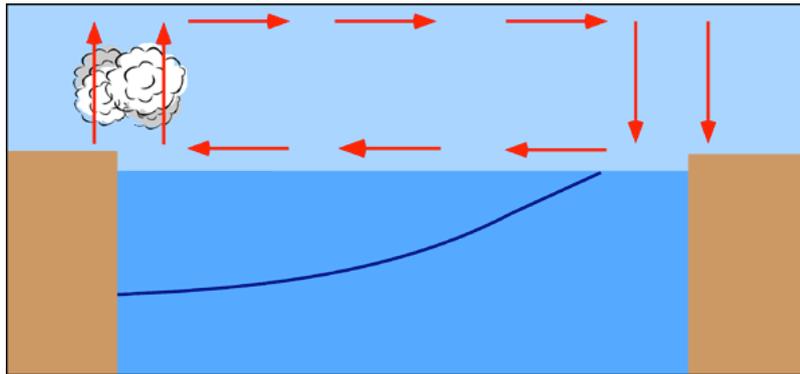
- a. clove hitch
- b. reef knot
- c. round turn, 2 and a half hitches
- d. sheet bend

2. The marine organism pictured on the right belongs to which Phylum?

- a. Porifera
- b. Cnidaria
- c. Mollusca
- d. Chordata

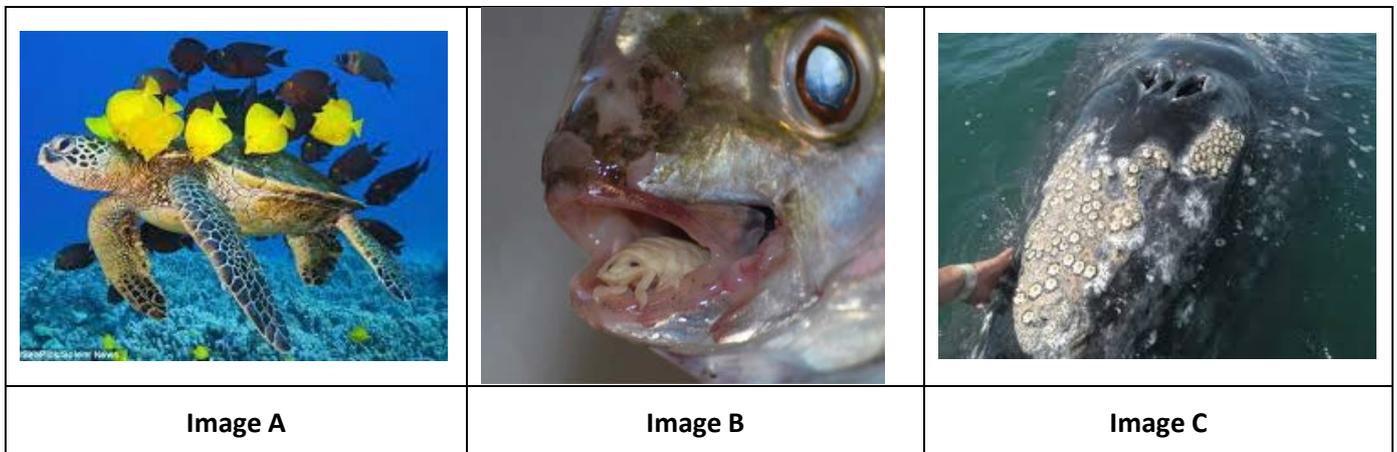


3. The following diagram illustrates which phase of the El Niño-Southern Oscillation (ENSO) cycle?



- a. El Niño
- b. Walker circulation
- c. Pacific inflow
- d. La Niña

4. Three different interrelationships are shown below by Images A, B and C.



Which of the following options correctly describes the interrelationships shown by Images A - C?

- | | | |
|--|--|---|
| <p>Image A</p> <ul style="list-style-type: none"> a. mutualism b. commensalism c. commensalism d. mutualism | <p>Image B</p> <ul style="list-style-type: none"> a. predator-prey b. parasite-host c. predator-prey d. parasite-host | <p>Image C</p> <ul style="list-style-type: none"> a. parasite-host b. mutualism c. mutualism d. commensalism |
|--|--|---|

