Government of **Western Australia**
School Curriculum and Standards Authority

WACE
Western Australian Certificate of Education

Western Australian Certificate of Education Examination, 2013

Question/Answer Booklet

MARINE AND MARITIME STUDIES

Stage 3

Please place your student identification label in this box

Student Number: In figures | | | | | | | | | |

In words _____

_____

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

Number of additional answer booklets used (if applicable): ☐

To be provided by the candidate

Standard items: pens (blue/black preferred), pencils (including coloured), sharpener, 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.

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Web version of 2013/43481

Ref: 13-074

Structure of this paper

Section	Number of questions available	Number of questions to be answered	Suggested working time (minutes)	Marks available	Percentage of exam
Section One: Multiple-choice	20	20	20	20	20
Section Two: Short answer	6	6	90	70	50
Section Three: Extended answer	4	2	70	50	30
				Total	100

Instructions to candidates

1. The rules for the conduct of Western Australian external examinations are detailed in the *Year 12 Information Handbook 2013*. Sitting this examination implies that you agree to abide by these rules.

2. 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 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.

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

3. You must be careful to confine your responses to the specific questions asked and to follow any instructions that are specific to a particular question.

4. 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 question that you are continuing to answer at the top of the page.

See next 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: 20 minutes.

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1. You are snorkelling with a group of people and one of the divers performs the hand signal shown in the diagram on the right.

   What does this hand signal indicate?

   (a) stop
   (b) swim this way
   (c) danger
   (d) hold my hand

2. Which of the following **best** exemplifies an hypothesis?

   (a) If the seawater temperature rises, coral bleaching will occur.
   (b) Seawater temperature affects coral bleaching.
   (c) Coral bleaching is caused by an increase in seawater temperature.
   (d) An increase in seawater temperature causes the coral polyp to expel the zooxanthellae.

3. A snorkeller was found to have a volume of 65 L and a mass of 70 kg, when weighed in air on a set of bathroom scales. He gained one kilogram when he put on his wetsuit and displaced 74 L of seawater when submerged.

   Assuming the density of seawater is 1 kg/L, how much weight would he need to wear on his weight belt to make him neutrally buoyant?

   (a) 6 kg
   (b) 3 kg
   (c) 9 kg
   (d) 1 kg

4. Which of the following methods could be used to locate a shipwreck?

   (a) divers swimming over an unnatural seascape and recognising that it could be a shipwreck
   (b) researching old newspaper articles, archives and books about shipwrecks
   (c) using a magnetometer to locate ferrous objects that could be from a shipwreck
   (d) any or all of the above methods

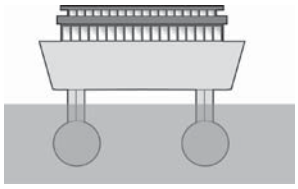
See next page

5. Which of the following is the **best** option for equalising the air pressure in your ears?

(a) closing your mouth, pinching your nose and sucking through your nose
(b) breathing out slowly through your mouth as you ascend
(c) closing your mouth, pinching your nose and blowing gently
(d) pulling your ears and blowing gently through your nose

6. The hull design shown in the diagram below is an example of a

(a) trimaran.
(b) catamaran.
(c) SWATH.
(d) wave piercer.



7. If the volume in a snorkeller's lungs is 4 L at the surface and she dives to a depth of 15 m, what will be the volume of her lungs at 15 m?

(a) 1.6 L
(b) 10 L
(c) 4 L
(d) 2 L

8. Which one of the following methods of data collection would most accurately measure the diversity and abundance of fish populations along a reef?

(a) While snorkelling, record on an underwater slate the number and types of fish seen.
(b) Along a set baseline, record the number and types of fish seen within a series of quadrat squares.
(c) Randomly place quadrat squares along a reef and record on an underwater slate the number and types of fish seen within them.
(d) Use a glass-bottom bucket from a boat to view the fish and call out the number and types of fish seen to a recorder to tabulate.

9. What makes the design of a commercial fishing boat different from that of a yacht?

(a) The hull of a commercial fishing boat is made of aluminium whereas a yacht hull is made of fibreglass.
(b) A commercial fishing boat has one hull whereas a yacht can be mono-hulled or multi-hulled.
(c) A commercial fishing boat must be over 25 m in length but a yacht is less than 10 m in length.
(d) The shape of the hull of a commercial fishing boat emphasises stability over speed, unlike that of a yacht.

See next page

10. Which of the following techniques describes **most** accurately the key element in clearing your snorkel using the displacement method?

(a) Upon resurfacing, take your tongue out of the mouthpiece and blow air into the snorkel, thus displacing any water filling it.
(b) Trap air in your snorkel, so that as you resurface, air displaces the water that fills the snorkel.
(c) As you resurface, keep your chin on your chest and let the water in the snorkel be displaced by the air that you are breathing out slowly.
(d) Swim slowly to the surface to allow enough time for the water to displace the air that you have breathed slowly into the snorkel.

11. A large oil spill has occurred in shallow waters 4 km from the coast of Western Australia. The spill is likely to come ashore. Which is the best method of managing such a spill?

(a) Wait for currents and wave action to disperse the oil along the shoreline.
(b) Spray the oil with toxic chemical dispersants to form an emulsion which can be broken down by microorganisms.
(c) Sprinkle sand over the spill to draw the oil particles downwards to the ocean floor, where it will be broken down by benthic microorganisms.
(d) Use containment booms to collect the oil and then pump it into tankers.

