MARINE STUDIES

EXAM QUESTIONS

CLARIDGE

JENSEN

McINTOSH

MALONEY

MOFFATT

NICHOLAS

PERRY

RYAN

WATERHOUSE

Published by
Wet Paper Publishers and Consultants
PO Box 540
COOLANGATTA 4225
www.wetpaper.com.au
info@wetpaper.com.au

ISBN (2025 E Pub)
978-1-86283-124-7

Disclaimer

Although all care has been taken to provide information, safety instructions, offers of training and advice, Wet Paper or any of its sponsors, employees, advisors or consultants accept no responsibility for any accident that may occur as a result of students performing any of these activities. If students, teachers or instructors are unsure of any information or method, they are advised to contact their own State Government Marine Safety or Education Department.

Contents

Acknowledgements

The publishers wish to thanks the Premiers Department for permission to use the following schools exam papers as trial materials for this publication.

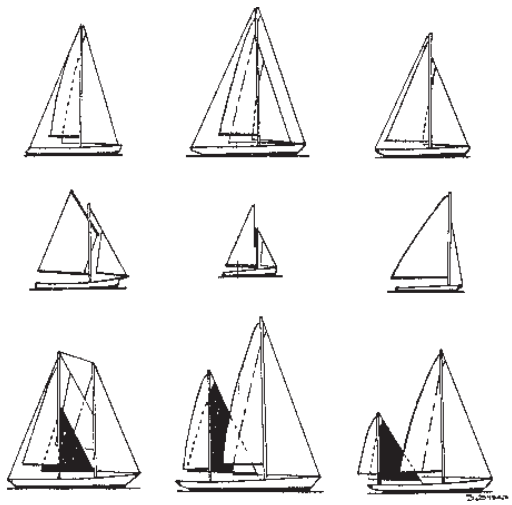
Maryborough State High School
Innisfail State High School
St Augustines College Cairns
Rochedale State High School
Hervey Bay Senior College
Gympie State High School
Kawana Waters State High School
Benowa State High School

The publishers wish to thanks the following individuals for supplying their exam questions in this publication

John Burns
Ken Young
Jim Cash
Sel Wensley
Czeck Kersevani
Tanya Martin
Rob Shennan
Sue Cerato
Bob Moffatt
John Howard
Tony Failes
Ann Summers
Jill Green
Steve Hall
Dianne Hempenstall
Graham Mitchell
Ann Kenny
Steve McCabe
David Reid
Margaret Evans
Veira Weitsz
Stanna Hodge
Greg Martin
Lisa Virtue
Mark Warne
Don Reid
Bruce Heyer
Greg Gallagher

Topic 1

Exam questions

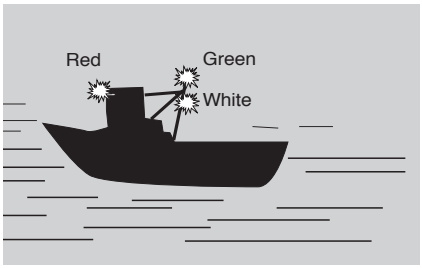


BOATING AND PILOTAGE

Q 1 You are approaching at speed an anchored dinghy in which people are fishing. What actiondo you take?

(a) Stand on. Maintain course and speed. However if other boat does not give way take all action to avoid collision.
(b) Keep clear.
(c) Steer to pass more than 30 metres off. If this is not possible, reduce to four knots.
(d) Steer to pass more than 50 metres off. If this is not possible, reduce to four knots.

Q 2 The lights shown to the right were seen by a mariner at sea. The boat is most probably:-

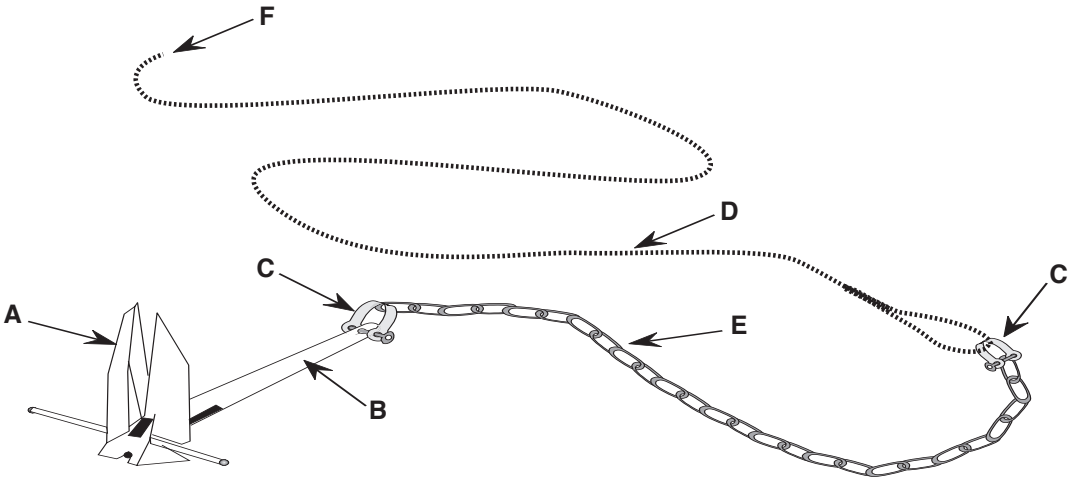


(a) A trawler engaged in fishing, less than 50 metres.
(b) A sailing boat under way less than 50 metres.
(c) A power boat, moored less than 60 metres.
(d) A vessel trawling, less than 50 metres in length, under way.

Q 3 The knot shown to the right is particularly useful for:-

(a) Tying a painter to a pole.
(b) Towing another boat.
(c) Tying boats to a trailer.
(d) All of the above are correct.

The next three questions refer to the diagram of the anchor rig below



Q 4 Name the parts of the anchor labelled A, B, C, D and E.

Q 5 What knot would you tie at F and where would be the best place to tie it?

Q 6 You are in a 12 foot dinghy and wish to anchor in 8 metres of water. Draw a diagram showing how much cable you would play out and what it would look like underwater.

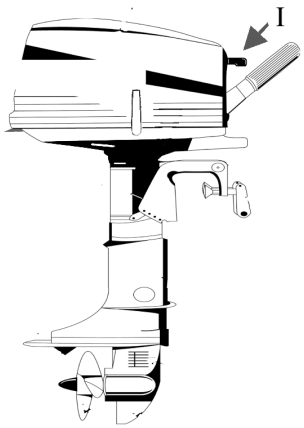
Q 7 A power boat is crossing your bow from starboard to port. There is a risk of collision. What do you do?

(a) Stand on. Maintain course and speed. However if other boat does not give way take all action to avoid collision.
(b) Keep clear, reduce speed or stop if necessary. Do not pass ahead of him.
(c) Alter course to port, pass in front of him.
(d) Alter course to port, pass behind him.

The next two questions refer to the diagram below

Q 8 The part labelled I is called:-

(a) The pull start.
(b) Throttle handle.
(c) Accelerator button.
(d) Powerhead.



Q 9 The motor is in:-

(a) No gear.
(b) Forward gear.
(c) Neutral.
(d) Reverse gear.

Q 10 You are approaching, at speed, a large vessel in a main shipping channel. What action do you take?

(a) Stand on. Maintain course and speed. However if other boat does not give way take all action to avoid collision.
(b) Keep clear.
(c) Steer to pass more than 30 metres off. If this is not possible, reduce to four knots.
(d) Steer to pass more than 50 metres off. If this is not possible, reduce to four knots.

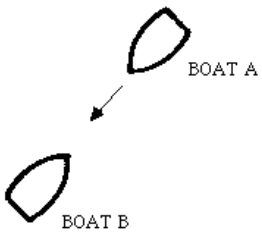
Q 11 Which of the following is incorrect?

(a) A person over the age of 12 may drive a speed boat provided they are accompanied by a licenced driver.
(b) The minimum age required to obtain a boat licence is 15.
(c) The port side is the left side.
(d) The lateral system of buoyage is replacing the cardinal system in all Australian states.

Q 12 What regulation lights are carried on a 5 metre power driven vessel under way?

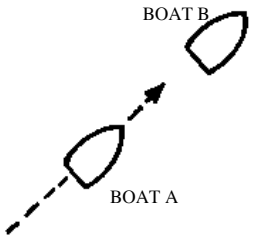
(a) Port (green), starboard (red) and a stern (white) light.
(b) Starboard (green), port (red) and a stern (white) light.
(c) Port (green), starboard (red) and a white all round light.
(d) Starboard (green), port (red) and a white all round light.

Q 13 Consider the following boating situation where boat A is approaching boat B. Which of the following is true?



(a) Boat B should give way.
(b) Boat A should give way.
(c) Boat A should move to port and boat B to port.
(d) Boat B should move to starboard and A to starboard.

Q 14 In the situation to the right, boat A is about to overtake boat B. Which of the following is true of boat A:-



(a) Slow down and proceed to the port side.
(b) Stand on and proceed to the starboard side.
(c) Stand on and proceed to the port side.
(d) Maintain speed and pass either side.

Q 15 A ferry is crossing your bow from starboard to port. There is risk of collision. What do you do?
(a) Stand on. Maintain course and speed. However if the ferry does not give way take all action to avoid collision.
(b) Keep clear, reduce speed or stop if necessary. Do not pass ahead of him.
(c) Alter course to starboard to pass in front of him.
(d) Alter course to port and pass in front of him.

Q 16 In narrow channels, which is the correct side of the channel for a power driven boat under way?
(a) The side on the starboard hand; keep to the left.
(b) The side on the port hand; keep to the right.
(c) The side on the starboard hand; keep to the right.
(d) The side on the port hand; keep to the left.

Q 17 When seated behind the driver's wheel looking towards the front of the boat, which is the starboard side?
(a) The front of the boat.
(b) Both sides of the boat.
(c) The left side of the boat.
(d) The right side of the boat.

Q 18 When seated behind the driver's wheel looking towards the front of the boat, which is the port side?
(a) The front of the boat.
(b) Both sides of the boat.
(c) The left side of the boat.
(d) The right side of the boat.

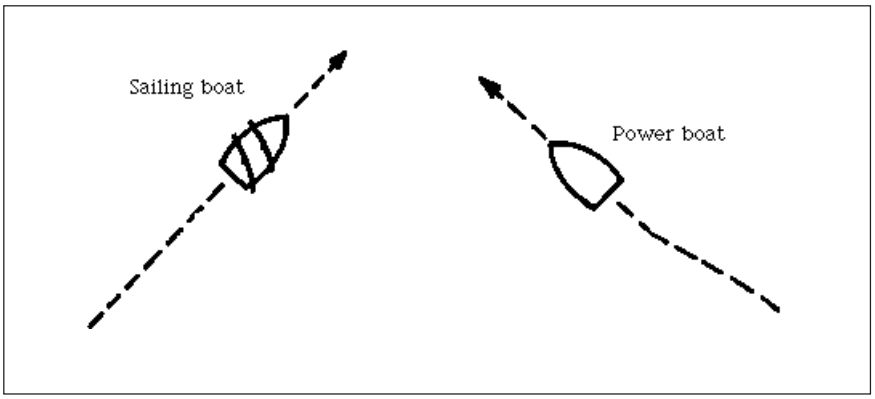
Q 19 What is the minimum age of an observer in a speedboat engaged in water skiing activities?

(a) 12 years.
(b) 15 years.
(c) 16 years.
(d) 17 years.

Q 20 What is the minimum distance a water-ski boat or skier is permitted to approach the bank in Tallebudgera Creek at speeds in excess of 4 knots?

(a) 15 metres.
(b) 30 metres.
(c) 50 metres.
(d) 100 metres.

The next question refers to the diagram below in which a power boat is approaching a sailing boat



Q 21 The power boat should:-

(a) Slow down and pass the sailing vessel astern.
(b) Stand on. Reduce speed if there is risk of collision.
(c) Stand on and cross in front of the sailing vessel.
(d) Slow down and wait till the vessel has passed.

Q 22 The mariner below is leaving port. He should pass the marker indicated so that it is:-

(a) On his starboard side.
(b) On his port side.
(c) Astern.
(d) Ahead.

Q 23 You are approaching a bank and see bathers where you want to beach your boat. What action do you take?

(a) Stand on. Maintain course and speed. However if the bathers do not get out of your way take all action to avoid them.
(b) Keep clear.
(c) Steer clear. If within 30 metres, reduce speed to four knots and go to another beach.
(d) Steer clear. If within 30 metres, reduce speed to four knots. If very close cut the motor.

Q 24 What regulation lights are carried on a sailing vessel under way?

(a) Port (green), starboard (red) and a stern (white) light.
(b) Starboard (green), port (red) and a stern (white) light.
(c) Port (green), starboard (red) and a white all round light.
(d) Starboard (green), port (red) and a white all round light.

Q 25 What is indicated when a power driven vessel under way makes one short blast on the whistle or siren?

(a) I am altering my course to port.
(b) I am altering my course to starboard.
(c) I am proceeding up river or approaching a bend going up river.
(d) I am proceeding down river or approaching a bend going down river.

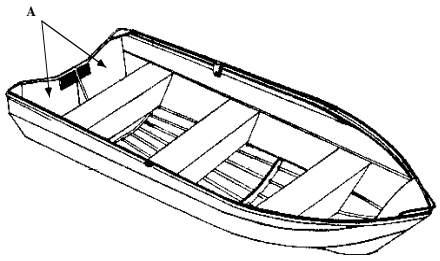
Q 26 The port of Southport extends as far as....., where the direction of buoyage changes to the port of Brisbane.

(a) Wavebreak Island.
(b) The Southport Bridge.
(c) Tipplers Resort.
(d) Jumpinpin bar.

Q 27 A mariner went to start a cold engine, connected the fuel tank, pumped the bulb, pulled the starting cord about 15 times and the motor would not start. His friend then disconnected the fuel hose, pulled the cord a few times and the engine started. The most probable reason for this was:-

(a) The spark plug was dirty.
(b) The sheer pin was broken.
(c) There was dirt in the fuel line.
(d) The engine was flooded.

The next three questions refer to the diagram below



Q 28 What is the name given to the part labelled A?

(a) Tiller
(b) Gunwale
(c) Bollard
(d) Transom

Q 29 The position on the boat labelled A is the:-

(a) Bow.
(b) Port side.
(c) Starboard side.
(d) Stern.

Q 30 What are the conditions required, for a boat of this type, to be "in survey"?

These Questions refer to tides

The following is the tide data for Cairns on a particular day.

Time	Ht (m)
0145	.2
0800	3.1
1355	.4
2010	2.8

Q 31 Calculate the depth of water, in Cairns, on the above day at 1030 (show working clearly).

Answer the following question with reference to this table

Tidal Information for Secondary Ports				
Place	Av. time difference		Ratio	Constant
	High Water	Low water		
Cooktown	-0.04	-0.04	.96	-0.14

Q 32 The table for Cairns shows that there will be a high tide at 0800. At what time will this high tide be in Cooktown?

Q 33 What does the term tidal range refer to?

Q 34 How much later than the standard port will be the time of the morning high tide at Ungowa on Thursday November 22nd?

Refer to the extracts from the tide book.

Q 35 (a) My chart of the mouth of the Burrum River shows a sand bar marked 0.3. What is the earliest time I could take my motor sailer over the bar on the afternoon of 19th September if the vessel draws 1.8m.

(b) Using the standard port of Bundaberg, what will be the height of the tide at Boonlye Point at 4 am on 6th April 1991. Show calculations.

(c) By the rule of twelfths, what amount of water will have flowed out during the first **three** hours of a full tide?

(d) Using the standard port of Bundaberg, what will be the height of the tide at Big Tuan at 4 pm on 10th April 1991. Show calculations.

Q 36 A certain outboard motor has a petrol/oil ratio of 50:1. How much oil should you add to 25l of petrol to make the correct fuel mixture?