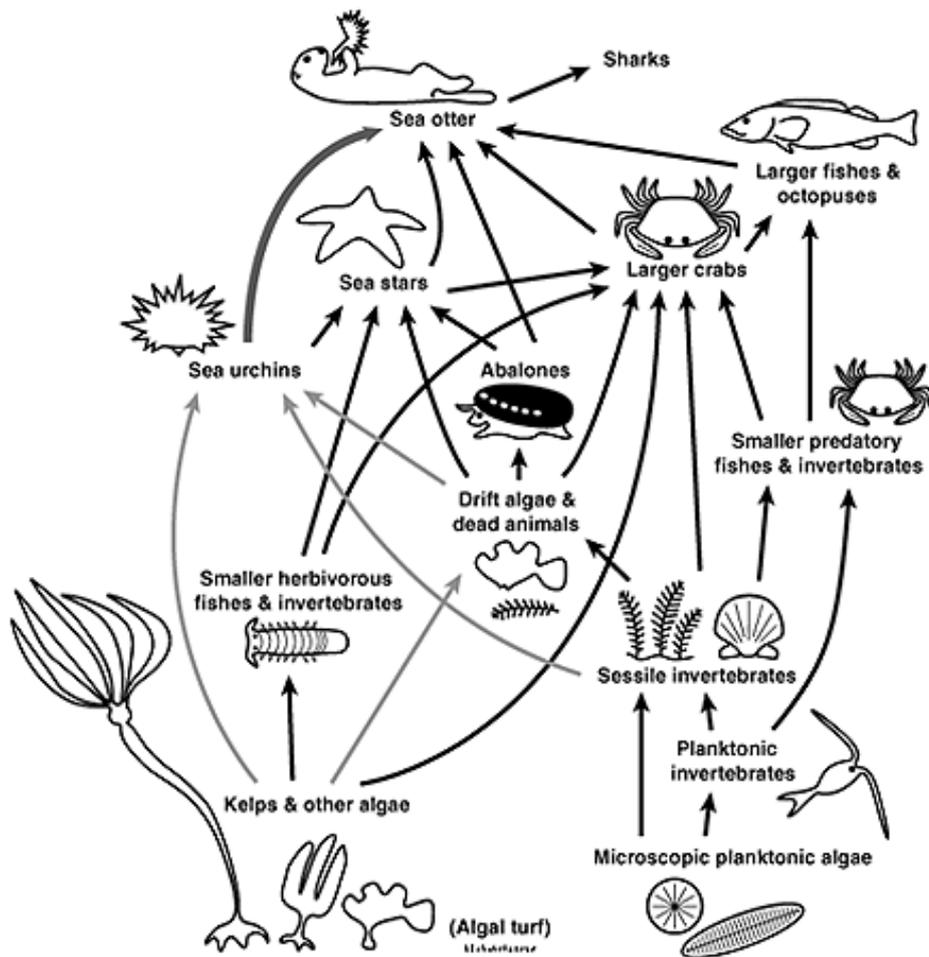
5. Which phyla of organisms possess the characteristics stated below?

'Unsegmented soft body with bilateral symmetry. Presence of an internal or external shell. A toothed tongue called the radula. A mantle that lines the shell.'

- a. Annelida
- b. Mollusca
- c. Cnidaria
- d. Echinodermata

See next page

The next three questions are based on information shown in the food web below.



6. In the above food web, larger crabs are considered to be:
 - a. Detritivores
 - b. Top predators
 - c. Higher order consumers
 - d. Herbivores

7. What is the ultimate source of energy for this food web?
 - a. Drift algae and dead animals
 - b. Microscopic planktonic algae
 - c. Kelps and other algae
 - d. The Sun

8. If the sea stars contracted a deadly virus which decimated the population, what effect would this have on the remaining species in the above food web?
 - a. Sea otter population would decline due to the lack of suitable food sources.
 - b. Abalone population would decline due to increased competition
 - c. The populations of smaller herbivorous fishes and invertebrates would increase due to lack of predation
 - d. The numbers of drift algae and dead animals would increase due to lack of predation by the sea stars and sea urchins.