12. Which one of the following options describes the correct procedure a snorkeller should follow when performing a duck dive?

	Step 1	Step 2	Step 3	Step 4
(a)	Kick your legs.	Take a deep breath and bend at the waist.	Equalise the pressure in your ears.	Look up and turn 360°.
(b)	Take a deep breath and bend at the waist.	Kick your legs.	Equalise the pressure in your ears.	Look up and turn 360°.
(c)	Look up and turn 360°.	Equalise the pressure in your ears.	Kick your legs.	Take a deep breath and bend at the waist.
(d)	Take a deep breath and bend at the waist.	Kick your legs.	Look up and turn 360°.	Equalise the pressure in your ears.

See next page

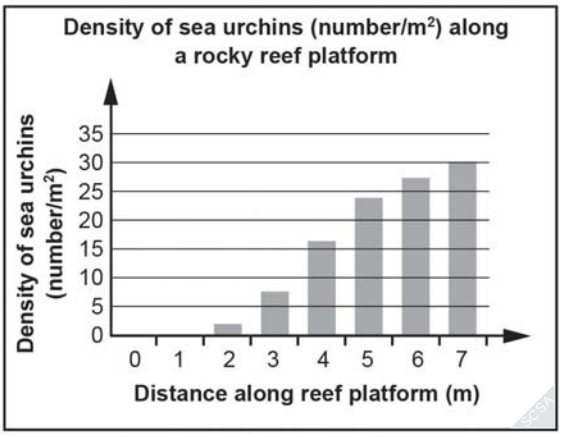
13. A group of students surveyed a local rocky reef platform to measure sea urchin abundance and distribution. The data that they collected are shown below in Table 1.

Table 1: The abundance and distribution of sea urchins along a local rocky reef platform.

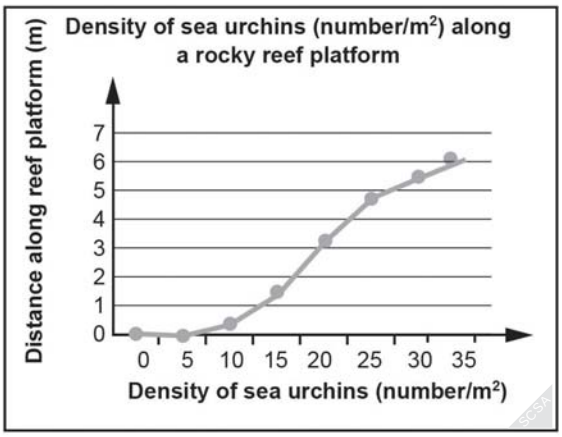
Distance along rocky reef platform from datum (m)	Density of sea urchins (number/m^2)
0	0
1	0
2	2
3	7
4	16
5	24
6	28
7	30

Which one of the following options is the **best** way of displaying the data collected by the students?

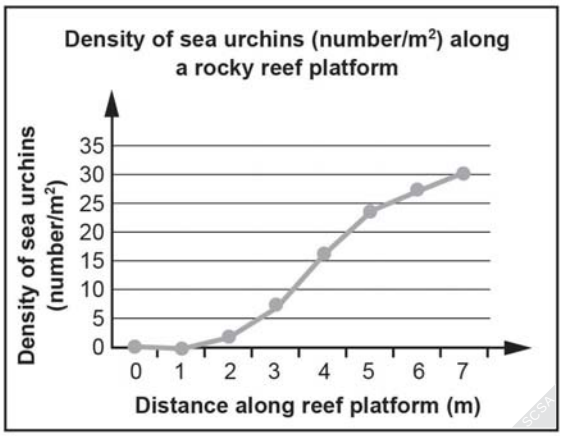
(a)



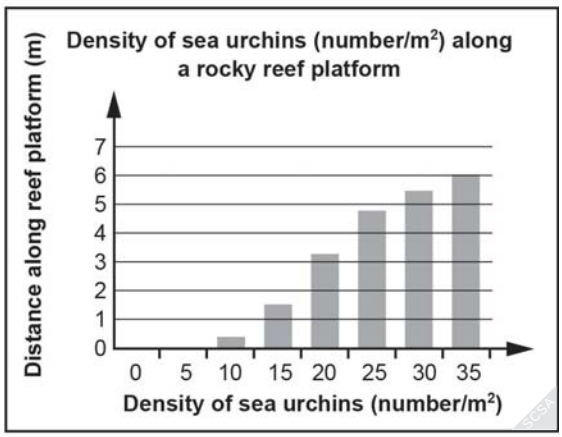
(b)



(c)



(d)



See next page

14. Who was responsible for commanding the mutineers who committed murders and other atrocities against the survivors who were marooned on Batavia's Graveyard in 1629?

(a) Weibbe Hayes
(b) Jeronimus Cornelisz
(c) Adriaen Jacobsz
(d) Francisco Pelsaert

15. Which one of the following design features is unique to a wave piercer hull?

(a) twin hulls that minimise hull cross-sectional area at the sea's surface
(b) no keel counterweight since the righting moment is derived from the spacing between multiple hulls
(c) low mass that displaces less water
(d) very fine bow with reduced buoyancy in the forward portions

16. The diagram below illustrates the generalised shift in the biomass of major groups of primary producers, leading to increasing nutrient enrichment in shallow coastal waters.