Q 37 List the 6 items of safety equipment that must be carried by all small craft (under 4.88 m) in smooth water.

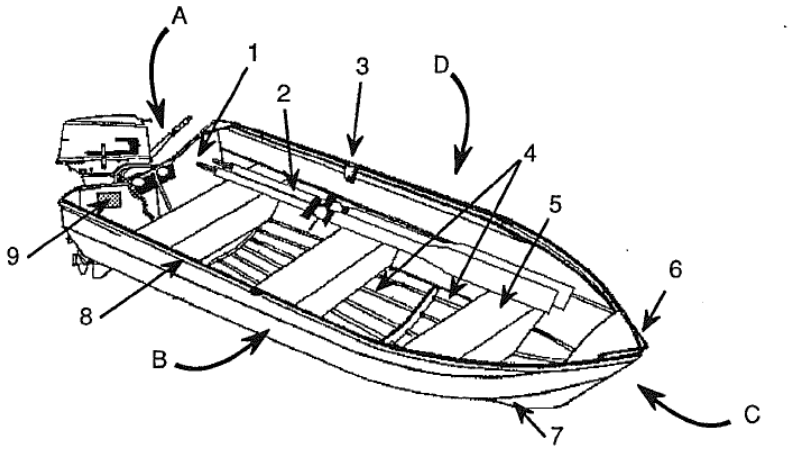
Q 38 List 2 examples of distress signals for each category below.
(a) Visual.
(b) Sound.
(c) Electronic (radio).

Q 39 What are the 4 items of information that a vessel in distress should communicate to rescuers?

Q 40 At what speed should a craft move through an anchorage?

Q 41 The term "brought up" means:-
(a) To bring the anchor onto the boat.
(b) To lift the anchor off the bottom.
(c) The boat is correctly anchored and stationary.
(d) The anchor is dragging on the bottom.

The next two questions refer to the diagram of the boat below



Q 42 Label the parts of the boat numbered 1 - 9 (use correct nautical terms).

Q 43 Name the sides of the boat labelled A, B, C, D.

Q 44 A red lateral mark is:-
(a) A port mark and is kept to port when entering port.
(b) A port mark and is kept to starboard when entering port.
(c) A starboard mark and is kept to port when entering port.
(d) A starboard mark and is kept to starboard when entering port.

Q 45 What direction of safe passage do each of the cardinal marks below indicate?

(i) 

(ii) 

(iii) 

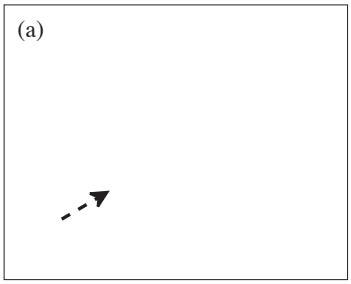
(iv) 

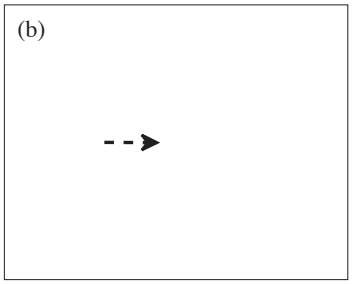
Q 46 Why is there a difference between true and magnetic bearings?

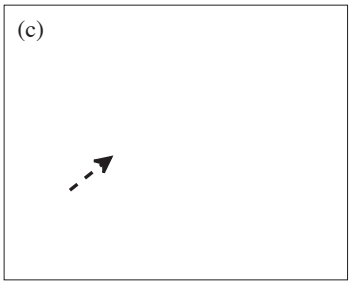
Q 47 In each diagram below, you are at the helm of the shaded vessel. For each case, state what you should do.

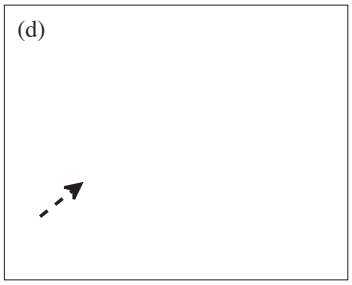
Note: The other vessel in the diagrams is:-

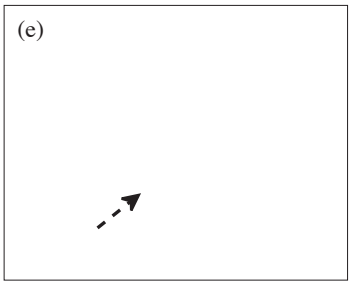
(a) Power boat
(b) Ferry
(c) Trawler
(d) Power boat
(e) Commercial Vessel
(f) Sailing Boat



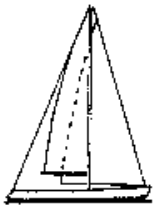


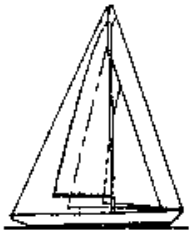


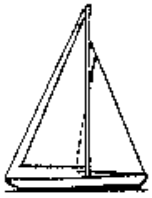




Q 48 Name the types of craft in the illustration below:-

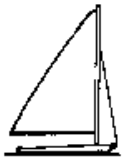
(a) 

(b) 

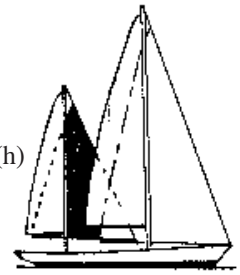
(c) 

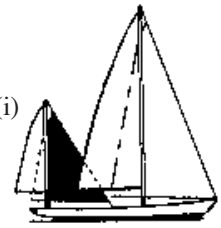
(d) 

(e) 

(f) 

(g) 

(h) 

(i) 

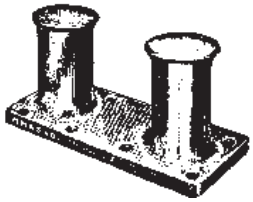
Q 49 Name the mooring types illustrated below indicating the correct use for each:-

(a) 

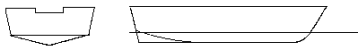
(b) 

(c) 

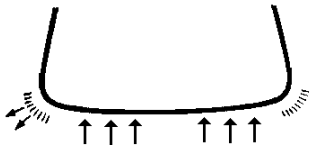
(d) 

(e) 

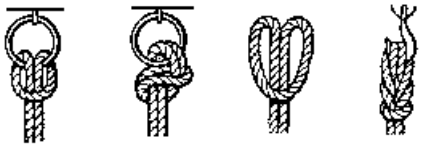
Q 50 Name the three hull shapes below indicating one advantage and disadvantage for each:-

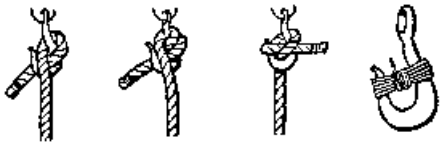
(a) 

(b) 

(c) 

The next two questions refer to the diagram below.

Group A 

Group B 

Group C 

Group D 

Q 51 Knots used to secure an end to a ring or hook are shown by group:-

(a) A only
(b) A and B
(c) C and D
(d) All groups

Q 52 The group of knots called wippings is illustrated by group:-

(a) A
(b) B
(c) C
(d) D

Q 53 The knot illustrated to the right is a:-

(a) Bowline.
(b) Reef knot.
(c) Sheep shank.
(d) Rolling hitch.

Q 53 The knot illustrated to the right is a:-

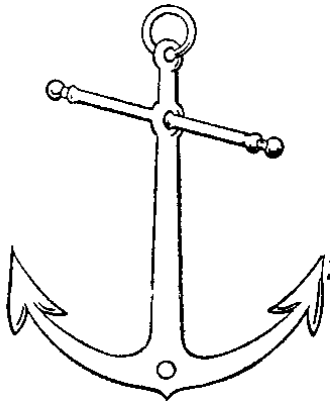
(a) Bowline.
(b) Reef knot.
(c) Sheep shank.
(d) Rolling hitch.

Q 53 The knot illustrated to the right is a:-

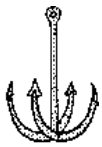
(a) Bowline.
(b) Reef knot.
(c) Sheep shank.
(d) Rolling hitch.

Q 54 Label the following parts on the diagram of the anchor below:-

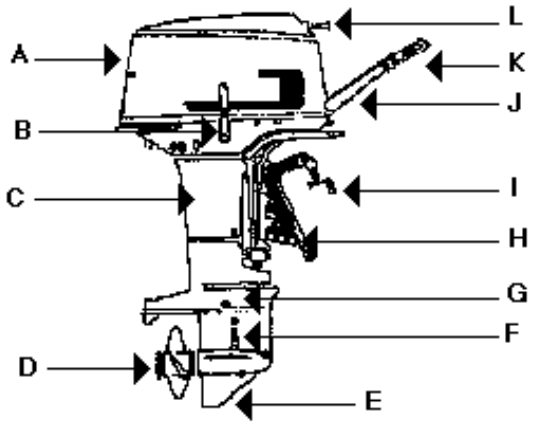
(a) Ring
(b) Stock
(c) Shank
(d) Crown
(e) Arm
(f) Fluke



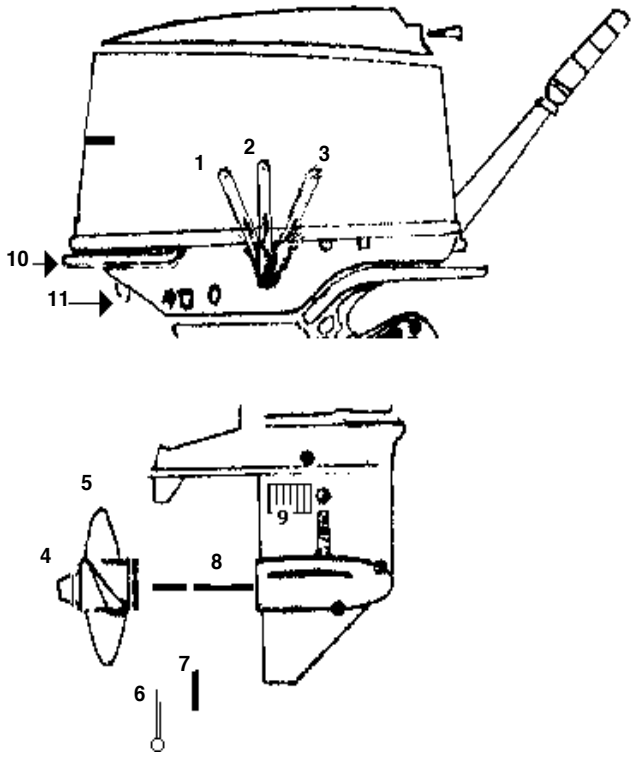
Q 55 What is the name of the anchor shown below and where should it be used?



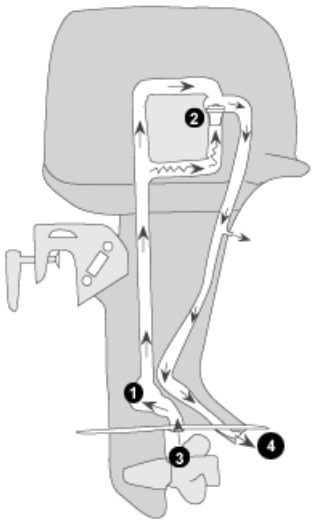
Q 56 Name the functions of the parts labelled A - L on the diagram below:-



Q 57 Name the parts 1 - 10 in the illustration below:-

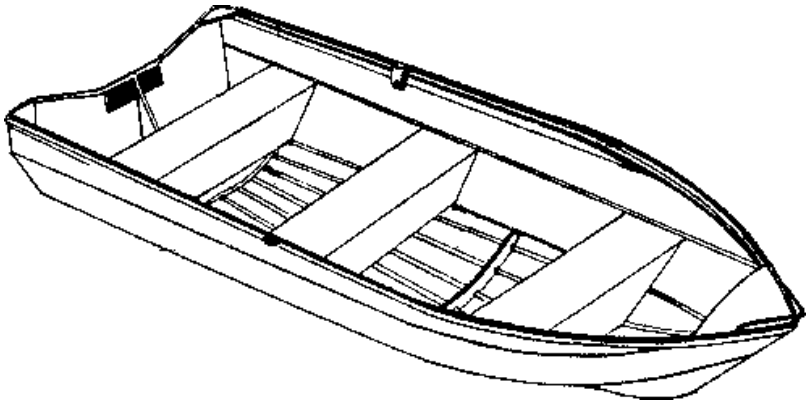


Q 58 Name the parts of the cooling system as labelled in the diagram 1 - 4 below and state their functions:-



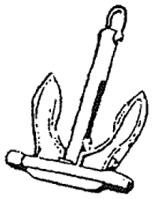
Q 59 In the blank boat illustration below mark in clearly:-

(a) Where and how the oars should be stowed.
(b) Where and how the fuel tank should be stowed.
(c) Where the boat registration sticker should go.
(d) Where the boat identification numbers should be placed.
(e) Where the painter should be spliced.
(f) Where lights should be fitted.
(g) Where regular maintenance checks should be made.

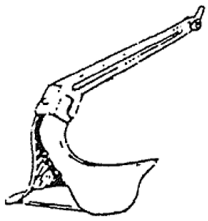


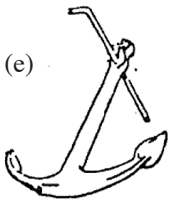
The next two questions refer to the diagrams below

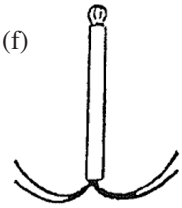
(a) 

(b) 

(c) 

(d) 

(e) 

(f) 

Q 60 Name each anchor pictured above.

Q 61 Select one anchor from the question above and write brief notes on its characteristics, advantages, and disadvantages.

Q 62 Define the following terms with respect to anchors:
RODE, SCOPE, CATENARY

Q 63 Describe, with the aid of a diagram, how you might anchor your craft to ride out a predicted heavy blow.

Q 64 Define the following terms with respect to ropes.
FAKE, FLEMISH

Q 65 Which type of rope possesses the greatest strength.

Q 66 Name the type of rope with the least degree of stretch.

Q 67 List the three classes of fire likely to be encountered aboard a vessel.

Q 68 Complete the table below.