See next page

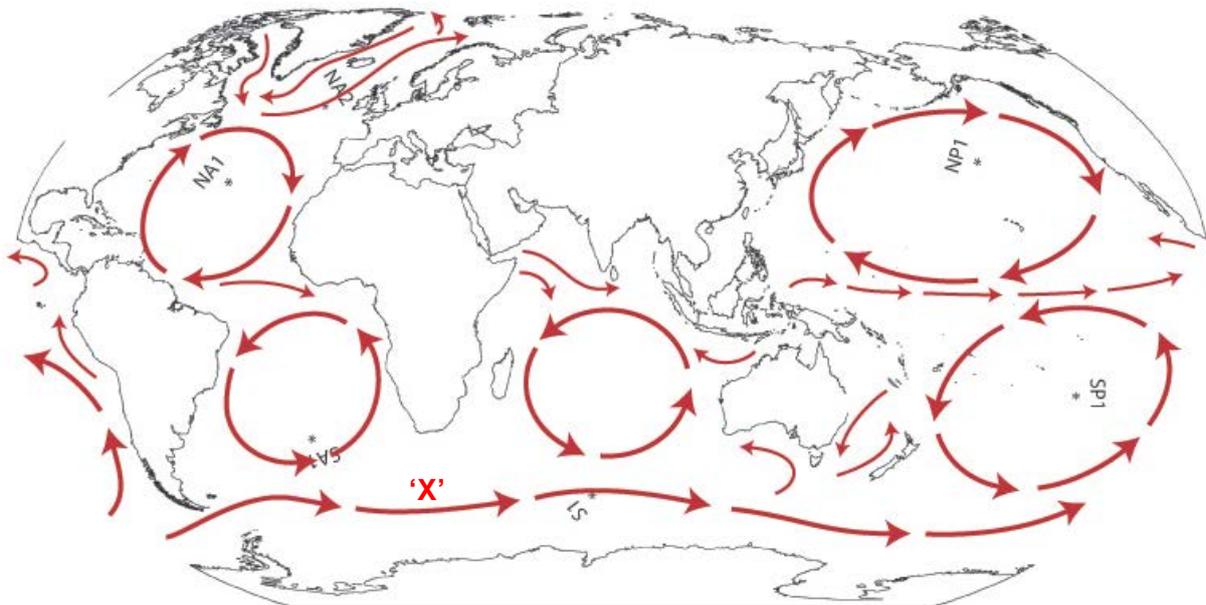
9. The following table shows the predicted tidal heights for Broome today.

| Time | Height (m) |
|--------|------------|
| 1:30am | 4.5m |
| 7:30am | 6.5m |
| 2pm | 3.9m |
| 8:30pm | 7.2m |

If the tidal range is 6m, what depth of water would you expect to be present at 9:30am?

- a. 4.5m
- b. 5m
- c. 5.5m
- d. 5.8m

10. The map below shows many of the world's major surface ocean currents.



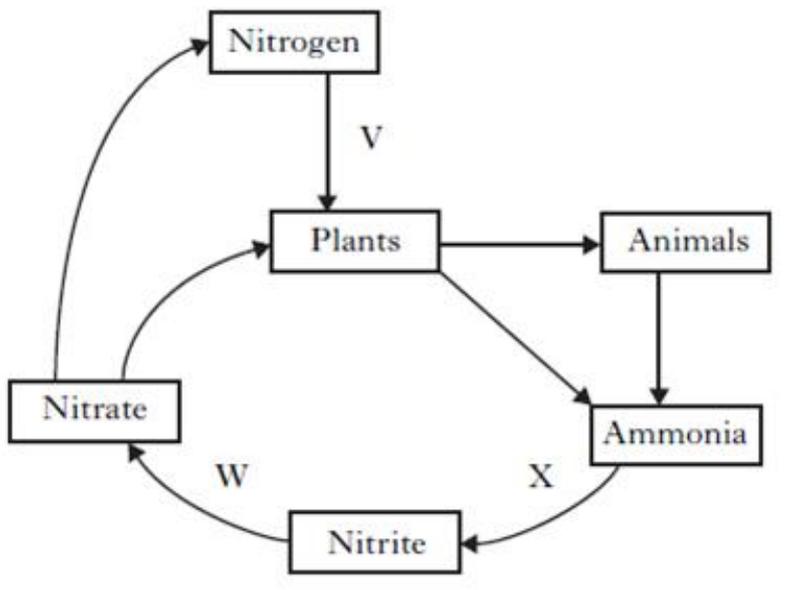
The surface ocean current identified by the letter 'X' is called the:

- a. Antarctic inflow current
- b. Roaring 40s current
- c. Antarctic circumpolar current
- d. Antarctic subpolar current.

11. The physical separation process used to obtain salt from seawater is:

- a. Distillation.
- b. Evaporation.
- c. Filtration.
- d. Sedimentation.