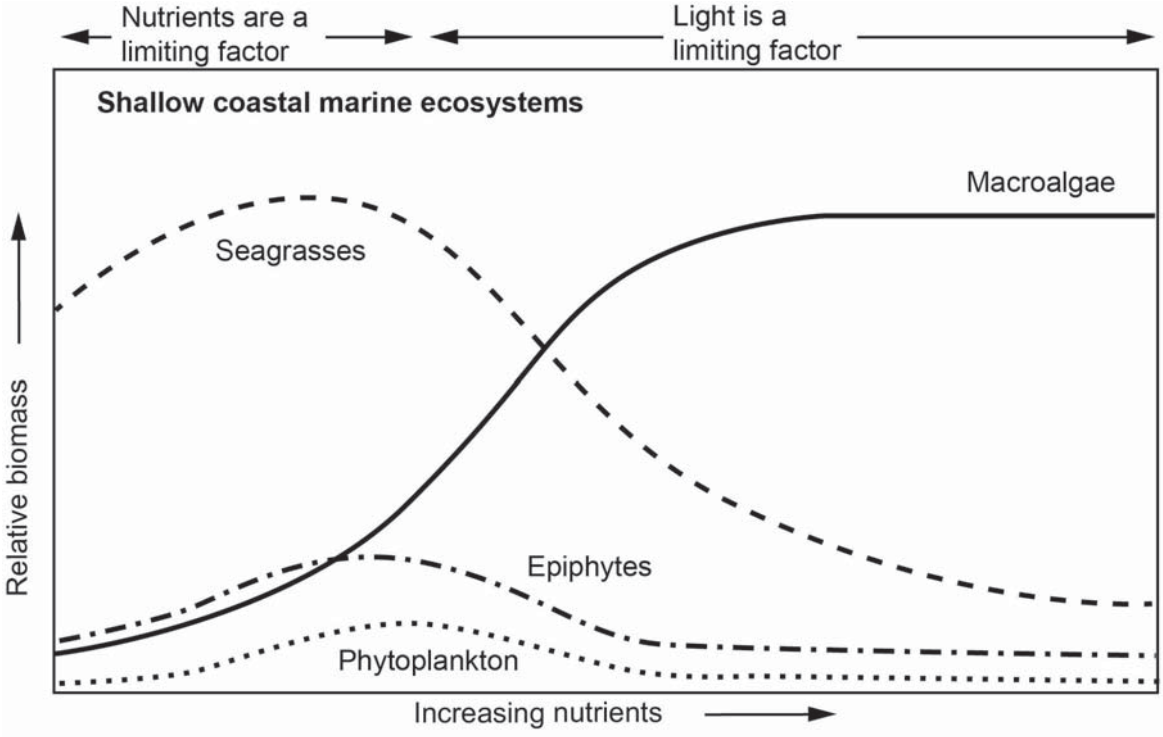


Figure 1: Nutrient/biomass relationship

A valid conclusion that could be drawn from the information shown above is

(a) light limits primary production (photosynthesis) in nutrient-poor conditions for the shallow coastal marine ecosystems.
(b) macroalgae dramatically decrease with increasing nutrients in shallow coastal marine ecosystems.
(c) as eutrophication progresses with increasing nutrient enrichment, light becomes the limiting factor for shallow coastal marine ecosystems.
(d) seagrasses become the dominant species in the shallow coastal marine ecosystems when the water conditions are eutrophic.

See next page

17. When studying for an examination, a student wrote some revision notes about Marine Protected Areas (MPAs) in her workbook. These notes are shown below and are numbered 1–4.

1	MPAs include marine parks, nature reserves and locally-managed marine areas that protect reefs, seagrass beds, shipwrecks and marinas.
2	MPAs help protect important habitats and representative samples of marine life and can assist in restoring the productivity of the oceans.
3	The establishment of a MPA is an excellent way of raising the profile of an area for marine tourism and broadening the local economic options.
4	MPAs can provide reservoirs of genetic material for the natural or assisted recovery of areas affected by pollution, by overfishing or natural causes.

Unfortunately, she didn't copy all of the details about MPAs correctly into her workbook.

Which of the following combinations of numbers show the points that describe correctly the information about MPAs?

(a) 2, 3 and 4
(b) 1, 3 and 4
(c) 1, 2 and 4
(d) 1 and 4

18. Key design features of a rigid, inflatable boat (RIB) include

(a) shallow draught, solid, shaped hull with flexible tubes at the gunwales.
(b) deep draught and completely inflatable hull.
(c) shallow draught and completely inflatable hull.
(d) shallow draught, solid, shaped hull with flexible tubes at the bow and stern.

See next page

19. Below is an abbreviated list of methods used to treat the *Batavia* timbers when they were transported from the wreck site at the Abrolhos Islands to the Western Australian Maritime Museum in Fremantle.

The methods are not listed in the correct sequence.

	Methods used to treat the *Batavia* timbers
1	Removal of concretions using picks, bolsters and water sprays.
2	Desalination by soaking the timbers in distilled water.
3	Periodic spraying of the timbers with seawater to minimise thermal shock.
4	Treatment in polyethylene glycol (PEG) baths of increasing concentration.
5	Packaging in large plastic bags which are then sealed in heavy-duty black plastic bags containing seawater and a biocide.