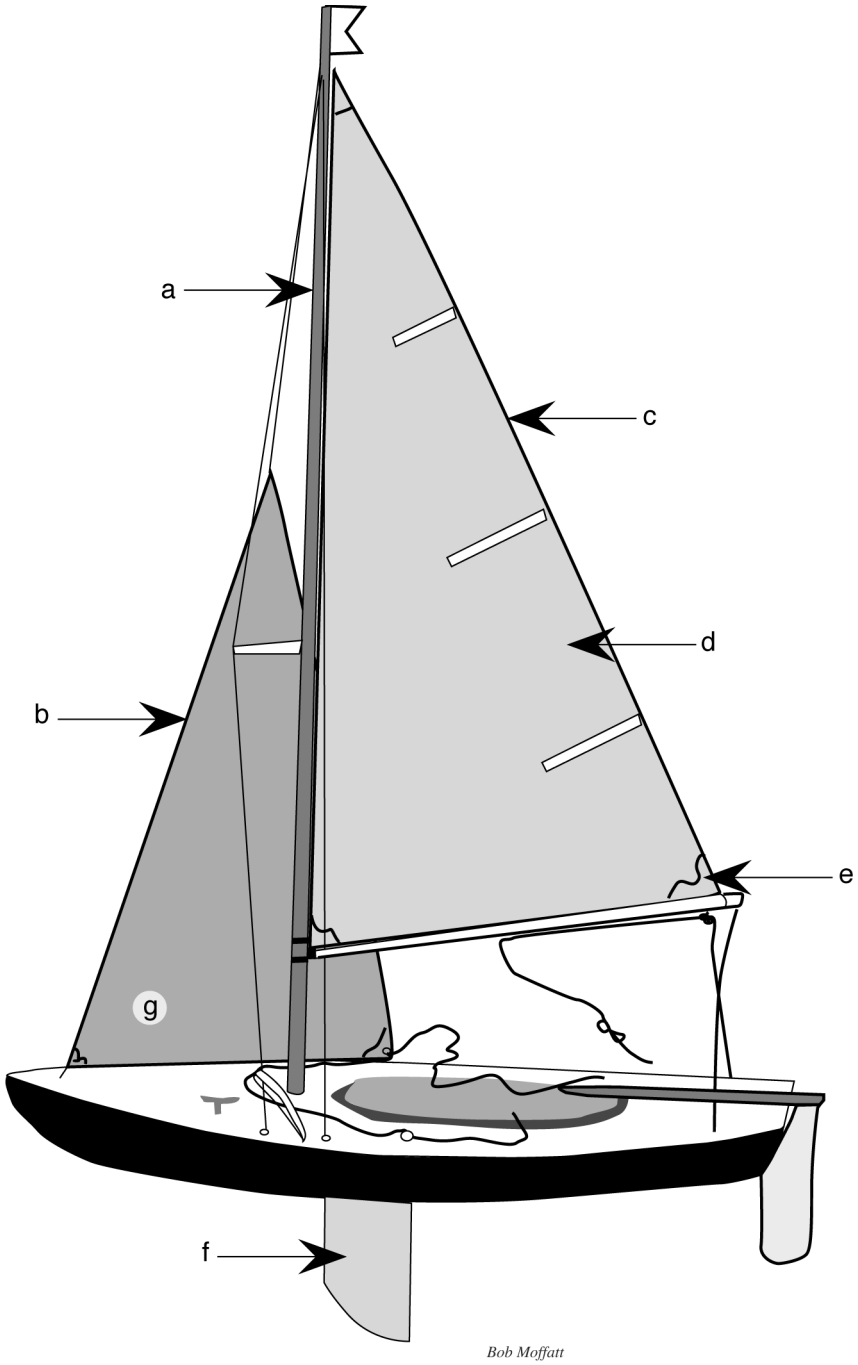
FIRE EXTINGUISHERS	(Most commonly used forms)
1. Water (A)	_____ _____ _____
2. Foam (B)	_____ _____ _____
3. _____	(B and C) Most efficient in an enclosed space. Cooling effect small and re-ignition possible. Used in built-in manual and automatic fire systems and fire in enclosed areas e.g. galley.
4. _____	(B and C) Especially effective against petroleum fires. Cooling effect small and re-ignition possible.
5. B.C.F. (A, B and C)	_____ _____ _____

Q 69 What are the two things you are trying to do to put out a fire?

Q 70 Use the tide tables to find the height and time of the tides at Mooloolaba for 8/11/89.

TIME	HEIGHT
_____	_____
_____	_____
_____	_____
_____	_____

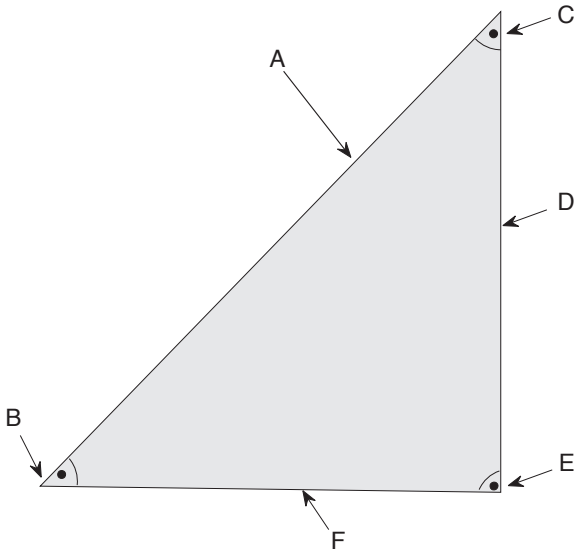
Q 71 Identify the parts A - L of the sailing boat below:-



Bob Moffatt

Q 72 Use the Tide Tables to calculate the amount of water above chart datum at Inskip Point at 1300 hrs this year.

Q 73 Name the parts labelled A to F below.



Q 74 Can any person other than a licensed driver, drive a speed boat engaged in water skiing activities?

(a) Yes, a person over the age of 12 years may drive a speed boat engaged in water skiing activities when under the direct supervision of a licenced driver on board that speed boat.

(b) Yes, a person over the age of 15 years may drive a speed boat engaged in water skiing activities when under the direct supervision of a licenced driver on board that speed boat.

(c) Yes, a person over the age of 16 years may drive a speed boat engaged in water skiing activities when under the direct supervision of a licenced driver on board that speed boat.

(d) No.

Q 75 How should your boat be marked?

(a) Registration numbers on both sides in figures 100 mm high, where they can clearly be seen.

(b) Registration numbers on the stern in figures 100 mm high, where they can clearly be seen.

(c) Registration numbers on both sides in figures 200 mm high, where they can clearly be seen.

(d) Registration numbers on the stern in figures 200 mm high, where they can clearly be seen.

Q 76 Which of the following is **incorrect?**

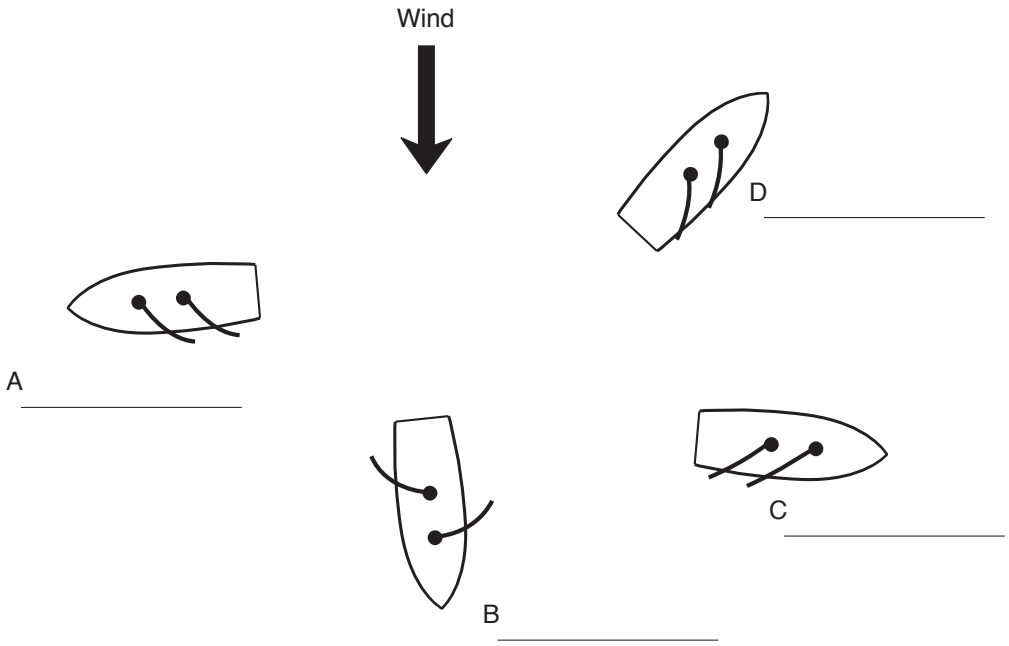
(a) A speed boat driver's licence is necessary to operate a boat engaged in water ski activities.

(b) An occupant is safely accommodated in a vessel when the occupant's body below the waist is enclosed within and below a safe railing, cockpit, coaming or bulwark.

(c) The driver, observer and one assistant may be carried when a speed boat is engaged in towing a water skier or skiers.

(d) Up to four water skiers may be towed at any one time.

Q 77 Which point of sailing are these sailing vessels on?



Q 78 When a sailing boat's bow is pointed too far into the wind, its sails are said to be _____.

Q 79 Name five possible means by which a sailing dinghy's direction through the water may be controlled.

Q 80 List the three basic hull shapes.

Q 81 What is the most efficient planing surface?

Q 82 How do hydroplane and cat hulls achieve lift?

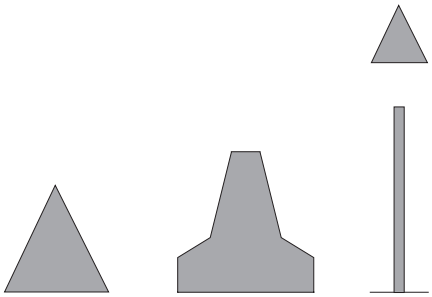
Q 83 Why is oil mixed with petrol for use in outboard motors?

Q 84 A boat has an outboard with power trim and tilt. The driver trims the motor up. What effect will this have on the boat's performance?

Q 85 Your motor is running and in forward gear but the boat is stationary. What is the problem and how could it be rectified?

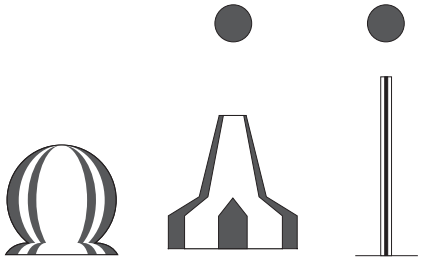
Q 86 You are sailing in the Sandy Straits on a Sabre 22' trailer sailer. You notice a squall approaching. What steps will you take with your craft to safely weather the storm?

Q 87 Which statement about the lateral mark shown here is true when approaching a harbour?



(a) It is green and should be kept to port.
(b) It is red and should be kept to port.
(c) It is green and should be kept to starboard.
(d) It is red and should be kept to starboard.

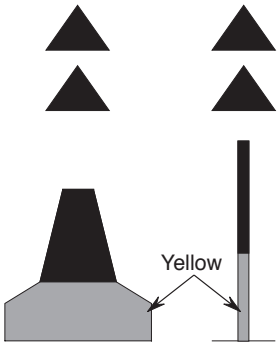
The next two questions refer to the diagram below



Q 88 The marks and buoys pictured here indicate:-
(a) Danger.
(b) Safe water.
(c) Traffic ahead.
(d) Water ski area.
(e) Anchorage here.

Q 89 The colours of these marks are usually:-
(a) Red and white.
(b) Yellow and black.
(c) Blue and yellow.
(d) Brown and green.

The next two questions refer to the diagram of the cardinal mark below



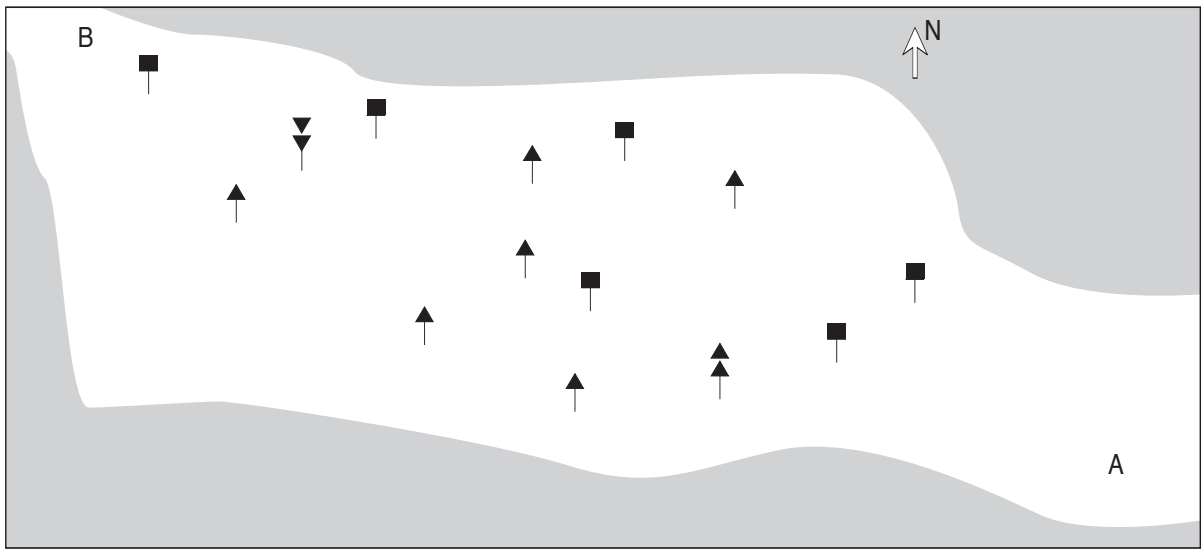
Q 90 The mark illustrated above is indicating that the safest water may be found in which direction from the mark?

(a) North.
(b) South.
(c) East.
(d) West.
(e) Directly below.

Q 91 How many flashes will the mark display at night ?

(a) Uninterrupted.
(b) 3 in a group.
(c) 6 in a group.
(d) 9 in a group. Continuous light.

Q 92 On the map below you wish to travel from point "A" to point "B". If you are leaving port, sketch in the path you would take.



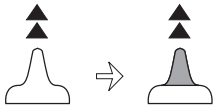
Q 93 What is the name of the marks pictured below?

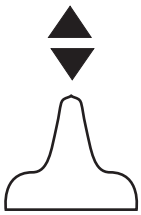
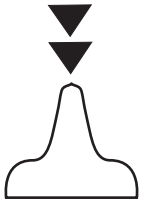
(i)  (ii) 

Q 94 A green lateral mark is a:-

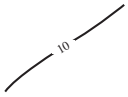
(a) Port mark and is kept to port when entering port.
(b) Port mark and is kept to starboard when entering port.
(c) Starboard mark and is kept to port when entering port.
(d) Starboard mark and is kept to starboard when entering port.

Q95 On the diagrams below, shade in the black areas on the base that correspond to the top marks shown. i.e.



(a)  (b) 

Q96 What are the names of the following chart symbols?

(a) 

(b) 

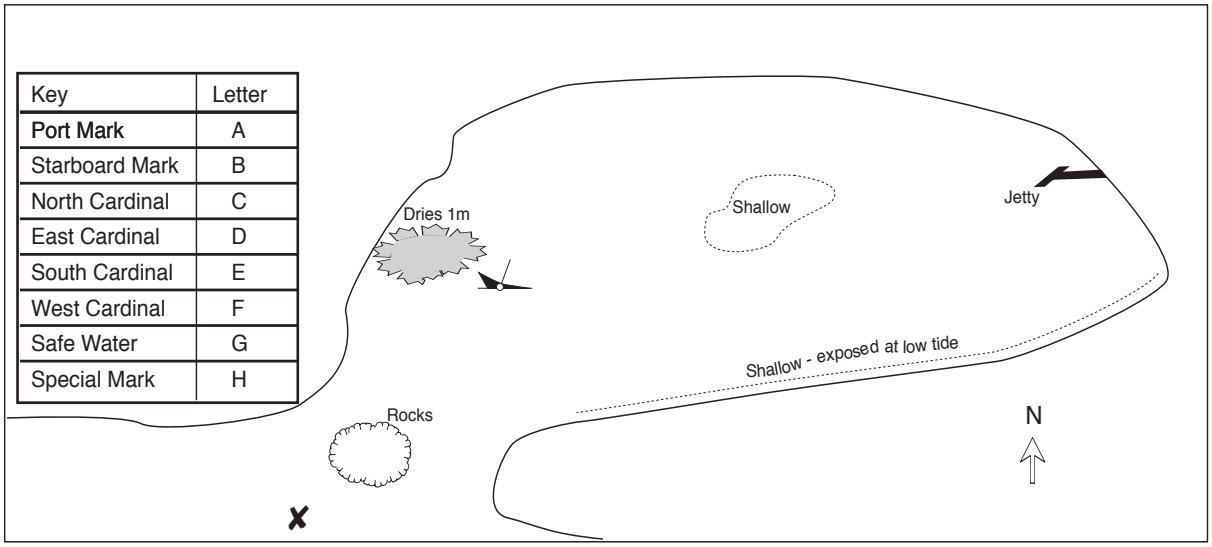
Q97 What is the difference between pilotage and navigation?