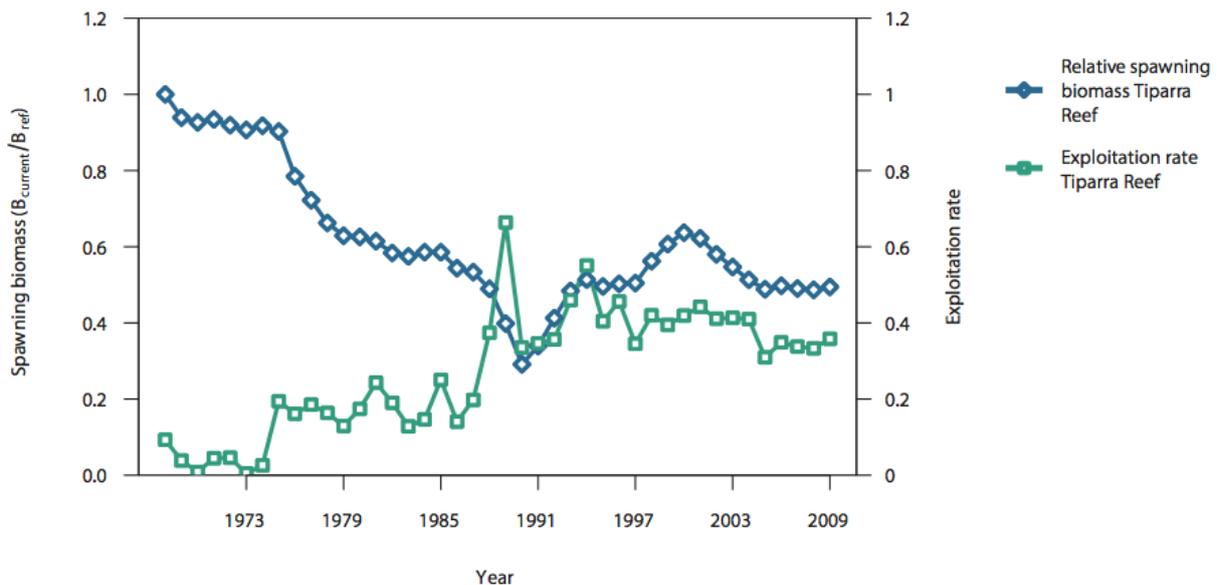
12. Consider the following diagram of the Nitrogen cycle.



The process represented by the letter 'V' is:

- a. Assimilation.
- b. Nitrogen-fixing.
- c. Ammonification.
- d. Denitrification.

13. Consider the following graph which illustrates the relative spawning biomass of Greenlip abalone at Tiparra Reef (in South Australia) in relation to the fishing effort (exploitation rate).



Based on the information presented above, it is reasonable to conclude that in 2009, the Greenlip abalone stocks in this location are:

- a. sustainable.
- b. at risk.
- c. increasing.
- d. overfished.

See next page

14. Which of the following is NOT necessary for the formation of petroleum?

- a. High temperature
- b. High pressure
- c. Dead remains of marine organisms
- d. Dead remains of land plants

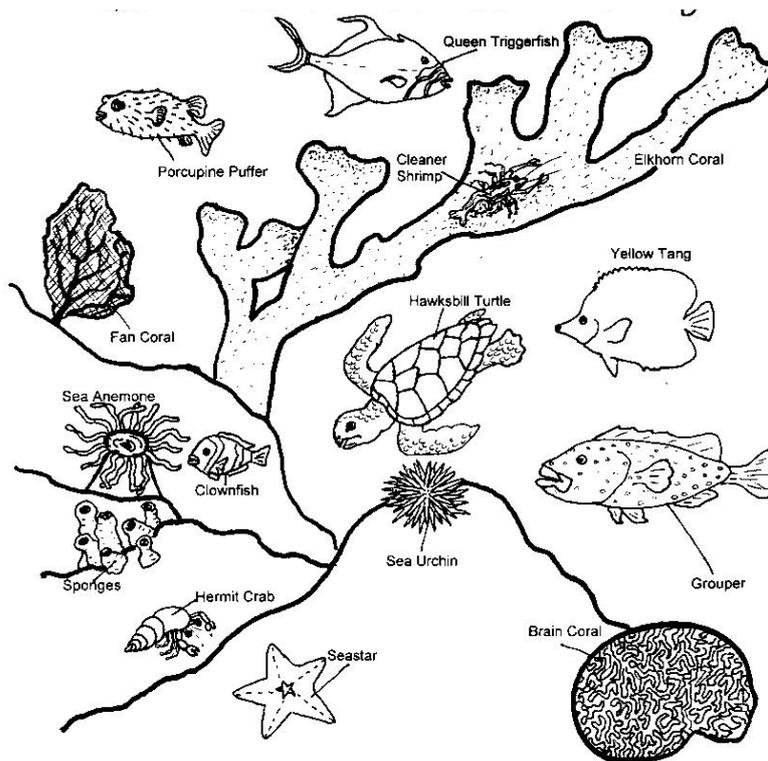
15. Which piece of equipment would you use to accurately measure limpet species diversity on a temperate rock platform?