The correct order of events is

(a) 1, 2, 3, 4, 5.
(b) 1, 5, 3, 4, 2.
(c) 5, 3, 1, 2, 4.
(d) 5, 1, 3, 4, 2.

20. The enhanced greenhouse effect could shut down the thermohaline circulation by altering the circulation patterns in the North Atlantic Ocean.

The **most** probable reason for this shut down by the enhanced greenhouse effect is

(a) increasing atmospheric pressure which increases the seawater temperature.
(b) the injection of fresh water from polar ice melts into the Arctic Ocean, which dilutes the seawater thus reducing its density.
(c) an increase in the volume of water from rising sea levels which causes the circulation to sink.
(d) the high rate of evaporation of seawater, which causes the salinity of the seawater to decrease and thus sink.

End of Section One

See next page

Section Two: Short answer **50% (70 Marks)**

This section has **six (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.
- 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: 90 minutes.

Question 21 **(13 marks)**

(a) Wreck sites can be large, with many obvious features, but still be invisible to the untrained eye. Diving conditions can be tiring, with currents and surges often hampering accessibility. This was the case when excavating the *Batavia*, where 'diving days' were, on average, one in every three days. Meticulous processing and recording are therefore essential to the success of any underwater excavation.

Complete the table below to describe how you might record underwater any features or artefacts found on a wreck site such as the *Batavia*. (4 marks)

Technique	Method used to record underwater features or artefacts
Underwater recording of wreck site	
Underwater photographic recording of wreck site	

See next page

(b) Many interesting artefacts were recovered from the wreck of the *Batavia*, including 137 shaped sandstone blocks.

(i) Of what use were these blocks on board the *Batavia* while at sea? (1 mark)

(ii) Why was the *Batavia* carrying these blocks and what was their supposed use to be in the city of Batavia (present-day Jakarta)? (2 marks)

(iii) Present evidence that supports the proposed use of these blocks in the city of Batavia. (3 marks)

(iv) Imagine that a sandstone block is to be lifted to the surface of the sea from a depth of 10 m: the volume of the block is 0.4 m^3; the weight of the block in air is 960 kg and when submerged is 548 kg; and the amount of upthrust acting upon the block is 412 kg.

In the scenario that air-filled lift bags were actually used, calculate the volume of air required to complete the lift from a depth of 10 m. Assume that the density of seawater is 1030 kg/m^3 and that 1.0 m seawater is 0.103 bar pressure. Show **all** workings. (3 marks)

See next page

Question 22 **(7 marks)**

Consider the diagrams shown below (Figures 2A and 2B).

For copyright reasons this image cannot be reproduced in the online version of this document but may be viewed at www.maritimenz.govt.nz/Recreational-Boating/Lifejackets/Survive-in-cold-water.asp

Figure 2A **Figure 2B**

(a) What are the people in the above diagrams doing? (2 marks)

(b) Explain how this helps their survival in the water. (2 marks)

(c) What condition may eventuate from being in the water for an extended period of time? Give **two** signs or symptoms of this condition. (3 marks)

Condition: _____

Sign/symptom one: _____

Sign/symptom two: _____

See next page

Question 23 **(20 marks)**

The West Coast Demersal Scalefish Fishery is a multi-species fishery that lands over 100 different species (Wise *et al.*, 2007). The fishery operates in the waters from Kalbarri to Augusta (West Coast Bioregion) and the key indicator species are dhufish, pink snapper and baldchin groper.

In recent years, there has been growing concern about the sustainability of demersal scalefish stocks (population sizes) in the West Coast Bioregion.

(a) Give **two** reasons why the levels of demersal scalefish stocks are thought to be unsustainable in the long term. (2 marks)

(b) Give **two** reasons why modern day fishing is so effective. (2 marks)

Question 23 (continued)

Fishery-dependent sampling assumes that the catch is representative of the fished population.