Q98 On the chart, what do the following symbols represent?

(a)

(b) 

The next question refers to the map below which shows the entry to a port, with its associated navigational hazards



Q 99 Using the key supplied, mark out a safe passage into the port from the point marked "X" (Note: use the letters corresponding to the marks chosen).

Q 100 The colour of an 'isolated danger' mark is:-

(a) Red and white vertical stripes.
(b) Black and red horizontal stripes.
(c) Black and yellow horizontal stripes.
(d) Totally red.

Q 101 The light sequence for an east cardinal mark is:-

(a) ****** ******
(b) **** *****
(c) *** *** ***
(d) ** ** ** **

Q 102 Navigation charts have a second "magnetic" arrow in the compass rose. Why is this?

Q 103 Mark the lights on the diagram below of a sailing boat below underway.

Q 104 How many degrees of longitude are there from Greenwich to the International Dateline?

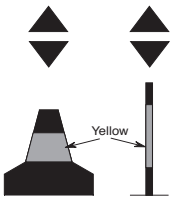
Q 105 Define the following terms:-

(a) Meridians.
(b) Variation.
(c) Deviation.

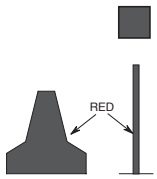
Q 106 The deviation of a compass varies from boat to boat. List factors which affect the compass.

Q 107 Place one of the words listed under each diagram or statement.

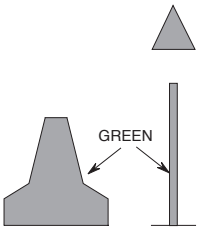
(a) Lateral.
(b) Cardinal.
(c) Isolated.
(d) Safe water.
(e) Special.



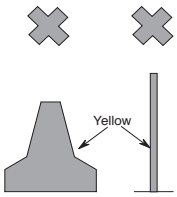
1. _____



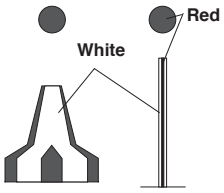
4. _____



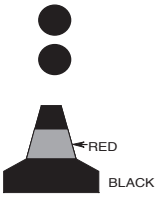
2. _____



5. _____



3. _____



6. _____

Q 108 Describe the difference between variation and deviation with respect to navigation.

Q 109 What is the difference between beacons and buoys?

Q 110 Describe the function of a fairway buoy.

Q 111 Explain the relationship between soundings on a chart and the depths given in a tide book.

Q 112 Through how may degrees of longitude does the Earth rotate in one hour?

Q 113 What is a speed of 1 knot equal to?

Q 114 Complete the sentence:-
The error in the chart caused by the movement of the Earth's magnetic field is called .....

Q 115 Complete the sentence:- The (very accurate) ship's clock is called the.....

Q 116 Complete the sentence:- On entering the port, the markers on the starboard side are coloured.....

Q 117 What lights are required by a power boat of less than 7 metres?

Q 118 Name four features found on a chart that would be found on a map.

Q 119 Complete the sentence:- Directions of passage may be indicated by cardinal marks or ..... marks.

Q 120 When giving co-ordinates of a position at sea, which value is given first?

Q 121 You are travelling in a motor sailer and intent on travelling 150 nautical miles non-stop. You travel at 18 knots for the first 6 hours under power. For the next ten hours you are under sail and moving at only 3.5 knots. Calculate the following:-
(a) How far you travelled in the first 9 hours.
(b) How far you travelled after 16 hours.
(c) The total distance remaining after 16 hours.
(d) How long before you arrive at your destination if you are travelling at 6 1/2 kn. for the remainder of the journey?

Q 122 How far can I travel in 12 hours if I am travelling at 7 knots?

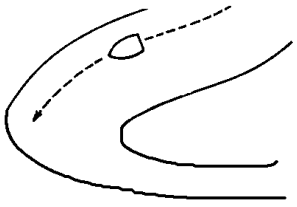
Q 123 For 3 hours I travel at 8 knots, and for the 2 hours after that I travel at 9 knots. How far have I travelled in 5 hours?

Q 124 If I set out in my speed boat at 6.30 am and reach my destination at 7.15 am after travelling 18 nautical miles, what was my average speed for the trip?

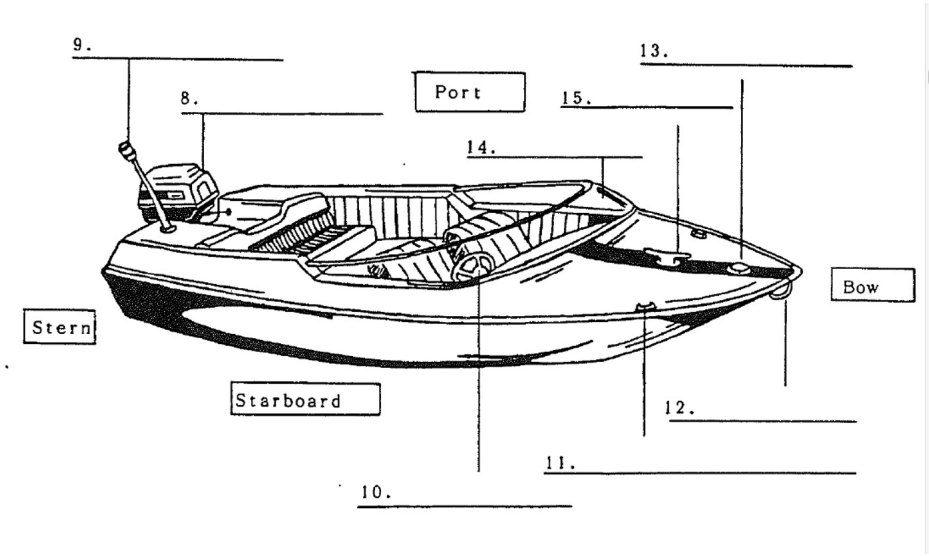
Q 125 You reach your first fishing spot after travelling for 40 minutes at 20 knots and wish to go onto another reef 10 nautical miles away. How long will it take at 20 knots?

Q 126 The boat in the diagram opposite is approaching a bend in the river and hears Tooooot.. Tooooot.

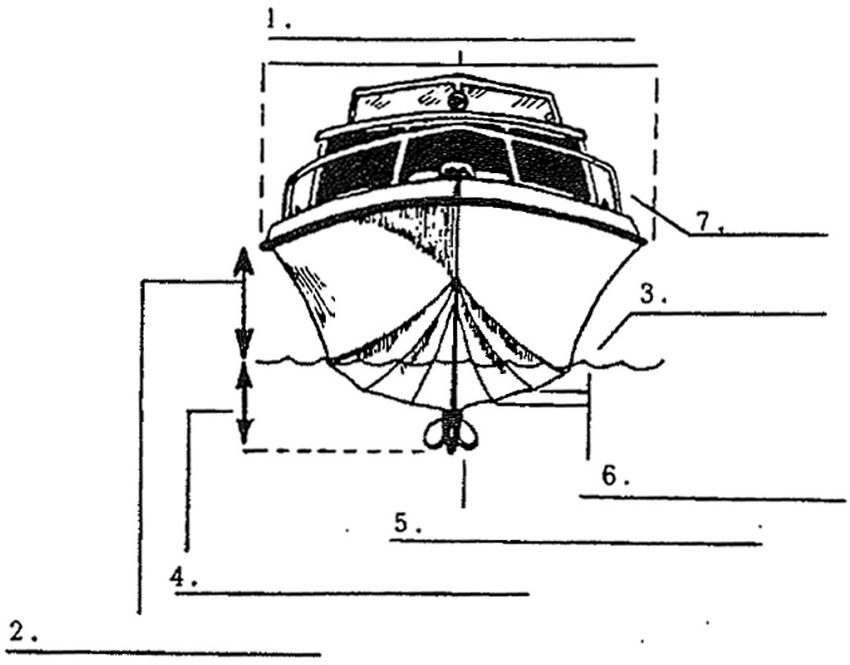
What action should the boat take?



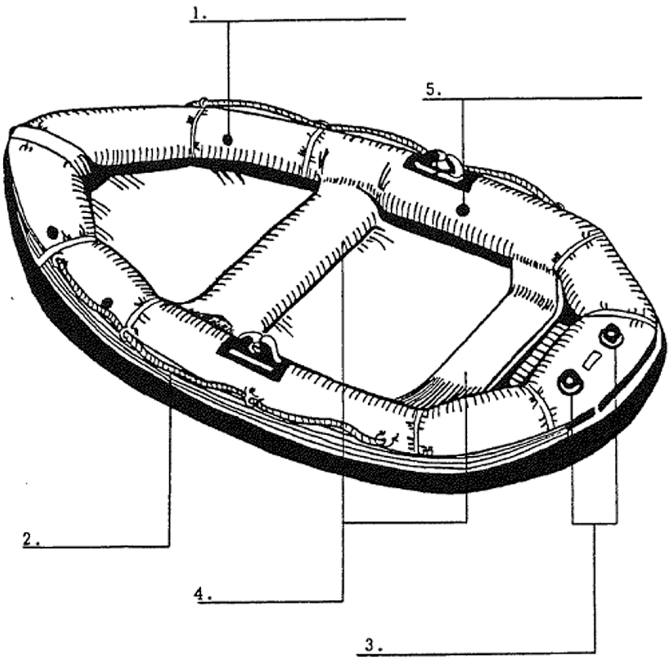
Q 127 Identify the number for the parts of the power boat labelled 1 - 7 below:-



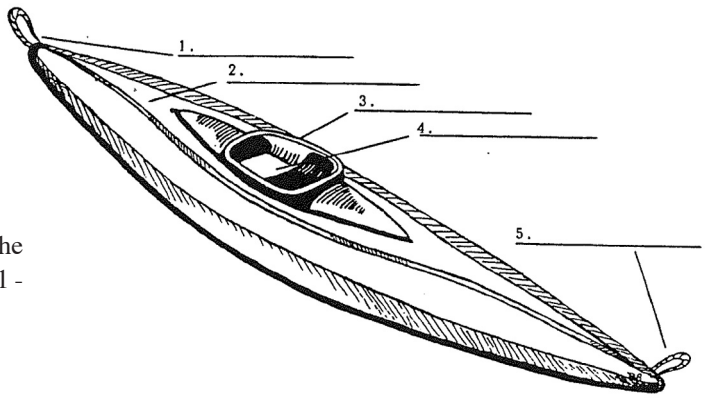
Q 128 Identify the number for the parts of the power boat labelled 1 - 15 below:-



Q 129 Identify the number for the parts of the life raft labelled 1 - 5 below:-



Q 130 Identify the number for the parts of the kayak labelled 1 - 5 opposite:-



Q 131 Discuss any five of the following terms as they apply to marine motors:-

(a) ADVANCE
(b) BOTTOM DEAD CENTRE
(c) CAMSHAFT
(d CARBURATION
(e) CHOKE
(f) COMBUSTION CHAMBER
(g) COMPRESSION
(h) CONNECTING ROD
(i) COOLING SYSTEM
(j) CRANKSHAFT
(k) CYLINDER BLOCK
(l) FLOAT SYSTEM
(m) PETROIL
(n) PORTS
(o) POWER HEAD
(p) SCAVENGING
(q) STROKE
(r) TOP DEAD CENTRE (T.D.C.)
(s) TWO STROKE CYCLE

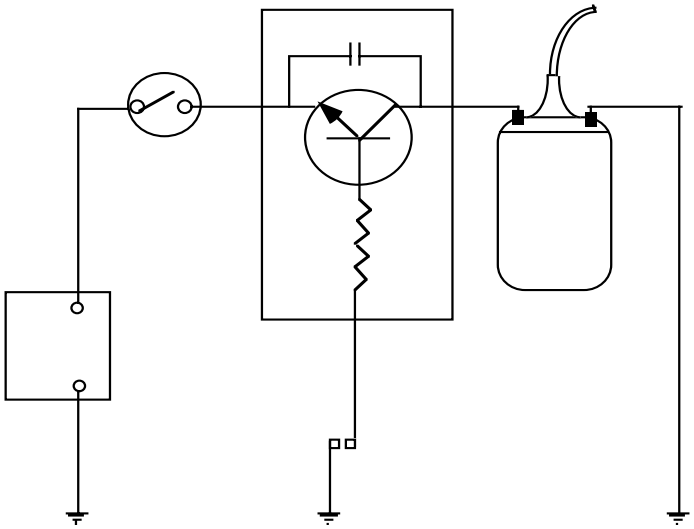
Q 132 The water tell-tale indicates that:-
(a) The water pump is operating.
(b) The thermostat is open.
(c) Water is circulating through the powerhead.
(d) All of the above are correct.

Q 133 To renew the waterpump impellor:-
(a) The cowling must be removed.
(b) The leg of the motor must be removed.
(c) The gear case must be removed.
(d) All of the above must be done.

Q 134 The fuel:oil ratio for most outboards is:-
(a) 100:1
(b) 80:1
(c) 50:1
(d) 20:1

Q 135 In the venturi system of the carburettor:-
(a) The air pressure is greater.
(b) Air pressure is released.
(c) Gas particles are squeezed closer together.
(d) Both (b) and (c) are correct.

The next two questions refer to the illustration below



Q 136 Mark clearly where each of the following components are located:-

(a) Transistor unit.
(b) Coil.
(c) Battery.
(d) Distributor points.
(e) Ignition switch.

Q 137 Describe briefly how each of the components (a) to (e) work.

Q 138 In an outboard gearcase, the gears:-

(a) Are in constant mesh all the time.
(b) Are locked onto the drive shaft.
(c) Are meshed to the drive shaft via the clutch.
(d) None of the above are correct.

Q 139 A very small leak in the fuel line will cause:-

(a) The motor to stop.
(b) The motor to starve at high speed.
(c) The fuel tank to drain.
(d) The primer bulb to collapse inwards.

Q 140 The function of the thermostat is to:-

(a) Open and close the passage through the cylinder water jackets.
(b) Cool down the motor.
(c) Pump water to the crankcase housing.
(d) Collect hot water from the powerhead.

Q 141 The pitch measurement of a propeller is the:-
(a) Tone at maximum revs.
(b) Distance that the boat will travel forward in one revolution of the propeller.
(c) Percentage slippage in still water.
(d) Theoretical distance the propeller will move forward in one revolution without slippage.

Q 142 If the gearcase oil is found to be milky in colour, it is likely that:-
(a) The wrong type of oil has been used previously
(b) The oil has not been changed soon enough and has deteriorated.
(c) Water is leaking into the gearcase from the waterpump.
(d) The propeller shaft seal is faulty.

Q 143 After running for a few minutes, an outboard motor stops. The operator notices that the primer bulb has collapsed. The cause is likely:-
(a) A blockage in the carburettor.
(b) The fuel tank breather cap is closed.
(c) A blockage in the fuel line between the primer bulb and the motor.
(d) No petrol is left in the fuel tank.

Q 144 If the points are incorrectly adjusted, this could cause:-
(a) Loss of power due to the magneto not supplying the correct voltage.
(b) The spark plugs to fire at the wrong time, resulting in loss of power.
(c) The mixture to be too rich, resulting in poor fuel economy.
(d) A reduction in the maximum possible revs, resulting in a reduced top speed.