- a. Quadrat
- b. Transect line
- c. Specimen net
- d. Ruler



Limpet

16. The marine ecosystem shown in the picture below is most likely an example of a:



- a. temperate rocky reef.
- b. coastal lagoon.
- c. seagrass meadow.
- d. coral reef.

See next page

17. What type of aquaculture production system would be best suited to rearing pearl oysters?

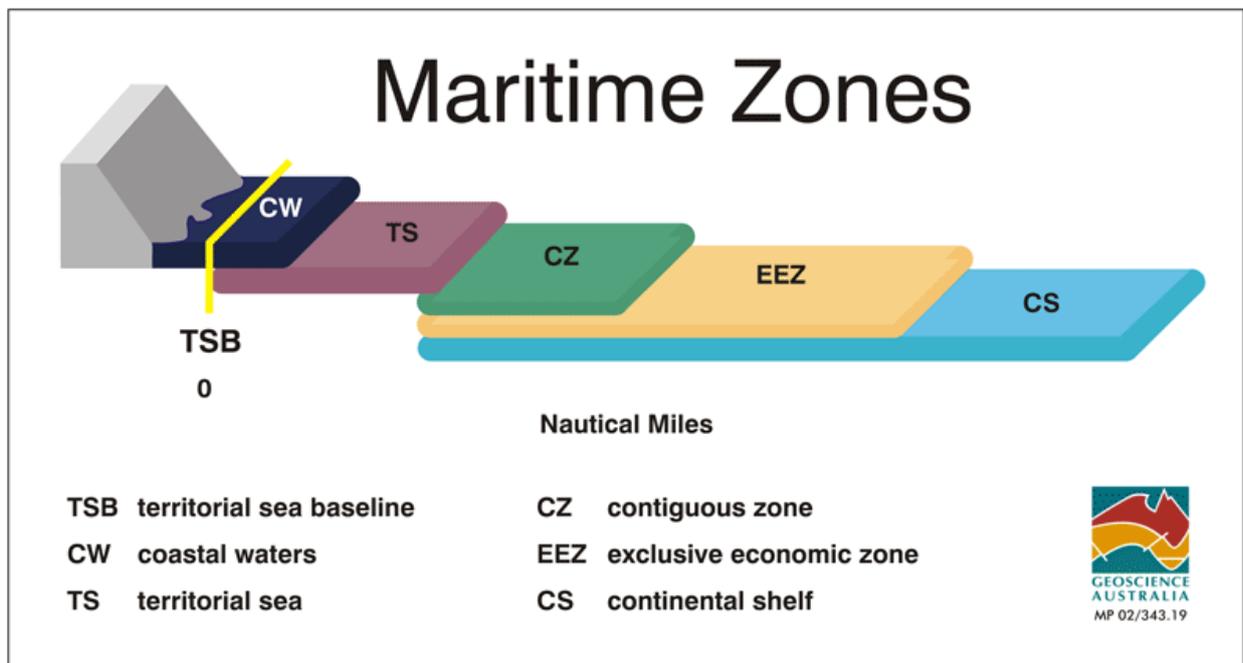
- a. racks
- b. subsurface line culture
- c. ponds
- d. sea ranching

18. You are currently fishing 14 nautical miles from the marina and the maximum speed that your vessel can accelerate to is 10 knots.

What is the latest time that you can leave your position to reach the marina before it gets dark at 7pm?

- a. 4:30pm
- b. 5pm
- c. 5:30pm
- d. 6pm

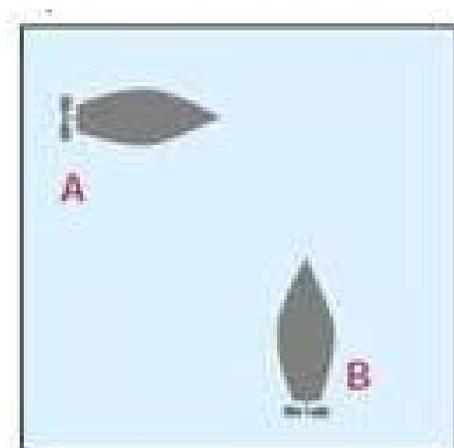
19. The diagram below shows the maritime boundary zones that make up Australia’s Exclusive Economic Zone.



The correct distances (in nautical miles) for each of the maritime boundaries are:

| | Coastal Waters | Territorial Seas | Contiguous Zone | Exclusive Economic Zone |
|----|----------------|------------------|-----------------|-------------------------|
| a. | 2 | 12 | 20 | 200 |
| b. | 2 | 10 | 20 | 320 |
| c. | 3 | 10 | 24 | 200 |
| d. | 3 | 12 | 24 | 320 |

20. The diagram below shows two vessels, Vessel 'A' and Vessel 'B', who are both underway at similar speeds.



Which one of the following actions would avoid a collision between the two vessels?