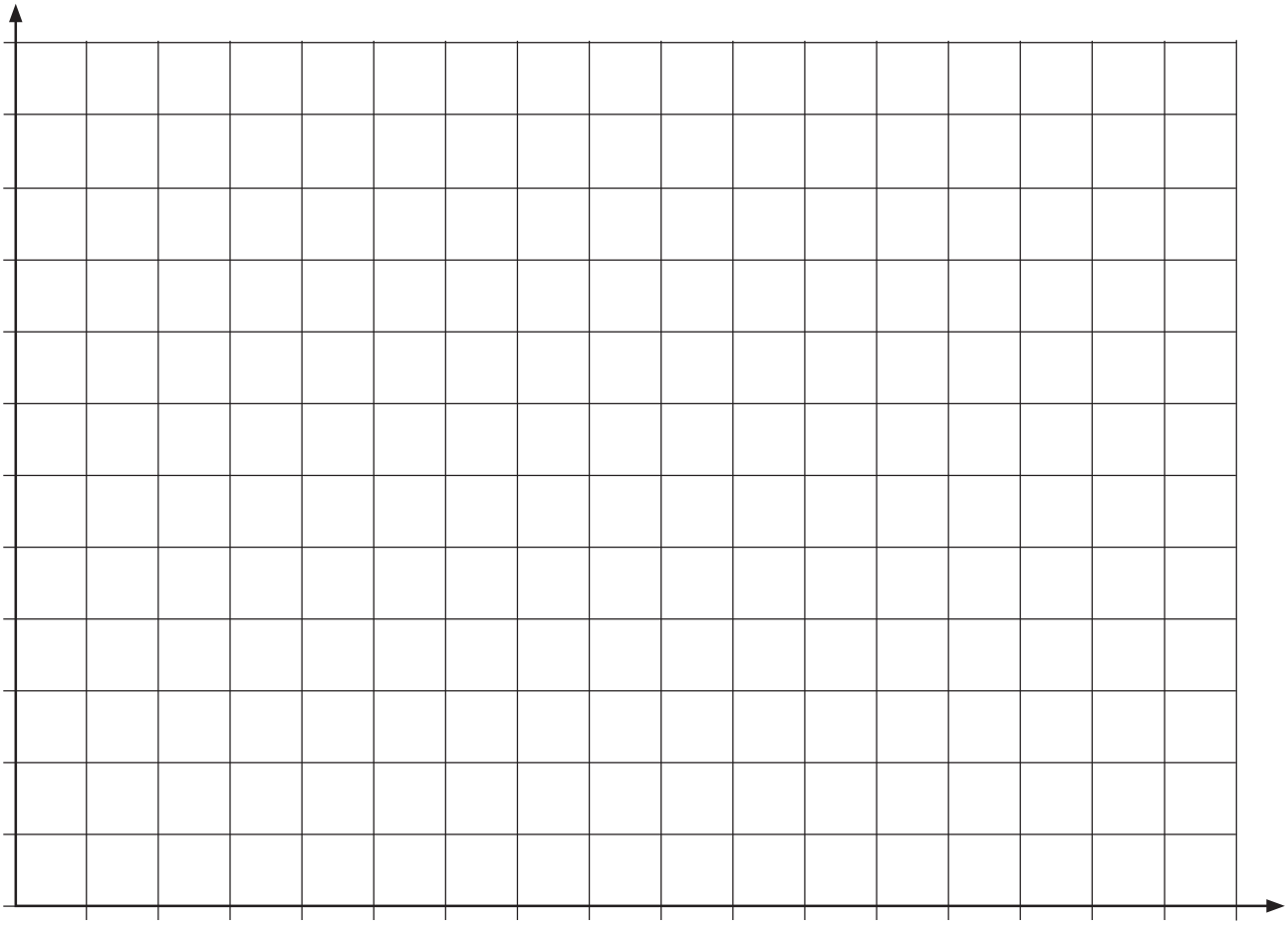
A study collected data of indicator species from boat-based recreational and commercial fisheries. These samples were used to determine the age composition for stocks in each area of the West Coast Bioregion (Wise *et al*., 2007).

The table below is an adaptation of the pink snapper age samples collected from the recreational fisheries in the metropolitan zone between 2003 and 2006.

Age (years)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Frequency (catch)	0	5	20	125	225	140	50	15	20	5	0	2	2	0	2	0

(c) (i) Graph these data on the grid below. (5 marks)

If you want to make a second attempt at this item, the grid is repeated at the end of this Question/Answer booklet. Indicate clearly on this page if you have used the second grid and cancel the working on the grid on this page.



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(ii) Describe the patterns shown in the age compositions for the pink snapper stocks in the metropolitan zone between 2003 and 2006. (3 marks)

(iii) Suggest **two** possible causes for the trends in these data. (2 marks)

(iv) How might the researchers have increased the reliability and accuracy of their data? (2 marks)

From such data, estimates of fishing mortality were calculated and the levels of exploitation of both dhufish and pink snapper across all sections of the West Coast Bioregion were discovered to be above the international benchmark standards (Wise *et al.*, 2007).

(d) Describe **two** appropriate management actions and explain how they would help address the decline in demersal scalefish stocks in the West Coastal Bioregion. (4 marks)

Question 24 **(12 marks)**

(a) Describe the seasonal movement of sand in a natural beach system in reaction to summer and winter patterns. (6 marks)

Summer: _____

_____

_____

_____

Winter: _____

_____

_____

_____

(b) In the space below, draw **two** labelled diagrams to illustrate the differences in profiles between an accreting beach and an eroding beach. Your diagrams should include the location of the high and low tide marks and make reference to the profile angle and the location of any sand deposits. (6 marks)

Accreting beach	
Eroding beach	

See next page

Question 25 **(4 marks)**

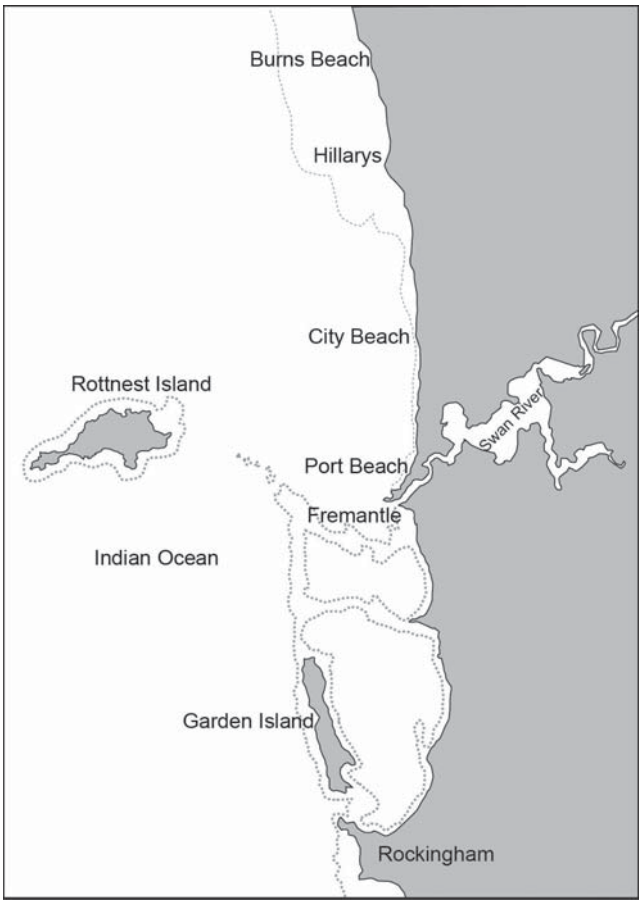


Figure 3: Location of Garden and Rottnest Islands with respect to the Perth coastline.