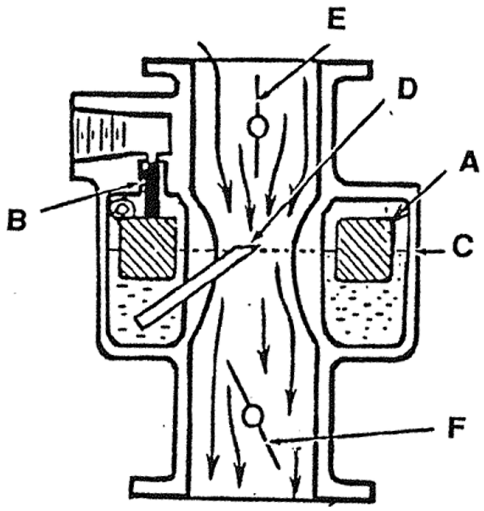
Q 145 The choke in the carburettor provides a rich fuel mixture for cold starting the engine by:-
(a) Closing off the intake air passage.
(b) Providing additional fuel to the main jet.
(c) Opening the reed valves, thus increasing the volume.
(d) Allowing an extra fuel passage to open.

Q 146 The propeller on a tug boat would need to have:-
(a) A large diameter, large pitch and large surface area.
(b) A large diameter, small pitch and large surface area.
(c) A small pitch, diameter and surface area.
(d) A small diameter, large pitch and large surface area.

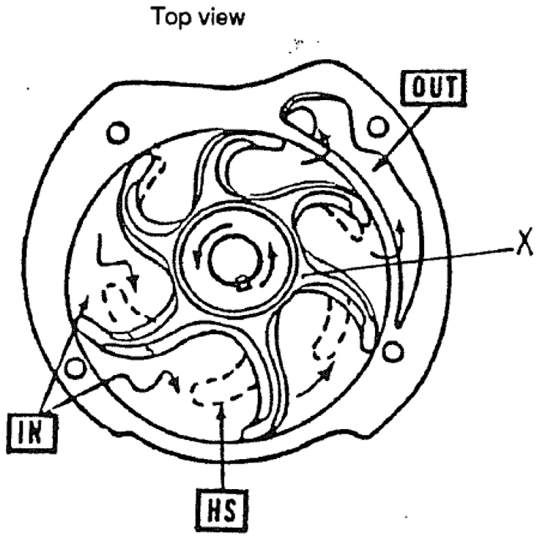
Q 147 Displacement hulls:-
(a) Sit deeper in the water than planing hulls.
(b) Are more suited to slow revving motors.
(c) Are more stable than planing hulls in rough water.
(d) All of the above.

Q 148 A person tries unsuccessfully to start an outboard and then removes the spark plug to check it. He finds the contacts are clean, correctly spaced, but they are wet. The problem is most likely to be:-
(a) A fault in the electrical system.
(b) A blocked carburettor jet.
(c) A fuel pump malfunction.
(d) Water leaking through the spark plug thread.

Q 149 Name the parts of the carburettor labelled A to E on the illustration below.



The next three questions refer to the diagram below



Q 150 This is a diagram of what part?

Q 151 Name the part labelled X.

Q 152 What is **incorrect** about the diagram?

PRAC EXAM CRITERIA SHEET IDEAS

Students Name ..... **Form** .....

Teacher .....

Skills

1. Ties a clove hitch.
2. Ties a round turn and two half hitches.
3. Ties a bowline.
4. Ties a figure of eight.
5. Ties a sheet bend.
6. Ties a reef knot.
7. Mixes two stroke fuels in a given ratio.
8. Coils and uses rope correctly on a trailer.
9. Rows a boat in a straight line.

(Using a boat with a 5 hp motor)

10. Mounts motor correctly and connects fuel tank.
11. Starts an outboard motor.
12. Uses gears correctly.
13. Reverses out.
14. Steers a boat with confidence at slow speed.
15. Brings boat back to shore correctly.

(Using a boat with a 5 hp motor)

16. Demonstrates 4 and 6 knots.
17. Demonstrates the boating rules.
18. Steers a boat with confidence on the plane.
19. Demonstrates turns while on the plane.
20. Demonstrates crossing the wash.
21. Demonstrate increase/decrease speed while turning.
22. Demonstrates reverse out and performs a figure of eight.

(Using a boat with a 5 hp motor)

23. Makes a figure of eight at speed.
24. Man over board drill.
25. Moors at a jetty or buoy.

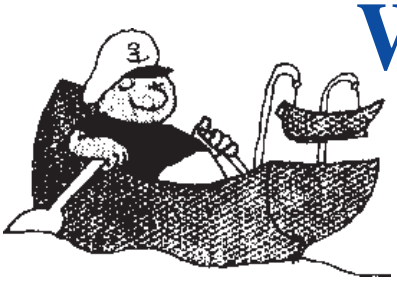
(Using a boat with a 15 hp motor)

26. Makes a figure of eight at speed.
27. Recover an object from the water.
28. Moors at a jetty or buoy.
29. Demonstrates the boating rules.

Topic 2

Exam questions

NAVIGATION
CHARTWORK
WEATHER
RADIO



Q1 On modern nautical charts depths or soundings are indicated as:-
(a) Feet.
(b) Fathoms.
(c) Metres.
(d) Nautical miles.

Q2 On modern nautical charts depths or soundings are measured from:-
(a) Low water datum.
(b) High water datum.
(c) Halfway between high and low water datum.
(d) A special mark in Greenwich, London.

Q 3 The position of an object on the earth's surface is given by its latitude and then its longitudes. A latitude (0^0) begins at:-
(a) The Equator.
(b) The Greenwich meridian.
(c) A line through Brisbane.
(d) The North Pole.

Q 4 You are positioned at Town at 152^0 E longitude. It is 8.00am. What will be the time at 122^0 E longitude?
(a) 6.00 am.
(b) 10.00pm.
(c) 12.00 midnight.
(d) 9.00 am.

Q 5 Which of the following statements is **correct** about the modern depth sounder:-
(a) A transducer fitted to the bottom of the boat transmits an electronic pulse which bounces off the sea bed and is picked up by a small receiver in the command centre.
(b) Radio waves are used to measure the depth of the sea under the keel.
(c) By measuring the time of transmission of sound waves to receiving , the sounder records the depth of water under the keel.
(d) All of the above are correct.

Q6 On Mercator charts, the major distortion is at:-
(a) The poles.
(b) The tropics.
(c) The Equator.
(d) The great circle.

Q7 On a chart, the Longitude (0^0) begins at:-
(a) The Equator.
(b) The Greenwich meridian.
(c) A line through Brisbane.
(d) New York.

Q 8 The latitude of a position is:-
(a) Its distance from Greenwich.
(b) The angular distance north or south of the Equator.
(c) Its distance from the international date line.

Q 9 A magnetic compass indicates:-
(a) True north.
(b) Magnetic north.
(c) A position of the vessel.
(d) Variation.

Q 10 The factors including current eddies, tidal flow and even bad steering which can push a boat off its course are known as:-
(a) Set and drift.
(b) Gyroscopic error.
(c) Deviation.
(d) None of the above.

Q 11 On a chart, the Latitude scale:-
(a) Begins at the Equator (0^0) and runs (180^0) west and east.
(b) Begins at the Equator (0^0) and runs (90^0) south and north.
(c) Begins at the Equator (0^0) and runs (180^o) south and north.
(d) Is measured in kilometres and runs east and west.

Q 12 On modern charts, distance is measured in:-
(a) Kilometres.
(b) Miles.
(c) Nautical miles.
(d) Cables.

Q13 Speed at sea is measured in:-
(a) Kilometres.
(b) Miles per minute.
(c) Feet per second.
(d) Knots.

Q 14 A nautical mile is equal to:-
(a) Two kilometres.
(b) 1 minute of latitude.
(c) 1 minute of longitude.
(d) 1 degree of longitude.

Q 15 Deviation:-
(a) Is the distance a boat is blown off course by wind.
(d) Is an error in the functioning of a hand bearing compass.
(c) Is a fixed value which can be calculated annually.
(d) Depends on the direction the boat is heading.

Q 16 Leeway is the effect on a ship's course created by:-
(a) Wind.
(b) Set and drift.
(c) The ship's magnetic field.
(d) Wave action.

Q 17 Which of the following statements about radar is **incorrect?**
(a) Radar works on a similar principle to the depth sounder; an electronic pulse is transmitted from the scanner.
(b) The pulse bounces back off the shore or other objects in the vicinity and the "echo" is picked up by the receiver.
(c) As the scanner rotates through 360^0 these echoes are converted into a map like a picture on cathode ray tubes with the boat as the centre of the screen.
(d) The set also incorporates means of measuring latitude and longitude through a new transducer system.

Q 18 Which of the following would not be considered a navigation instrument?
(a) Sextant.
(b) Chronometer.
(c) Barometer.
(d) Radar.

Q 19 Magnetic variation is:-
(a) The effect on a compass due to metal objects in the boat.
(b) Caused by an error in " swinging " the compass.
(c) The number of degrees the earth's magnetic field differs from geographic north.
(d) Influenced by the direction the boat is travelling.

Q 20 In nautical terms a 'cocked hat' is:-
(a) Your exact position after two bearings have been taken.
(b) A triangle resulting from the non-intersection of three bearings plotted on a chart.
(c) Another name for a north cardinal mark.
(d) The area between three objects used to take bearings.

Q 21 The 'lubber line' is:-
(a) A knotted rope used to determine speed in olden days.
(d) The line on the side of a boat which corresponds to the waterline when the boat is fully laden.
(c) The mark on a compass indicating the ship's head.
(d) The most direct course back to land from a point at sea.

Q 22 One degree of latitude is equal to:-
(a) 60 seconds. (b) 60 minutes.
(c) 100 minutes. (d) One kilometre over water.

Q23 A certain craft has a maximum speed of 25kn. How long will it take to complete a passage of 60 nautical miles in ideal conditions?

Q24 What is neant by a sectored section of a light from a lighthouse?

The following questions are on position fixing

Q 25 One vessel gives its position as $24^0$55'S $153^0$45'E. Another vessel gives its position as $26^0$00's $153^0$40'E. How far apart are they in nautical miles?

Q 26 You are somewhere on 45^0E. It is 0900. What is the time on:-
(a) 75^0E?
(b) 30^0E?
(c) 50^0E

Q 27 What is the distance from the Equator to the South Pole in nautical miles?

Q 28 One vessel gives its position as 22° 15'00"N. 155^0 45"00"E.
Another vessel gives its position as 17° 15'"00"N . 155 45'00"E. How far apart are they in nautical miles?

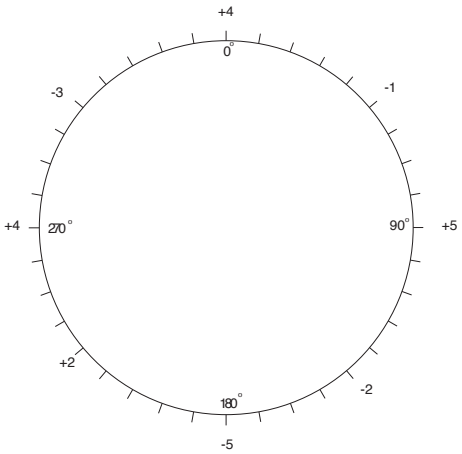
The following Question refers to the Noosa Chart

Q 29 What is the position of :-
(a) Rainbow Beach
(b) Round Mt.
(c) Noosa Heads.

Q 30 If you were to take a bearing from Rainbow Beach to Mt. Coondoo:-
(a) What is the magnetic bearing?
(b) What is the true bearing?

Q 31 Using this ' deviation card' shown calculate the TRUE course if the:
(a) compass course 90^0
(b) 260^0

Variation is 10^0E (show working).



Q 32 Locate your position if your true bearing is 340^0 to the Cherry Venture wreck 250° to Noosa Heads.

Q 33 A vessel is travelling from Noosa Heads to fishing grounds positioned latitude 26^0 20'S longitude $153^0$20'E. The vessel is travelling at a speed of 6 knots. Calculate the direction you need to travel allowing for set and drift. How long will the trip take? Calculate the compass course required using the deviation card shown above.

Q 34 Refer to the chart showing part of the North Coast and calculate the latitude and longitude of:-
(i) the " Cherry Venture" wreck
(ii) Laguna Hill.

From the chart of the Noosa Coast provided:-

Q 35 Calculate the distance between NOOSA HEADS and DOUBLE ISLAND POINT.

Q 36 Calculate the true bearing of DOUBLE ISLAND POINT from NOOSA HARBOUR ENTRANCE.

Q 37 Calculate the magnetic compass bearing you would navigate by to travel from NOOSA HARBOUR to DOUBLE ISLAND POINT in fog.

Q 38 RAINBOW BEACH to WOLFE ROCK, how far?

Q 39 The distance in nautical miles from a boat at X to NOOSA HARBOUR.

Q 40 The compass bearing you would have to steer by to reach the harbour.

Q 41 The time taken to reach the harbour travelling at 10 knots.

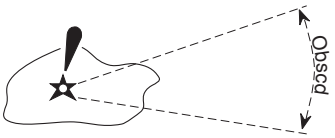
Q 42 You are off shore from the Cooloola coast, and take the following bearings using your hand bearing compass: Double Island Point light 345^0 M. Mt. Coondoo 252^0 M and Mt. Bilewilam 304^0. Use this information to plot your position on the chart.

Q 43 What is the magnetic variation for the chart given in 1991?

Q 44 Describe what the following chart symbols mean:

(a) _____

(b)  F1.5S 85m 11M

(c) 

Q 45 Complete the sentence:-

If I set a course of 70 degrees on the chart I would need to steer a compass bearing of .....if the variation is 7^0 30'E.

Q 46 What is the date of the chart and what is the magnetic variation for this year?

Q 47 What is the true bearing from the Gneering Shoals to Pt Cartwright?

Q 48 Name any three conspicuous landmarks on the chart.

These questions refer to charts of the Capricorn Coast.

Q 49 Refer to the given chart Aus 819: explain what is meant by the symbols F1(3) 12s 52m 8M. as they apply to the lighthouse on Great Keppel Island.

Q 50 Give the latitude and longitude of

(a) The Child
(b) Wedge Island.

Q 51 A yachtsman gives his position as 22^0 51^0S 151^0 3'E. Plot his position on the chart.

Q 52 A yachtsman is anchored 1/2 Nm north of the red beacon at Rosslyn Bay.
He plots a course to take him south of Sloping Island, to a point which he calculates using these transit bearings:-

(i) The lighthouse on Great Keppel, and Man and Wife Rocks.
(ii) The top of Corroboree Island, with the northern end of Outer Rock.

This journey will commence an hour after low tide, and the yachtsman will average 6 knots. Allowing for a 1 1/2 knot tidal flow, what course will he steer?

Q 53 From the transit point in the question above, he lays off a course of 343^0 true. About 2 hours into this leg he does a position check by taking the following bearings:

(i) Stockyard Point 297^0M
(ii) Water Park Point 239^0M
(iii) 129m peak on North Keppel Island 173^0M
(iv) Plot his true position.

Q 54 If this error has been caused by an easterly wind, how many degrees of leeway is that?

Q 55 Study the information given in Chart 819 regarding the C. Capricorn light . Then describe what you can about the light's characteristics e.g.. height above sea level, visibility, flash patterns etc.

Q 56 Describe the light at 23^0 10'S 151^0E

Q 57 Name any three conspicuous chart features.

Q 58 Lay off a course on chart 819 to take you from the jetty at Emu Park, north about Pelican Island, to an anchorage 2Nm due west of C. Capricorn light. This voyage will commence at an hour after low tide, and you will average 7 knots for your journey.

The course to steer should allow for variation, deviation and the tidal flow.

These questions refer to chart extract 819

Q 59 What is your position if C. Capricorn bears 206°M and the north end of Hummocky Is. bears 284^0 M? Lay off the bearings and mark your position.

Q 60 Your position is given as being on the 20m line with the top of Barren Island bearing 022^{0}M. Mark your position on the chart.

Q 61 Study the information given in Chart 819 regarding the C. Capricorn light. Now describe what you can about the light's characteristics e.g.. Height above sea level, visibility etc.

Q 62 Describe the light at 23^{0}10'S 151^{0}E.