- Vessel 'A' needs to turn towards their starboard side, Vessel 'B' can maintain their course and speed.
- Vessel 'A' can maintain their course and speed, Vessel 'B' needs to turn towards their port side.
- Both vessels need to reduce their speed and turn to their port sides.
- Vessel 'A' can maintain their course and speed, Vessel 'B' needs to turn towards their starboard side.

End of Section One

See next page

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See next page

Section Two: Short answer

50% (90 marks)

This section has **6** questions. Answer **all** questions. Write your answers in the spaces provided.

Spare pages are included at the end of this booklet. They can be used for planning your responses and/or as additional space if required to continue an answer.

- Planning: If you use the spare page for planning, indicate this clearly at the top of the page.
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Suggested working time: 100 minutes.

Question 21

18 marks

- a. Sailing a vessel to the East Indies was not an easy task in the 1600s. The original route that the Dutch used was based on the voyages of Portuguese explorers nearly a century before.

Describe three disadvantages of this original Portuguese trade route.

3 marks

- b. In 1611, a Dutch explorer investigated the possibility of an alternative route from Cape of Good Hope to the Dutch East Indies. This new trade route quickly became the preferred route by the VOC.

Give the name this new route and explain why it became the preferred route for the VOC.

4 marks

c.

i. Who was the first European to land on West Australian soil?

1 mark

ii. Give three historical implications of this landing.

3 marks

d. Complete the table below which highlights details from one of the Dutch East Indiamen shipwrecks that you have studied this year.

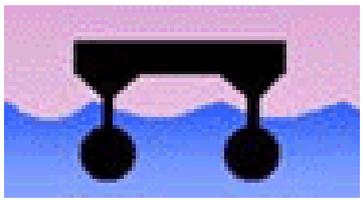
| | |
|---|--|
| In which year was the <i>Zuytdorp</i> wrecked? | |
| What is the location of the <i>Zuytdorp</i> wreck site? | |
| Describe the series of events that led to the <i>Zuytdorp</i> becoming shipwrecked. | |
| What evidence suggests that there were survivors from the <i>Zuytdorp</i> wreck? | |
| Who was responsible for discovering the <i>Zuytdorp</i> wreck site? | |
| In which year was the <i>Zuytdorp</i> wreck site discovered? | |
| How is the <i>Zuytdorp</i> wreck site protected today? | |

7 marks

Question 22

11 marks

a. Name the hulls types shown in the table below.

| | | |
|---|---|---|
|  |  |  |
| | | |

3 marks

b. What is the difference between a displacement hull and a planing hull?

2 marks

c. Using the table below, give one advantage and one disadvantage for each of the commonly used boat building materials listed.

| Building material | Advantage | Disadvantage |
|--------------------------|------------------|---------------------|
| Timber | | |
| Fibreglass | | |
| Aluminium | | |

6 marks

Question 23

10 marks

Use the chart provided (Rottneest Island WA412) to answer the following questions. Please clearly write your name on the chart.

- a. Calculate the chart variation for 2016.

2 marks

- b. Locate positions 'A' and 'B' on the chart.

- i. State the true bearing that you would use to travel from 'A' to 'B'.

1 mark

- ii. Convert this bearing to one that you would use with your compass.

2 marks

- iii. In nautical miles, how far apart is position 'A' from position 'B'?

2 marks

- iv. How many minutes would it take to travel from position 'A' to position 'B' if your vessel was maintaining a speed of 4 knots?

2 marks

- v. According to the chart, what is the depth of water at position 'B'?

1 mark

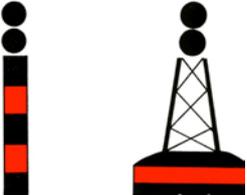
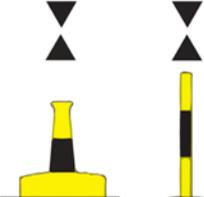
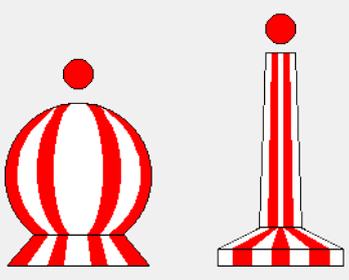
Question 24

24 marks

- a. Describe the steps that you would take (as the Skipper) to bring your vessel alongside a jetty and to secure it safely.