Along the Fremantle to Hillarys section of Perth's coastline, Garden and Rottnest Islands act as barriers to the northward littoral drift. It is thought that very little sediment from the longshore drift reaches the northern Perth coastline.

This is supported by trends observed in the southern beaches in this region (Port Beach to City Beach) which experience average erosion rates of 1 m/year, whereas the beaches north of City Beach experience average accretion rates of 1 m/year.

Using your understanding of longshore currents and sand budgets, give a possible explanation as to why this difference between the southern and northern beaches of this section of Perth's coastline exists.

See next page

Question 26 **(14 marks)**

The maps of the Perth coastal waters shown below are from a study entitled *The Hillarys Transect (3): Optical and chlorophyll relationships across the continental shelf off Perth* (Fearns *et al.*, 2007).

These maps were generated from the National Aeronautics and Space Administration (NASA) global ocean colour monitoring satellite technology called Sea-viewing Wide Field-of-view Sensor (SeaWiFs) and they show the amount of phytoplankton in the coastal waters off Perth during different seasons.

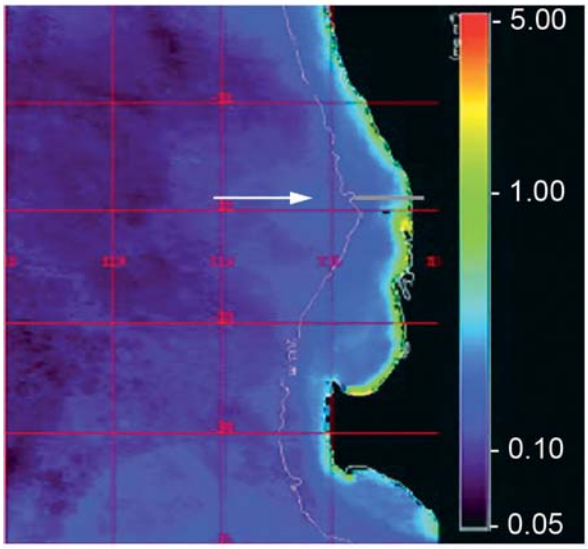


Figure 4A: Monthly composite for December 1997, representative of a summer chlorophyll distribution pattern.

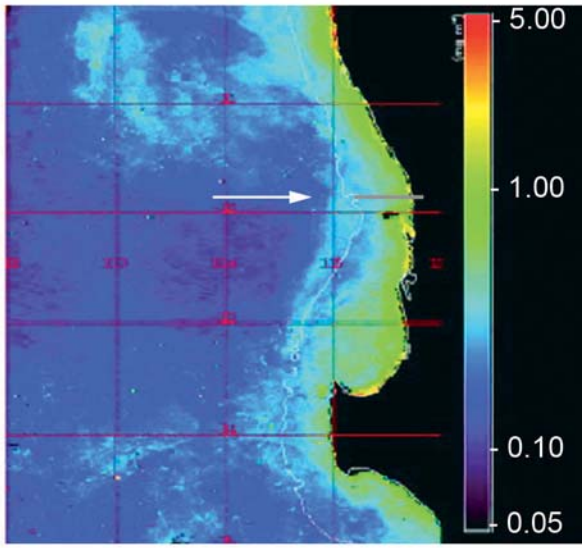


Figure 4B: Monthly composite for May 1998, representative of a winter chlorophyll distribution pattern.

The 200 m bathymetric contour indicates the approximate location of the edge of the continental shelf. The location of the Hillarys transect line is shown as a grey line in both maps and is additionally identified by a white arrow showing its approximate location.

(a) What does the abundance of chlorophyll on a SeaWiFs map indicate about the amount of phytoplankton present in a given area? (2 marks)

(b) Describe the chlorophyll distribution pattern shown for

(i) summer. (2 marks)

See next page

(ii) winter. (2 marks)

(c) Provide **two** reasons to account for the winter distribution pattern shown in Figure 4B. (4 marks)

(d) A transect is a path along which data are collected. Figures 4A and 4B show the location of the Hillarys Transect on the SeaWiFs maps.

Explain how sampling along this transect line would complement the data shown by the SeaWiFs maps. (4 marks)

End of Section Two

See next page

Section Three: Extended answer **30% (50 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.

- 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 question that you are continuing to answer at the top of the page.

Suggested working time: 70 minutes.

Question 27 **(25 marks)**

According to the 2012 State of Australian Cities report, Perth and Darwin have experienced the highest rates of sea level rise of all Australian major coastal cities. Since 1993, the Perth sea level has risen nine to ten millimetres per year, as detected by tidal gauge measurements at Hillarys, Western Australia. This is well above the global average of approximately three millimetres per year. The report also mentions that Perth's average annual minimum and maximum air temperatures have increased over the past 60 years.