Q 63 Give the latitude and longitude of:-
(a) Emu Point.
(b) Arch Rock.
(c) The fairway buoy at the mouth of the Fitzroy River.

Q 64 A Yachtmaster gives his position as 23^0 15 1/2's 151^0 08'E. Plot his position on the chart.

Q 65 Lay off a course on chart 819 to take you from the jetty at Emu Park, north about Pelican Island, to an anchorage 2Nm due west of C. Capricorn light. This voyage will commence at an hour after low tide, and you will average 7 knots for your journey. The course to steer should allow for variation, deviation and tidal flow.

Q 66 A yachtsman fixes his position using 3 bearings as follows:-
(i) Southern end of Humpy Is ..... 267^0 M
(ii) Eastern end of Barren Is .... 003^0 M
(iii) Light house on the eastern end of Gt Keppel .... 299^0 M.

Plot his position.

Q 67 You have broken down in calm seas and give your position as at anchor on the 15m line: with Monkey Point on Gt Keppel Is. and the Western end of Humpy Is. in transit, approximately a mile off the island. Plot your position on the chart.

Q 68 You are at anchor 1Nm east of Girt Is. Lay off a course to take you to the western end of Miall Is. Each leg should allow for variation, deviation and an incoming tide,
(i) What is the total distance travelled?
(ii) Given a speed of 6kn , how long will the journey take?

Q 69 Your position is 1Nm north of the wreck on Hummocky Is. What course will you steer to take to travel around Double Head and into Rosslyn Bay, assuming that you leave a 1/2 hour after low tide and you travel at 7 knots?

Q 70 Given that an easterly wind is blowing creating a leeway of 4^0, what will be the course to steer, allowing for the effect of leeway?

The following questions refer to the chart of Pt. Douglas

Q 71 You plan to journey from Island Point (Pt. Douglas) to Pixie Reef.

(a) How far is the journey?
(b) Travelling at approximately 12 knots, how long would you expect to take?
(c) If your vessel was 20L/hr at 12 knots what is the safe minimum amount of fuel needed for the journey?
(d) After 40min, Egmont Beacon is 262^0 magnetic and Low Isle lighthouse is 339^0 magnetic. Give latitude and longitude.
(e) What should be new heading to Pixie Reef?
(f) After another 40min, the middle of Double Island is 188^0 magnetic and Low Island lighthouse as 308^0 magnetic. What is your position?
(g) What should be your new heading to Pixie Reef?
(h) Give transit bearings for Pixie Reef.
(i) From Pixie Reef you decide that you would like to try the fishing at the unnamed Reef at 16^0 32'50"S and 145^0 57'0"E. Do you have the fuel for this extra trip? Explain.
(j) What magnetic bearing should you take from Pixie to the unnamed Reef?
(k) On your return from this unnamed Reef you are heading straight for Island Point and your compass reads 280^0. What is your deviation?

The following questions refer to Cape Hillsborogh chart

Q 72 At 0 900 our boat is in a position latitude 20^0 36.8's longitude 149^0 03.7 E heading into the Whitsunday Passage. Our destination is the resort on Hamilton Island and we plot our arrival position 1.6 miles due south, of Dent Is light. What will be the compass course to steer allowing for 6^0 of leeway from an easterly wind?

Q 73 If my boat makes a steady 6 knots what time will Platypus Rk. be abeam to starboard?

Q 74 A fix at 1030 establishes the boat's position due east of Round Hd. 3 miles off the shore. What set has been experienced since 0900 and what course will we now steer to arrive at our original arrival position.

Q 75 What will be our ETA at the arrival position taking into consideration the effect of the set?

Q 76 You are to sail between Goldsmith Is (627^0) and Brampton Is (323^0). The set of the current is in the direction of 210^0T and drift is 2kts. Boat speed is 3 kts. Find the compass course to steer.

Q 77 You are to sail between Rabbit Is and Allonby Is. The set of the current is the direction of 300^0T and drift is 2.5 kts. Boat speed is 5kts. Find the compass course to steer.

Q 78 Using the Running Fix method to determine the actual position of a course line having a bearing of 90 ^{0}T using East Repulse (212)., 050 ^{0}T., Log reading 145Nm and then the same point at 320^0Y. Log reading 146.5Nm.

Q 79 Using the Running Fix method determine the actual position of a course line having a bearing of 300 T using Silvermith Is (253). 330^0T., Log reading 143Nm and then the same point at 50 ^{0}T., Log reading 144.4 Nm.

These Questions Refer to chart 5169A

Q 80 We are at anchor near Platypus Rk which is just west of the south west tip of Shaw Island. Low water is at 0600 and at that time our depth sounder gives a reading of 25 metres. Our transducer depth is at 3 metres and according to the tide tables, 0600 low water is 1 metre.

(a) What is the latitude and longitude of our boat's position? Variation calculated as for 1990.
(b) The wind is **due East.** What will be the compass bearing of Dent Island light from our anchorage position assuming you could see it.
(c) At 0800 we set course for Pine Hd, the 12 fathom mark on the south western corner. What will be the compass bearing taking into account the wind is blowing due east creating a leeway of 7^0?
(d) A fix at 0930 establishes the boat's position 2 miles due east of Round Hd. What set has been experienced since 0800, and what course will we now steer to reach our original arrival position ? What will our ETA be at our original arrival position?

All questions refer to Chart 829 (show all working)

Q 81 You have decided to take your speed boat on a fishing trip. If the weather is good you will go to the reef, Goudge Bank, (11_5). Your plan is to leave the Mourilyan Harbour light QK. F1. 6M at 6 am and travel to a fishing spot marked, (18_3), B east of Kent Island. If the boat uses **20** litres/hour at an average speed of 25 knots calculate the following:

(a) The total distance to Goudge Bank, (11_5) area via Kent Island, B (18_3) fishing spot.
(b) If you fish 1 hour at Kent Island and then decide to go to Goudge Bank (11_5) A, what is your estimated time of arrival at Goudge Bank (11_5)?
(c) How much fuel would you use on the journey out to Goudge Bank including the trip from the harbour?
(d) What compass bearing will I travel on to reach my fishing spot B of sounding (18_3) near Kent Island?
(e) The weather is good and I decide to travel out to the reef and fish Goudge Bank A of sounding (11_5). What bearing will I travel on?

The tides for the day of my fishing trip are:

Time	Ht
0531	1.88m
1149	.90m
1705	1.51m
2332	.57m

(f) What depth of water will my sounder show when I first reach Goudge Bank, A (11_5)?

Q 82 What is the change in Latitude from Brook Island to Russell Island?
Brook Is _____
Russell Is _____

CHART:- BUNKER GROUP TO HERVEY BAY

Q 83 Name the object at 240^0 32.5'S 152^0 12'E.

Q 84 Calculate the magnetic variation for the southern compass rose in 1980, to the nearest half degree.

Q 85 Calculate the compass course to steer from Rooney Point ($24^0$49'S, $153^0$7'E) to South Head Light ($24^0$46S,152^0 24'E) using the deviation table on the chart.

Q 86 What is the distance from Rooney Point to South Head light?

Q 87 Calculate the time you would expect to arrive at South Head Light if you travelled at 10 knots and left at 1000 hours.

Q 88 At 1100 hours you take the following bearings
Rooney Point 104^0 T
Sandy Cape Light (24^0 44'S 153^0 13'E) 78^0T

(a) Calculate the set of the current

(b) Calculate the drift of the current

(c) What is the nature of the bottom?

Q 89 Allowing for the set and drift what is your new true course to steer for South Head Light?

Q 90 What is your new ETA at South Head Light, allowing for set and drift?

Q 91 If high tide occurred at 0900, what is likely to happen to the current as you approach South Head Light?

Q 92 A compass bearing reads 93^0 magnetic. If the variation is 11^0 E, what is the true bearing?

Q 93 If the true bearing is 352^0 T, what would the compass read for a variation of 12^0 W?

Q 94 A compass rose contains the following information:

= Magnetic variation 8^0 E (1979) =
= =
= Increasing 3' annually =

What is the present magnetic variation?

The following questions relate to the accompanying chart of Hypothetical Bay

From the Book
Classroom Navigation
Wet Paper Publications

Q 95 What are the co-ordinates of the water tower?

Q 96 What is the distance between the Fairway Beacon and North Reef Light?

Q 97 How long would it take to travel between these two points at an average speed of 10 knots?

Q 98 What direction is Susan's light from Tony's Light?

A boat under way in Hypothetical Bay takes three compass bearings to determine its position.

The bearings taken are as follows:-	
Marks Light	247^0 compass
North Reef Light	353^0 compass
Derek's Light	102^0 compass

Q 99 Knowing that the deviation is 2^0W for the current ship's head plot the position of the boat on your chart of Hypothetical Bay (assume the year is 1979).

Q 100 A boat completes three legs of a fishing trip. On the first leg of 6 Nm the average speed is 5 knots, on the second leg, 15Nm, the average speed is 8 knots.

(a) How long will it take to complete the whole trip?
(b) What is the average speed of the boat over the whole trip?
(c) How much fuel will be needed if the motor uses 0.5 litres per nautical mile?

Q 101 Find the compass bearing when:-

(a) Variation = 10^0 W, Deviation = 3^0W , True bearing = 045^0
(b) Variation =12^0E, Deviation = 4^0 W , True bearing = 359^0

Q 102 What is the latitude and longitude of the following?

(a) Claridgeville Fishing Club.
(b) Susan's Light.
(c) Mark's Light.
(d) Gregory River Light.
(e) The Fairway Buoy.

Assignment
Time 4 weeks, Chart 5169A

Q 103 You intend going on a cruise in your motor sailer and plan to travel 160 miles non-stop. For the first 8 hours you travel at 8 knots under power. For the next 10 hours you hoist sail and travel at 4 knots. Calculate the following:- (Show all working step by step.)

1 How far you travelled in the first 8 hours
2 How far you travelled after 18 hours
3 The total distance remaining
4 How long before you arrive at your destination if the wind picks up after 18 hours and you sail at 6 knots.

Q 104 All calculations to be done for the year 1990. You are positioned at latitude 20 ^{0} 35.2's longitude 158^{0} 53'E and plan to travel to a position 2 miles due east of Platypus rock.

Calculate the following:-

1 What compass bearing would you steer by?
2 How long would the journey take travelling at 16 knots
3 How much fuel would I use if my motor sailer consumes 10 litres per hour?
4 What is the position of my destination 2 miles east of Platypus Rock?

Q 105 Having reached your destination 2 miles due east of Platypus Rock you take a bearing using a hand compass on the light on Dent Is of 344^{0} 326. Calculate the following:-

1 What will be the true course to steer to reach a destination 5 Nm due south of the southern tip of Dent Is?
2 What will your position be, when you reach your destination?
3 What does Fl.21 sec 120ft 16M mean?

Q 106 You have travelled from your change of bearing position for 1 hour (boat speed 6 knots) at which time you take 3 bearing fixes as you suspect you may be off course.

Bearing:-

1 To Round Hd eastern tip 226^{0}M
2 Dent Is light 003^{0}M
3 The middle of Cole Is. 100^{0}M.

Calculate:-

1 Your fixed position
2 Suggest 2 reasons why you are not where you are supposed to be.

You are to plan an ocean cruise in the Hillsborough Channel area N/E of Mackay, to be of at least 3 days duration, Your starting point is 1 Nm south of Cape Hillsborough.

Leg 1: will take you west of Repulse Bay, south of C. Conway, to and anchorage in Kennedy Sound
Leg 2: Kennedy Sound to Goldsmith Island
Leg 3: Goldsmith to Brampton
Leg 4: Brampton to St Bees
Leg 5: St Bees return to Cape Hillsborough.

Your plan should include details of the vessel, crew, fuel, victualling , course, distances and anchorage chosen.

Year 11 Marine Studies
Navigation Assignment -- Hypothetical Bay
Topic 1

Time Allowed 1.5 Hrs To be completed in class time
Reference: Classroom Navigation
Wet Paper Publications

Q1 Give the co-ordinates of North Reef Light. Could any other features have these coordinates? Explain.

Q2 Name the feature at approximately 23^0 56'S 156^0 56'E.

Q3 Determine the distance from North Reef Light to Susan's Light. Explain how you did this.

Q4 What is the shortest safe navigable distance for a boat with a 4m draft between North Reef Light and John's Light? Show your working.

Q 5 Plot a course on your chart from north Reef Light to Kev's Light rounding the eastern side of Gillies Island.

(a) Draw up a table similar to the one shown below and complete each column for every leg of the trip.

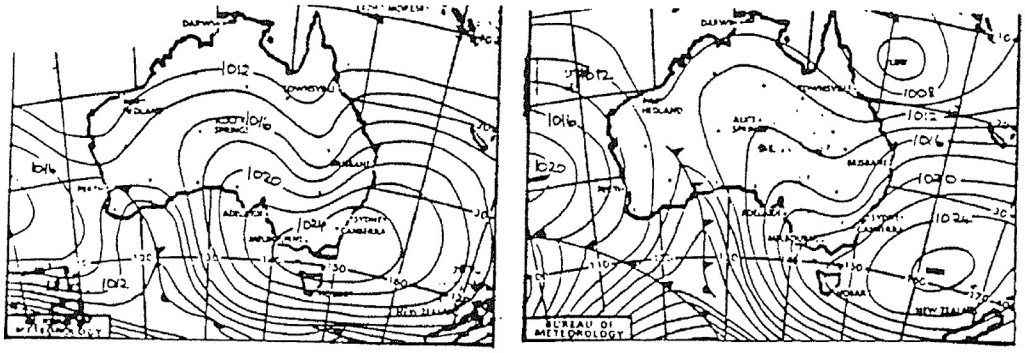
Leg N^0	True Bearing	Variation	Magnetic Bearing	Deviation	Compass Error	Compass Error

Q6 How long will the journey take at a boat speed of 6 Knots? Show your calculations.

Q7 If the tidal range is 3m and low tide is at noon, at what time would a boat with 4m draft be able to tie up at Gregory River Light? Explain and show your calculations.

The next two questions refer to the information and weather maps below.

You are intending to go fishing 50 Nm. out to sea from your local harbour or estuary. The figure below shows 2 weather maps from the days immediately prior to your intended trip.



2 days before **1 day before**

Q 107 Sketch the weather map you would predict for your intended day of departure.

Q 108 In view of the weather trends on these maps, would you still go fishing as intended? Explain your answer (that is, what is your weather prediction?).

Q 109 Clouds form when:-
(a) There is an increase in the temperature of the air.
(b) Moist air rises to higher altitudes.
(c) The air has absorbed a certain amount of heat from the sun.
(d) The centre of an air mass arrives at a given area.

Q 110 With rising temperature, the ability of the air to contain water vapour will:-
(a) Increase.
(b) Decrease.
(c) Remain constant.
(d) Fluctuate.

Q 111 To say that the relative humidity on a given day is 70% means:-
(a) The water vapour in the air constitutes 70% of the air.
(b) The air holds 70% of the total amount of water vapour which it is capable of holding at the temperature.
(c) The air holds 70 parts of water to 100 parts of dry air.

Q 112 The pattern of circulation around a low pressure area in the Southern Hemisphere is:-
(a) Clockwise and away from the centre.
(b) Anti-clockwise and away from the centre.
(c) Clockwise and towards the centre.

Q 113 An isobar is:-
(a) A unit of pressure.
(b) A type of barometer.
(c) A unit of wind speed.
(d) A line connecting points having the same pressure.

Q 114 Wind velocities are apt to be high when:-
(a) The sky is overcast.
(b) The region is surrounded by a high pressure system.
(c) The isobars are close together.
(d) Fog is present in the area.

Q 115 A device for measuring humidity is a/an:-
(a) Hygrometer.
(b) Thermostat.
(c) Hydrometer.
(d) Barometer.

Q 116 The amount of gas that will dissolve in water depends on:-
(a) The temperature of the water.
(b) The surface area of the water exposed to the air.
(c) The salinity of the water.
(d) All of the above.