4 marks

- b. Complete the table below, which compares IALA buoyage markers.

| Picture | Name | Light sequence | Information the buoy/marker provides |
|---|------|---|--------------------------------------|
|  | | <p>White light, flashing in a group of 2.</p> | |
|  | | <p>White light, flashing in a group of 9.</p> | |
|  | | <p>White light, occulting sequence</p> | |

6 marks

- c. List the information that a Skipper should include when delivering a safety brief to the crew, prior to departure.

4 marks

- d. You decide to take a day trip 2 nautical miles from the mainland shore onboard a 10m vessel that is fitted with an inboard motor.

Name four pieces of safety equipment that you are legally required to carry on this voyage.

4 marks

- e. Explain how satellite technologies enable the accurate estimation of position fixing.

3 marks

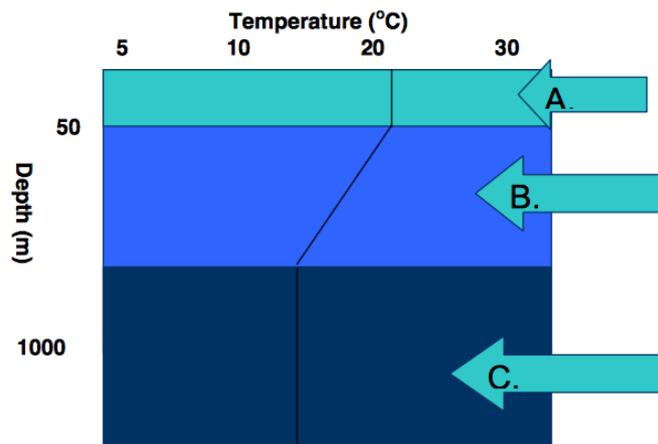
- f. If a damaged vessel deployed an emergency beacon in the Southern Ocean, would Australian authorities be required to offer assistance? Explain your answer.

3 marks

Question 25

14 marks

- a. Consider the following diagram that illustrates layers in the ocean with respect to temperature and depth.



- i. Explain the difference in seawater properties between layer 'A' and layer 'C'.

4 marks

- ii. Name a type of ecosystem that would exist in layer 'C' and give two abiotic factors (aside from temperature) that would determine the diversity of species that inhabit the region.

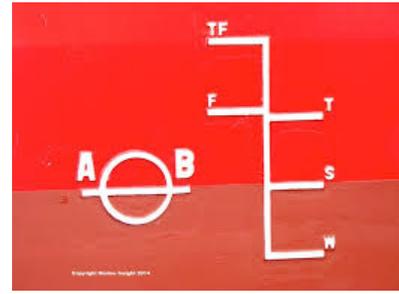
3 marks

- b. 'Oceans cool slower than the land due to the high heat capacity of water'.

Explain this statement.

2 marks

- c.
 - i. The specific set of symbols shown below are found on the gunwales of commercial vessels, near the water line.



What name is given to this set of symbols? _____ 1 mark

- ii. Explain why it is important for commercial vessels to consider this set of symbols when carrying cargo from one port to another.

4 marks

Question 26

13 marks

- a. Give two ways in which seagrass differs to algae.

2 marks

- b. Name two abiotic conditions that are needed for a seagrass meadow to establish and grow.

2 marks

- c. Aside from fish, give two examples of organisms that are likely to inhabit a seagrass meadow. For each example, state the phylum to which this organism belongs.

4 marks

- d. There is an extensive seagrass meadow south of Perth in Cockburn Sound. Between October and December every year, adult Pink Snapper fish aggregate to spawn in Cockburn Sound. The eggs and larvae are kept in the Sound by localised currents.

Explain how the seagrass meadow in Cockburn Sound assists with juvenile development and recruitment of individuals into the Pink Snapper population.

3 marks

- e. While the adult Pink Snapper are spawning in Cockburn Sound, the fishery is closed to recreational and commercial fishers.

Explain how this management decision will help the Pink Snapper stocks in the West Coast Bioregion to recover from historical overfishing.

2 marks

End of Section Two

See next page

Section Three: Extended answer

30% (40 marks)

This section contains **four (4)** questions. You must answer **two (2)** questions. Write your answers on the lined pages provided following Question 30.

Spare pages are included at the end of this booklet. They can be used for planning your responses and/or as additional space if required to continue an answer.