(a) Describe the likely cause of Perth's increase in average annual air temperatures. (5 marks)

(b) Describe **two** ways in which an increase in atmospheric temperatures may cause global sea levels to rise. (6 marks)

(c) For each of the following, list **two** impacts of rising sea levels.

(i) physical environment (2 marks)

(ii) marine communities (2 marks)

(iii) human life (2 marks)

(d) The Department of Climate Change reported in 2009, that 'along the Western Australian coast there are approximately 2100 residential buildings located within 110 m of "soft" erodible shorelines'. Furthermore, it stated that 'in the absence of coastal protection measures or other adaptation responses, these buildings may be at risk'.

Describe how a groyne (hard engineering) and beach nourishment (soft engineering) would be effective coastal protection measures to protect threatened areas. In your answer include **one** advantage and **one** disadvantage associated with each protection measure. (8 marks)

See next page

Question 28 **(25 marks)**

The following is an excerpt taken from Hugh Edwards's book *'Islands of Angry Ghosts'* (p.144), which describes the process of recovering the cargo in 1629.

> Pelsaert's chest remained fathoms deep with the *Batavia* wreck. His divers had not been disgraced in leaving it. The four Indians from Gujarat and the two Hollanders (the Indians were probably pearlers, but it is strange that white men should have been diving in that century) had swum down three fathoms, holding their breath, peering about them with unprotected eyes, half blind in the blur of the water. They had dived til their lungs ached, their heads buzzed, and their eyes were red-rimmed and weeping from the salt. And – for the honourable Company – from that shambles of splintered wood, twisted cables and snaring ropes that was the wreck, they recovered ten of the twelve money chests, a quantity of silver dishes and candlesticks, carpenter's chests, chests of tinsel and loose coins, all at some peril to their lives.

(a) List **three** pieces of snorkelling equipment that were **not** available to the *Batavia* divers mentioned in the above passage and describe how these pieces of equipment help modern day snorkellers. (6 marks)

(b) It is possible that the *Batavia* divers were swimming alone, while duck diving at regular intervals to retrieve specific items.

What modern snorkelling procedure did they **not** follow and how might this have further contributed to the dangerous situation that they were most likely experiencing? (3 marks)

(c) What snorkelling medical emergencies might the *Batavia* divers have faced due to their diving practices? Describe how these medical conditions could arise. (4 marks)

(d) The *Batavia* divers carried salvageable items in their arms as they ascended to the waiting boat. The size of these items was dependent upon the physical strength and ability of the divers.

In the period 1970–1974 the Western Australian Museum recovered some of the heavier items from the *Batavia* wreck. What retrieval method was used in this recovery? Explain how this method works and why it was not available to the *Batavia* divers. (4 marks)

(e) Not all of the money chests were recovered by the *Batavia* divers. It is generally accepted that two money chests remained with the shipwreck and these contained silver Rijksdaalders from the Netherlands and German thalers (dollars).

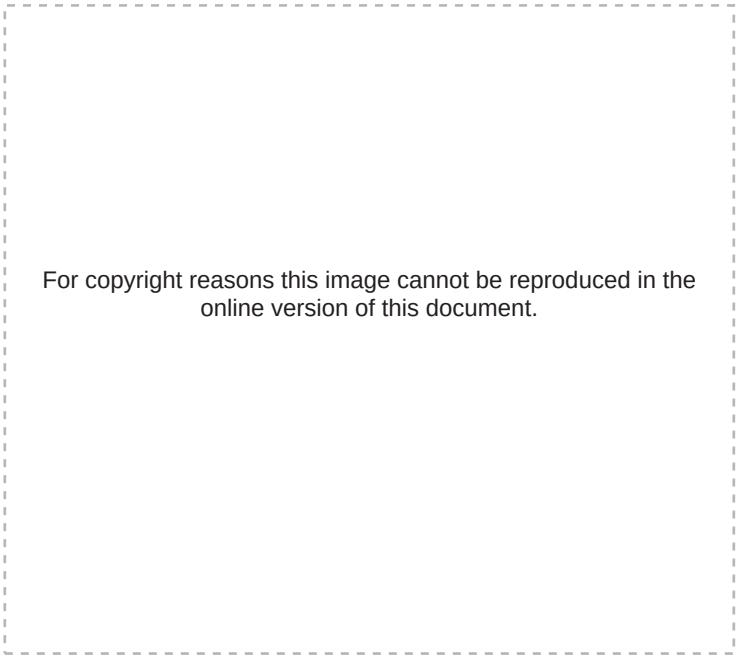
Describe **two** types of decay processes that would have occurred to the silver coins while underwater and explain how these coins were restored for exhibition. (8 marks)

See next page

Question 29 **(25 marks)**

In October 2012, a group of amateur fishermen were fishing for crabs in the Swan River. In their catch, they noticed an unusual looking species of crab with six spines on its claws, while netting in the bay under the Mosman Park cliffs (Mosman Bay).

The Department of Fisheries later identified the unusual crab as *Charybdis japonica* (Asian paddle crab or lady crab). A biosecurity team was sent to the bay to investigate the matter further and the incident was reported to the Consultative Committee on Introduced Marine Pest Emergencies.