Q117 A warm front is a weather feature where:-
(a) A warm air mass is moving over a cold air mass.
(b) There is a warm air mass with cold air moving over it.
(c) A warm air mass is moving under a cold air mass.
(d) Cold air is moving under warm air, forcing the warm air up.

Q 118 In relation to cyclones, which of the following statements is incorrect?
(a) The wind blows in a clockwise direction.
(b) Move to open ground away from buildings as they may collapse.
(c) You should listen to a transistor radio.
(d) Don't panic.

Q 119 Which of the following cloud types is most likely to produce rain?
(a) Nimbus.
(b) Stratus.
(c) Cirrus.
(d) Cumulus.

Q 120 The dew point is the temperature at which the droplets become:-
(a) Invisible.
(b) Visible.
(c) Erratic in their behaviours.
(d) Very heavy.

Q 121 In a high pressure system in the southern hemisphere the winds blow?
(a) Clockwise.
(b) Anti-clockwise.
(c) Up and down.

Q122 Which of the following is not a cloud?
(a) Stratus.
(b) Cirrostratus.
(c) Cirrus.
(d) Nimbo columbus.

Q123 Which of the following signs is not associated with cyclone?
(a) Barometer rising fast, to an exceptionally high reading.
(b) A marked heavy ground swell.
(c) As the storm approaches, a marked shift in the direction of the winds as winds as well as increasing wind force.
(d) A distinctly howling wind.

Q124 The two-tone alarm signal broadcast over the radio indicates:-
(a) A cyclone is approaching.
(b) Someone is lost at sea.
(c) There is an emergency in town e.g. a fire.
(d) Transmission has ceased.

Q125 An anemometer is used to measure:-
(a) Wind direction.
(b) Wind speed.
(c) Air pressure.
(d) Humidity.

Q126 Lines which join areas of equal barometric presure are:-
(a) Hectopascals.
(b) Isobars.
(c) Isohyets.
(d) Pressure lines.

Q127 In Australia, weather systems generally move:-
(a) From west to east.
(b) Towards the Equator.
(c) Up and down with the seasons.
(d) From east to west.

Q128 Clouds form when:-
(a) Water vapour in the air condenses into small droplets.
(b) A low pressure system is present.
(c) Water vapour forms into atmospheric intermolecular spaces.
(d) The cloud temperature is reached.

Q129 The dew point is the temperature at which water droplets become:-
(a) Saturated.
(b) Erratic in their behaviour.
(c) Visible.
(d) Invisible.

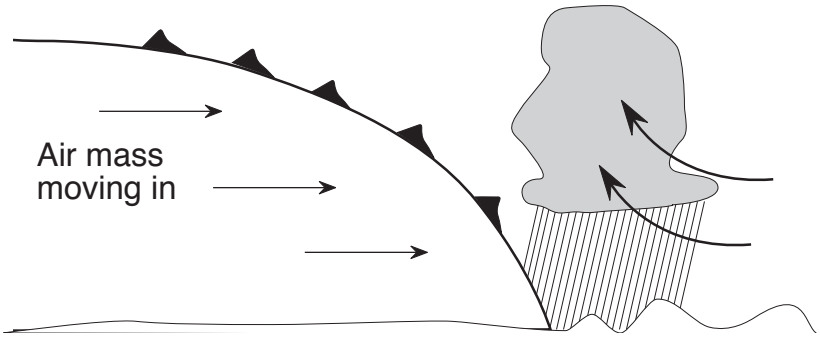
Q130 The gases which form the atmosphere are:-
(a) Nitrogen 78%, oxygen 18%, carbon-dioxide 1%, ozone 3%.
(b) Nitrogen 21%, oxygen 78%, carbon-dioxide 0.03%, ozone 0.9%.
(c) Nitrogen 78%, oxygen 21%, carbon-dioxide 0.03%, argon 0.9%.
(d) Nitrogen 76%, oxygen 21%, carbon-dioxide 2%, water vapour 1%.

Q131 Which of the following sentences are correct:-
1. Sea breezes are usually stronger than land breezes.
2. Land breezes usually disappear by about 8.00am.
3. Sea breezes in Hervey Bay are usually southerlies.
4. Warm fronts usually move through with a change of tide.

(a) All of them.
(b) 3 and 4 only.
(c) 1 and 2 only.
(d) 1 , 2 and 4.

Q132 The diagram represents a:-

(a) Warm front.
(b) Cold front.
(c) Weather map.
(d) Cyclone.



Q133 A front is:-

(a) The boundary between a cold air mass and a hot air mass.
(b) Usually associated with rain and gusty wind.
(c) A weather system which may later develop into a cyclone.
(d) Both A and B are correct.

Q134 An anemometer is used to mesaure:-

(a) Air pressure .
(b) Humidity.
(c) Wind direction.
(d) Wind speed.

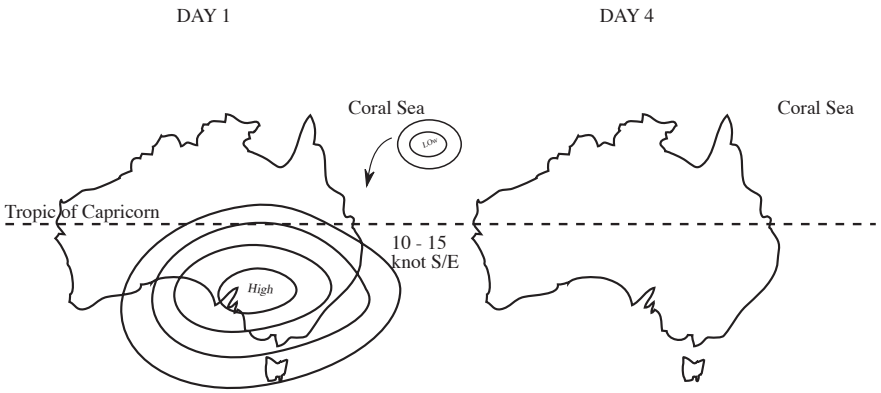
Q135 The general westward then southerly movement of cyclones in the region of Australia is caused by the:-

(a) Intensity of the cyclone.
(c) Coriolis effect.
(c) Solar orbit.
(d) Wind speed.

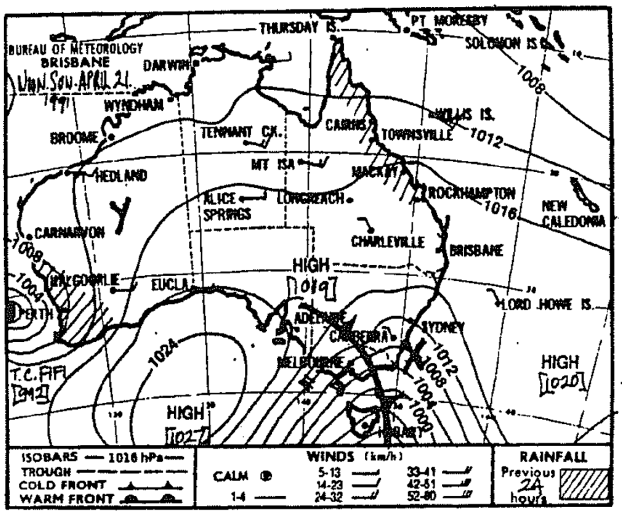
Q136 In what direction would an easterly wind blow a drifting boat?

Q137 Draw a symbol used for a cold front used on weather maps.

Q138 In the diagram below, predict the weather map for day 4 assuming the low pressure continues to move south from the Coral Sea.



The next two questions refer to the weather map below



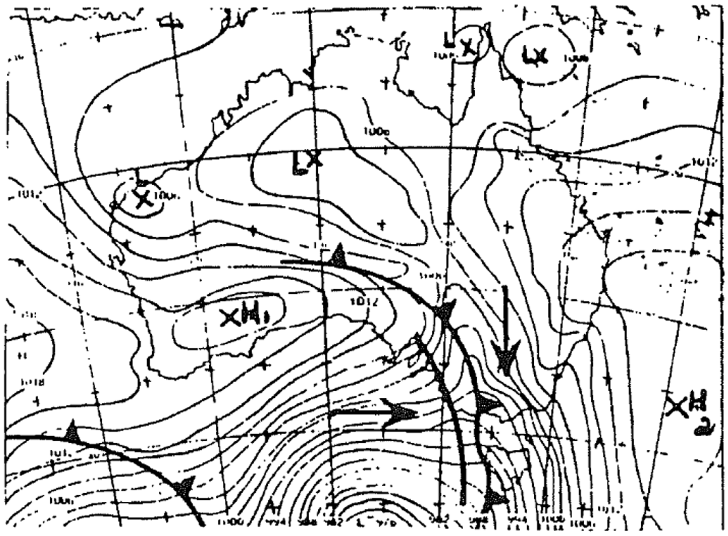
Q 139 Predict the weather conditions for the next day at:-

(i) Brisbane.
(ii) Perth.

Your answer should include relative temperature (higher/lower), wind direction and relative wind speed (stronger/lighter).

Q 140 At which point X or Y, would wind be the strongest? Explain your answer.

The next question refers to the weather map below.

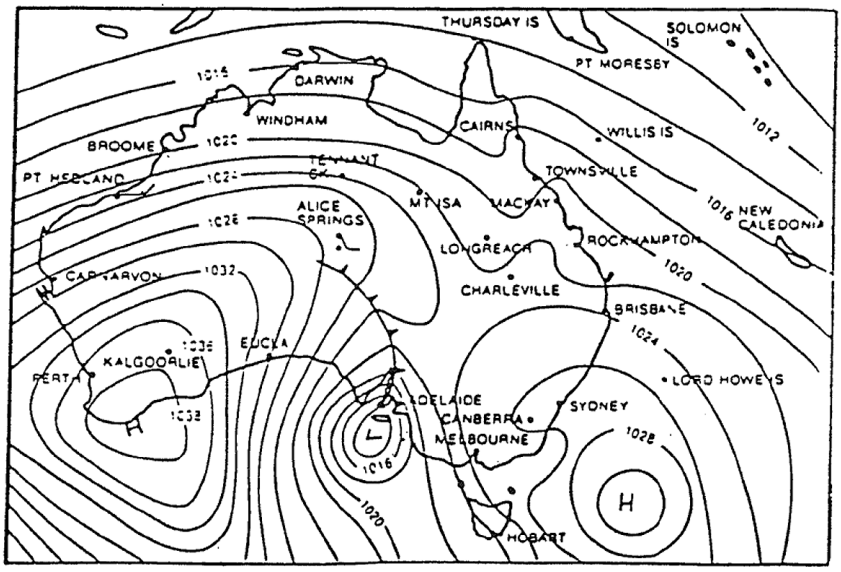


Q 141 (a) Explain what letters L and H mean.
(b) In which direction is the wind moving around H. Show by arrows on the map.
(c) What term is given to the lines drawn around H and L?
(d) In which direction will H_2 be moving?
(e) Briefly describe what the future developments over the next couple of days are likely to be.
(f) You have a reef trip planned for the next day. Briefly give your own small ships forecast for the local area around Innisfail, including:-
(i) wind strength.
(ii) expected sea conditions.
(iii) weather.
(g) Draw a diagram showing how the weather of Innisfail could be affected by the incursion of a cold front into the warm atmosphere of Innisfail.

Q 142 Explain how and why a sea breeze occurs.

Q 143 Draw a diagram showing the structure and wind direction of a cyclone.

The next four questions refer to the weather map below



Q 144 Would you say this is most probably a summer or a winter pattern? Why?

Q 145 What is the wind direction at Rockhampton?

Q 146 Make two comments about the difference between the wind at Pt Headland and at Alice Springs.

Q 147 If this is a synoptic chart for a Saturday, make a prediction for Tuesday's weather in Brisbane.

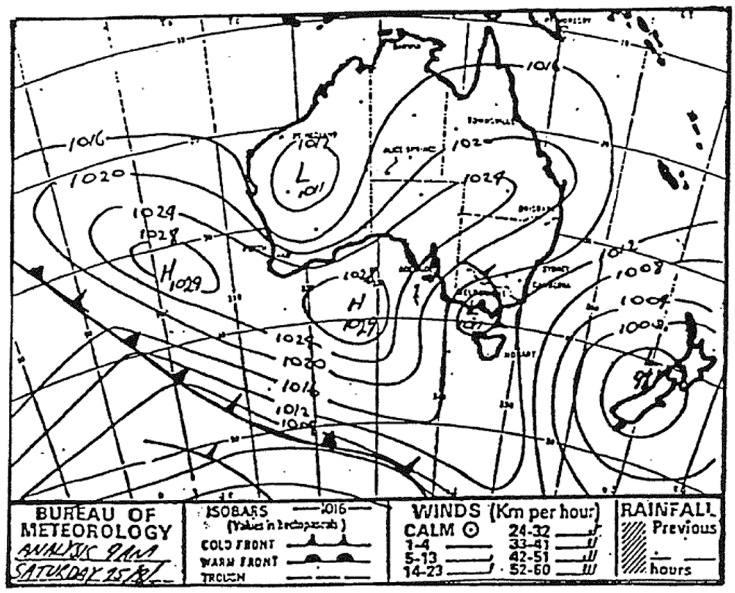
Q 148 Explain carefully the relationship between wind speed and isobars drawn on a synoptic chart.

Q 149 Explain how and why a seabreeze occurs.

Q 150 Using diagrams to aid your explanation, describe the formation structure and wind direction of a cyclone in the southern hemisphere.

Q 151 If a weather forecast indicated ' slight seas and a moderate afternoon seabreeze' and gave high tide at 12.30 pm, how would you describe expected sea conditions by mid afternoon on your local waterway?

The next four questions refer to the weather map below



Q 152 What is the wind direction at Townsville:-

(a) North westerly.
(b) Easterly.
(c) Westerly.
(d) Southerly.

Q 153 You would expect the low over New Zealand to move:-

(a) South west.
(b) West.
(c) North west.
(d) South east.

Q 154 Comment on how the wind at Alice Springs would be different from that at Port Headland.

Q 155 On the basis of the chart, what would you expect Brisbane's weather to be on Monday 27th? Your answer should indicate the likelihood or otherwise of rain, and some idea of wind.

Q 156 On a marine radio, the function of the squelch control is to:-

(a) Increase the volume of messages received.
(b) Increase the clarity of weak signals.
(c) Eliminate much of the background interference.
(d) Stop other stations cutting into a conversation.

Q 157 The limits of the H.F. frequency band are:-

(a) 300 KHz to 3 mHz. (b) 3 mHz to 30 mHz.
(c) 2 mHz to 6 mHz. (d) 30 mHz to 300 mHz.

Q 158 An **EPIRB** is which of the following?

(a) An emergency voice transmitter and receiver.
(b) An emergency voice and direction finding transmitter.
(c) A direction finding transmitter and receiver.
(d) A beacon transmitter.

Q 159 A frequency of 1 Hertz (Hz) means that the cycle is repeated:-

(a) Once per second.
(b) One thousand times per second.
(c) One million times per second.
(d) Once per hundred seconds.

Q 160 Background noise and interference can be eliminated by an increase in the level of which control?

(a) Channel selector. (b) Squelch control.
(c) Volume control. (d) Clarifier.

Q 161 What is switched on to minimise the effect of loud static?

(a) Clarifier. (b) Noise limiter.
(c) Channel selector.

Q 162 Propagation at MF/HF reliable use can be made of:-

(a) Both the ground and skywave. (b) The skywave only.
(c) The ground wave only. (d) None of the above.

Q 163 There are three recognised categories of marine radio. What are they?

(a) AM/FM radio cassette, waterproof radio/cassette, VHF International Maritime Mobile Service.
(b) 27MHz Marine, VHF International Maritime Mobile Service, MF/HF Maritime Mobile Service.
(c) MF/HF Maritime Mobile Service, 27 MHz Marine, EPERB's.