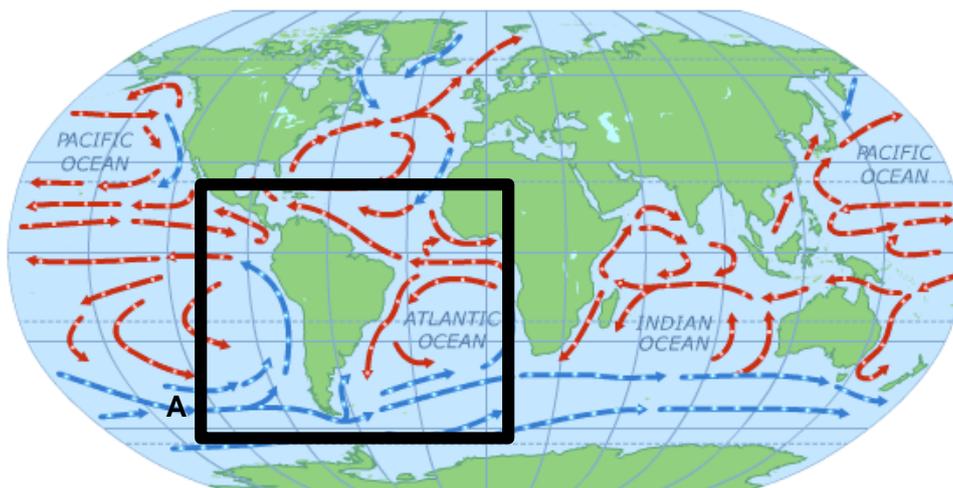
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- Continuing an answer: If you need to use the space to continue an answer, indicate in the original answer space where the answer is continued, i.e. give the page number. Fill in the number of the question that you are continuing to answer at the top of the page.

Suggested working time: 50 minutes.

Question 27

20 marks

- Define the term 'thermohaline circulation'. 2 marks
- Describe how different mechanisms can establish and drive surface and deep-water currents. 4 marks
- Consider the area bounded the black box 'A' below.



Explain two differences that are evident when comparing eastern boundary currents with western boundary currents.

4 marks

- Explain how the Leeuwin current is formed and give two key differences between the Leeuwin current and other western boundary currents. 6 marks
- With reference to the populations of a particular marine animal, explain how the Leeuwin current benefits their survival. 4 marks

See next page

Question 28**20 marks**

The Australian Department of Agriculture and Water Resources is providing money and assistance to businesses and individuals to help establish aquaculture operations in Australia.

Imagine that you would like to set up a fin-fish rearing facility in Western Australia and need to apply for government assistance. Write a proposal that addresses the following points.

- a. Explain why you would consider Western Australia as an ideal location for your aquaculture operation.
4 marks
- b. Give a location in Western Australia that you would choose to setup your operation. Explain your answer.
4 marks
- c. Name the production system that would be most suitable to culture your chosen fish species and give three advantages of this system.
4 marks
- d. Describe the environmental impact that your aquaculture facility could have on the local environment.
6 marks
- e. Give two ways to reduce the impact that aquaculture has on native fish populations.
2 marks

Question 29**20 marks**

- a. Describe three types of historical information that can be uncovered by studying a shipwreck such as the *Zuytdorp* or *Vergulde Draeck*.
6 marks
- b. Explain why it is necessary to protect wreck sites and name the piece of legislation that protects all shipwrecks located in Australian waters.
4 marks
- c. Compare and contrast the navigation methods that were used by Dutch explorers in the 1600s with that of modern-day merchant sailors.
10 marks

See next page

Question 30

20 marks

Use the chart provided (Rottnest Island WA412) to answer the following questions. Please clearly write your name on the chart.

a. Give the latitude and longitude for the following locations:

- i. Lower lead marker at Armstrong Point
- ii. City of York wreck

4 marks

b. North of Point Clune there is a marker with a flashing light sequence of **FL R 3s 2M**.

What information does this sequence provide for navigators?

2 marks

c. You decide to go for a day trip from Geordie Bay in your 3m centre console. You would like to anchor in the 3.2m section of water north of Ricey Beach.

i. Plot your voyage in pencil on the chart provided

4 marks

ii. Calculate the distance that your vessel has travelled in nautical miles.

3 marks

iii. If you were travelling at 8 knots for the whole distance, calculate how many minutes it would take to travel from Geordie Bay to Ricey Beach.

3 marks

d. The table below left shows the predicted tide levels at Rottnest for today.

| Time | m |
|------|-----|
| 0300 | 0.5 |
| 0900 | 1.1 |
| 1500 | 0.4 |
| 2130 | 1.2 |

i. Calculate the tide level that is expected at midday today, given a tidal range of 1m.

3 marks

ii. Calculate the depth of water under your vessel when anchored in the 3.2m section of water north of Ricey Beach at midday.

1 mark

End of questions

See next page