(a) What is an 'introduced species'? Give **three** reasons why introduced species are detrimental to the marine environment. (8 marks)

(b) The Asian paddle crab is found in countries such as China, Japan and Taiwan.

Describe **two** ways in which the species may have travelled from its natural habitat range to the section of the Swan River where it was caught. (4 marks)

(c) When the biosecurity team was sent to Mosman Bay to investigate the appearance of the Asian paddle crab, they set more than 100 crab traps.

(i) Why were so many traps set? (2 marks)

(ii) Outline a scientific method that the team may have followed detecting or monitoring the long-term presence of the Asian paddle crab in Mosman Bay.

Your answer should include reference to an hypothesis, the independent, dependant and controlled variables and a possible method for conducting the survey. (8 marks)

(d) The biosecurity team did not detect the presence of the Asian paddle crab in Mosman Bay. If you were an environmental consultant, what **three** recommendations would you make to monitor or limit the extent of the Asian paddle crab invasion of the Swan River? (3 marks)

See next page

Question 30 **(25 marks)**

(a) Discuss the relative advantages, disadvantages and **one** use of each of the following hull design types.

(i) hard chine (5 marks)

(ii) trimaran (5 marks)

(iii) hydrofoil (5 marks)

(b) Vessels exhibit specific variations in their design according to their use. For example, the layout of a commercial rock lobster vessel may look completely different from that of a recreational dive boat. This is primarily due to the different nature of work that each vessel undertakes.

Compare the design features of a commercial fishing boat with that of a recreational dive boat and explain how the two vessel types vary according to their specific use.

(10 marks)

End of questions

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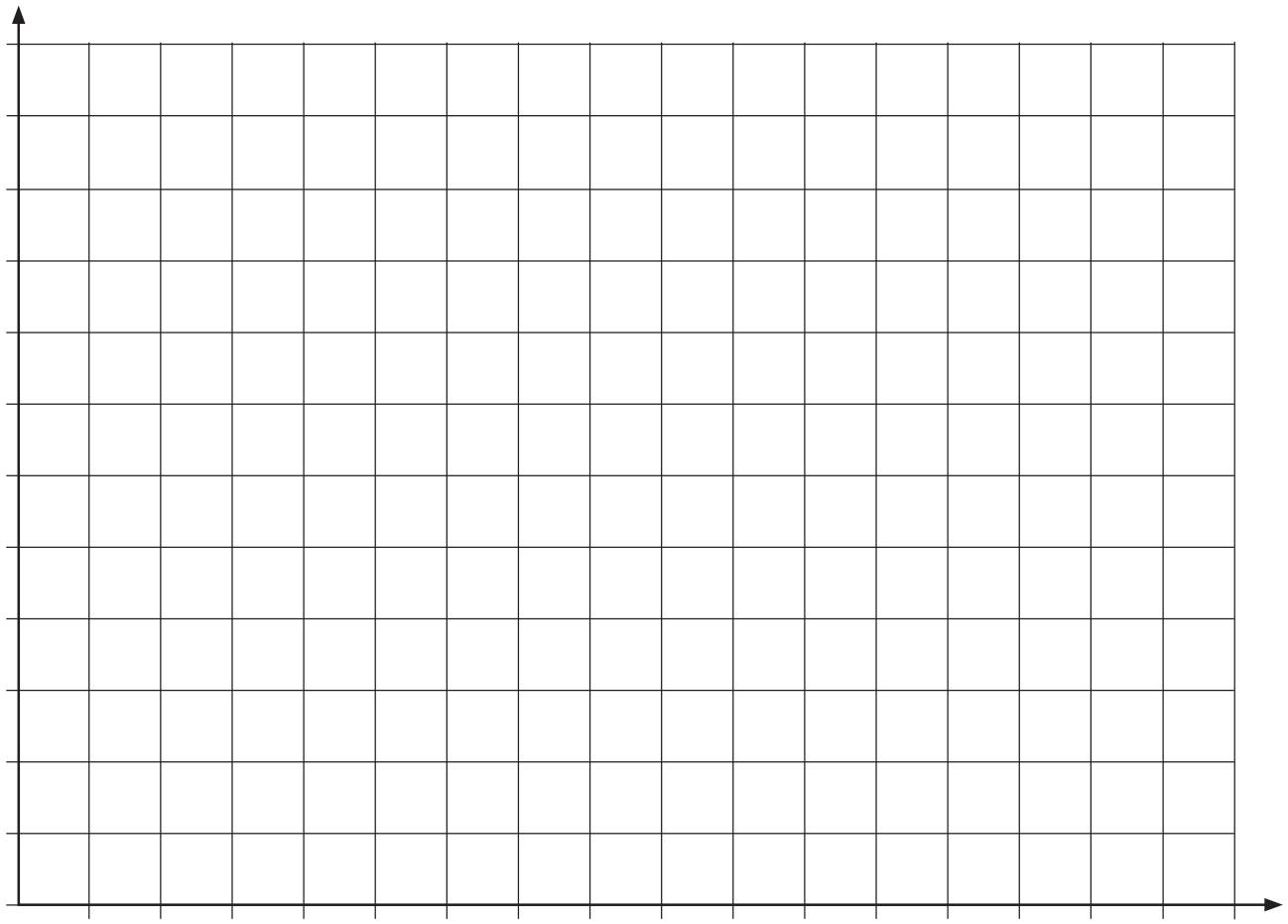

ACKNOWLEDGEMENTS

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