Q 164 One way of describing different waves is to measure their frequency. That is:-

(a) The number of waves passing by in a second.
(b) The number of waves passing by in a minute.
(c) The number of cycles around a clock, that measures the amount of waves in an hour.

Q 165 Write the phonetic word for each of the following letters:-

G, O, Q, U, X, Z, S, J, G.

Q 166 The radio power supply is:-

(a) Pure alcohol.
(b) Sulphuric acid / lead battery.
(c) Hydrochloric acid lead battery.
(d) Motor of boat.

Q 167 The word SECURITE repeated 3 times indicates:-

(a) Your boat has been holed and you are taking water fast.
(b) The station about to transmit the message has information concerning the safety of navigation or is giving an important meteorological warning.
(c) The station transmitting is going to be passing a message on for another boat.
(d) You wish to use the radiotelegram service.

Q 168 When sending a MAYDAY call the information to be sent must contain:-

(a) Name of boat, number of people, amount of luggage.
(b) The words MAYDAY 3 times, position, actual problem.
(c) The words MAYDAY 3 times, name of your boat 3 times, position, actual problem.
(d) The words MAYDAY 3 times, name of your boat and call sign 3 times, position, actual problem, number of people and condition of people, and if possible amount of time left before the boat must be abandoned.

Q 169 What word do you say when you have finished your transmission?

(a) Romeo.
(b) Over.
(c) Out.
(d) Negative.

Q 170 List the four factors which are important in voice procedure when sending a radio message.

Q 171 Seelonce Mayday means:-

(a) Distress message follows
(b) Be quiet distress working in progress
(c) Distressed station to be quiet
(d) Distress is finished.

Q 172 A radio transmission relating to the safety of vessels operating in an area is most likely to fall into the category of:-

(a) Mayday.
(b) Securite.
(c) Pan Pan.
(d) Urgency.

Q 173 Write a description of the following words or terms to show you understand their meaning.

(a) Fuse.
(b) Limited Coast Station.
(c) Affirmative.
(d) EPIRB.
(e) Skip.

Q 174 Which of the following is correct?

(a) A distress message may be sent only 2182KHz during a silence period.
(b) A distress message may be sent on any frequency at any time.
(c) A distress message may only be sent on 2182, 27.88 and channel 16.
(d) A distress message may only be sent during a silence period on any frequency.

The next question refers to the information below

Mayday Mayday Mayday. This is VL6175 TICTAC VL6175 TICTAC VL6175 TICTAC. On behalf of VL4510 BOUNTY out of fuel 10 miles southeast of Brampton Island and with four people aboard.

Q 175 The message written above is:-

(a) A distress message.
(b) A safety message.
(c) An urgency message.
(d) None of these.

Q 176 What is the urgency signal repeated three times when a distress call is not fully justified, that is , when a vessel has an urgent message to transmit concerning the safety of the vessel?

(a) Pan Pan.
(b) Securite.
(c) Mayday.
(d) Help, Help.
(e) Save me.

Q 177 What is the word for the letter 'P' in the phonetic alphabet?

(a) Peter.
(b) Paul.
(c) Pluto.
(d) Papa.
(e) Penguin.

Q 178 Outline the role of the ionosphere in marine radio communications.

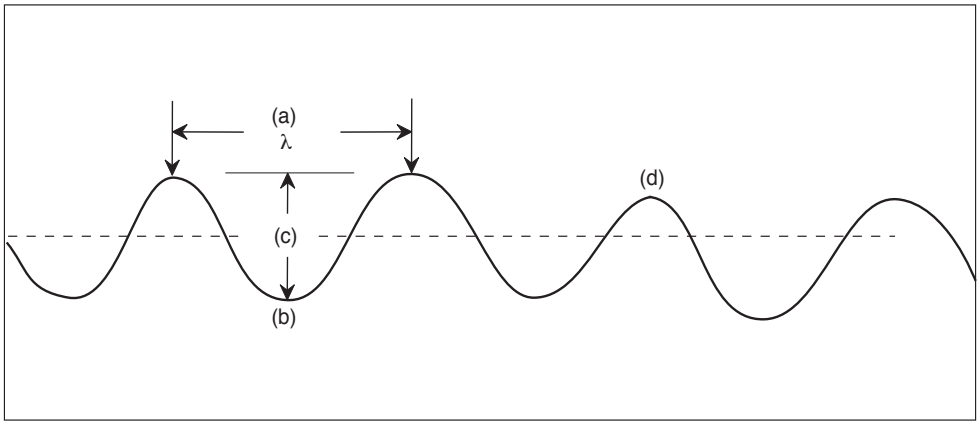
Q 179 Pan Pan is a call to announce:-

(a) Distress traffic after the initial Mayday call.
(b) Urgent message to follow.
(c) Navigational warning to follow.
(d) A french conversation will follow.

Q 180 When there is no immediate danger to life or property but a vessel wishes to alert others of a potential danger the message starts with which of the following:-

(a) Mayday.
(b) Pan Pan.
(c) Securite.
(d) Seelonce Feenee.

Q 181 Label the parts of the diagram labelled (a), (b), (c) and (d) below.



Q 182 If you were sending a RADIO MEDICAL message, what information would you include for the doctor's guidance?

Q 183 What is the meaning of the following radio terminology?

(a) OVER. (b) ROMEO.
(c) AFFIRMATIVE. (d) OUT.

Q 184 Give two (2) circumstances when you would use a **Mayday Relay** message.

Q 185 List four documents which must be carried aboard all vessels with regard to radio operation.

Q 186 Make up suitable headings for a Radio Logbook to meet the Department of Communications requirements.

Q 187 **True or false**?

(a) The transmission of remarks not essential to the service and all superfluous conversation is strictly prohibited.
(b) Profane or obscene language should not be transmitted under any circumstances.

Q 188 List three (3) frequencies which Australian Government Coast Stations maintain a continuous watch during hours of service.

Q 189 Which of the following radios has the greatest operating range?

(a) Marine M.F. AND H.F. (b) Marine V.H.F.
(c) Low frequency - 27 Mhz. (d) U.H.F.

Q 190 Which of the following radio, types would commonly be used by trawlers, commercial charter boats, passenger ferries and private cruises?

(a) Marine M.F. and H.F. (b) Low frequency - 27 Mhz.
(c) Marine V.H.F. (d) UHF.

Q 191 Which of the following radio types would be most commonly used by small, private boats and amateur fishermen?

(a) Marine M.F/H.F. (b) Marine VHF.
(c) 27MHz. (d) U.H.F.

Q 192 Your receiver is working normally, but when you press the transmit button everything "dies" including dial lights etc. Which of the following is the most likely cause?

(a) Blown fuse. (b) Faulty aerial (antenna).
(c) Battery almost discharges. (d) Faulty press to talk switch.

Q 193 When you switch on, both transmitter and receiver sections of your set are "dead". Which of the following is the most likely cause?

(a) Faulty aerial (antenna). (b) Faulty transmitter.
(c) Faulty receiver. (d) Blown fuse.

Q 194 If there are in lights, no receiver noise and no transmitter output, the problems would be.

(a) Battery almost flat. (b) Fuse blown.
(c) Faulty microphone. (d) Faulty earth.

Q 195 Which channel (27MHz radios) should be used for distress and initial calling:-
(a) 86. (b) 88.
(c) 91. (d) 96.

Q 196 Which of the following is an international supplementary distress and calling frequency?
(a) 2201 KHz. (b) 2638 KHz.
(c) 4125 KHz. (d) 4428 KHz.

Q 197 Which of the following is an international distress/calling channel?
(a) 2525KHZ. (b) 4629 KHz.
(c) 27.88MHz (Ch88). (d) Channel 16 (VHF).

Q 198 When ship and coast stations are communicating, which station has the right to choose frequencies, transmission time etc.
(a) Coast station. (b) Ship station.
(c) Arranged by mutual agreement.

Q 199 A limited Coast Station (AVCG, Air Sea Rescue, Fish Board etc) is:-
(a) Permitted to charge by the minute for messages received for phoning through.
(b) Not permitted to charge for such messages.
(c) Permitted to charge by the word for such messages.
(d) Not permitted to accept such messages.

Q 200 Using a VHF set, the range from small boat to small boat would be:-
(a) 120 nautical miles. (b) 1 nautical mile.
(c) 10 nautical miles. (d) 35 nautical miles.

Q 201 List the distress and calling frequencies for the 2, 4, 6, and 27 MHz bands.

Q 202 When relaying distress signals which would be the correct way to identify the distressed ship?
(a) "Distress for " (boat name).
(b) "On behalf of (boat name).
(c) (boat name) is in distress".
(d) "Relay distress message on behalf of " (boat name).

Q 203 Write the words from the phonetic which relate to the following letters:-
(a) F. (b) T.
(c) N. (d) V.

Q 204 If the receiver is O.K but there is not transmitter output and the dial lights go out when the microphone is pressed the problem would be:-
(a) Almost flat battery. (b) Transmitter has been turned off.
(c) Antenna broken. (d) Antenna intermittent .

Q 205 The international signal to say 'Distress working has ended' is:-
(a) Seelonce Mayday. (b) Mayday ended.
(c) Seelonce feenee. (d) Mayday feenee.

.

Q 206 The frequency designated to send a distress message is:-

(a) 27.88.
(b) 27.94.
(c) 27.68.
(d) 27.91.
(e) 27.000.

Q 207 Which of the following frequencies will travel the furthest?

(a) 27MHz.
(b) MF/HF.
(c) VHF.
(d) 26 MHz.

Q 208 The letters ETA stand for:-

(a) Estimated Trolling Angle.
(b) Elevated Transom Arm.
(c) Everybody has been taken Away.
(d) Eastern Trade Association.
(e) Estimated Time of Arrival.

Q 209 Match the following frequencies with their designated usage.

1. 27.82MHz.	(a) ship - ship.
2. 27.88MHz.	(b) distress/calling.
3. 27.96MHz.	(c) international distress/calling.
4. VHF ch 73.	(d) ship - shore calling/working.
5. VHF ch 16.	(e) calling/working.
6. 27.91 MHz.	(f) professional fishing industry.

Q 210 Can a Mayday call be made on more than one frequency? If so, what frequency ? If not which single frequency?

Q 211 Describe how you would book a "Radphone" call through a coast radio station.

Q 212 Write down the times of the silence periods for radio telephone operation.

Q 213 Write the phonetic alphabet form of the vessel name " MARYBOROUGH CHIEFTAIN".

Q 214 You vessel's name is Alpha and you are seven miles North West of Cape Moreton . You notice one of the north west spit buoys is out of place. Write down an appropriate radio message.

Q 215 MAYDAY MAYDAY MAYDAY
THIS IS
VL2865 SEABIRD VL2865 SEABIRD VL2865 SEABIRD
MAYDAY THIS IS VL2865 SEABIRD
POSITION 25 MILES SOUTHEAST OF BRAMPTON ISLAND- ON FIRE - REQUIRE IMMEDIATE ASSISTANCE - FOUR PERSONS ABOARD - HAVE A LIFE RAFT.

The message written above is:

(a) A safety message.
(b) An urgency message.
(c) A distress message.
(d) A distress call and message.

Q 216 If you receive a shock from your radio when transmitting on your MF/HF set, the problem would be:-
(a) Faulty microphone.
(b) Intermittent power supply connections.
(c) Faulty earth.
(d) Someone's practical joke.

Q 217 Your radio fuse has blown. One of the following should prevent any damage occurring when the fuse is replaced.
(a) Wrap the fuse in aluminium foil and replace it.
(b) Put a piece of fine wire across the fuse terminals.
(c) Replace with a slightly larger fuse.
(d) Replace with a slightly smaller fuse.

Q 218 How will you know if you transceiver is "live".
(a) It will say so.
(b) It affects the transmission.
(c) You receive a shock.
(d) None of the above.

Q 219 If battery plates are not covered with electrolyte (liquid), which of the following should you add?
(a) Salt water.
(b) Sulphuric acid.
(c) Distilled water.
(d) Acid and water mixed.

Q 220 Which of the following would be the most likely cause of one cell of a battery needing to be topped up more often than the others?
(a) Crack in the battery case. (b) Getting too much charge.
(c) Cell stronger than the others. (d) Cell breaking down.

Q 221 A radio transmitter produces a signal with a wave length of 12.5m. Calculate the operating frequency of the transmitter in MHz?

Q 222 Explain the meaning of the term "skip".

Q 223 When and why would you pass ship position reports to a coast radio station?

Q 224 State what action you would take if you received a radio call from an unidentified station.

Q 225 You have missed a scheduled weather broadcast. Are you allowed to call a coast station requesting weather information?

Q 226 All radio systems are composed of three distinct parts. Write a paragraph outlining the function of each.

Q 227 Write a short account of the O.T.C. Network and the services they provide.

Q 228 Discuss the timing and importance of radio silence periods.

Q 229 Explain the difference between a carrier wave and an audio wave, and explain and illustrate the methods by which the carrier wave is 'modulated' in an AM transmitter.

Q 230 What is meant by AM in relation to radios? How does it differ from FM?

Q 231 What is the relationship between antenna length and wave length of the transmitted frequency?

Q 232 Identify the **errors** and **omissions** in the following radio transmission and write out the corrected message.

. *VN4HV, VN4HV, VN4HV*
. *This is Sea King*
. *We are heading out to the Fairway Beacon for a day's fishing ... over*
. *Roger to that Sea King give us a call when you return, have a pleasant day*
. *VN4HV OVER AND OUT.*

Q 233 Your receiver does not make a noise when you switch off the muting (squelch). No calls are received. Dial/indicator lights are on and the case is hotter than normal to the touch. Which of the following is the most likely cause of this condition?
(a) Faulty speaker.
(b) Faulty microphone.
(c) Battery leads reversed.
(d) Transmitter stuck on.

Q 234 You are travelling from Glady's Inlet on your 8 m cruiser to Feather Reef when you hit a submerged log, and are taking in water fast, You are positioned halfway to the reef, in 40 metres of water. When your vessel struck the log one of your crew fell forward and broke his leg. You have 2 adults and 2 children on board. Write the message you would transmit over your 27MHz radio.

Q 235 You are in a 4.5. runabout named Seahorse, that has hit a submerged object out from Moon Point. The motor leg has broken off. There is a slight crack in the transom below the waterline and a small amount of water is leaking into the boat. At present you are in 1m of water and the tide is dropping. There are 4 people on board. Write out the complete message you would send in this situation.

Q 236 Your 16m yacht has hit a whale, and your pump cannot control the inflow of seawater. You have about half-an-hour left afloat, and are approximately half-way between Lady Elliot Island and Rooney's Point. You have 3 crew. Write the message which you would send.

Q 237 Write a script for a radio message between a vessel named 'CLASS" and the TIN CAN BAY MARINA. The vessel will arrive at 9.00am and requires 300 gallons of water, 100 gallons of fuel and a part for his bilge pump. The marina has all the requirements asked for. Be sure to insert "/" where a pause should be made in the transmission.

Q 238 Write the following message as it would be transmitted:
You are VM3XKY, Weipa Harbour. Warn vessels in the area that a ship carrying explosives has caught fire at the entrance to the Harbour Leeds. The situation is potentially dangerous and all non-emergency traffic should avoid the area.

Q 239 You are Sabre, VKQ1359; your vessel has hit the southern end of Chinaman Reef, 38 Nm east of Port Douglas, and is sinking rapidly. You and 2 other adults are about to activate E.P.I.R.B. and abandon ship in one R.F.D.

Q 240 Write cut a paid telegram to suit Department of Communications requirements as laid out in the handbook to meet the following circumstances.

Message reads - MRS SMITH 25 THE STRAND REDCLIFFE WILL BE HOME WEDNESDAY AFTER NOON . BILL.

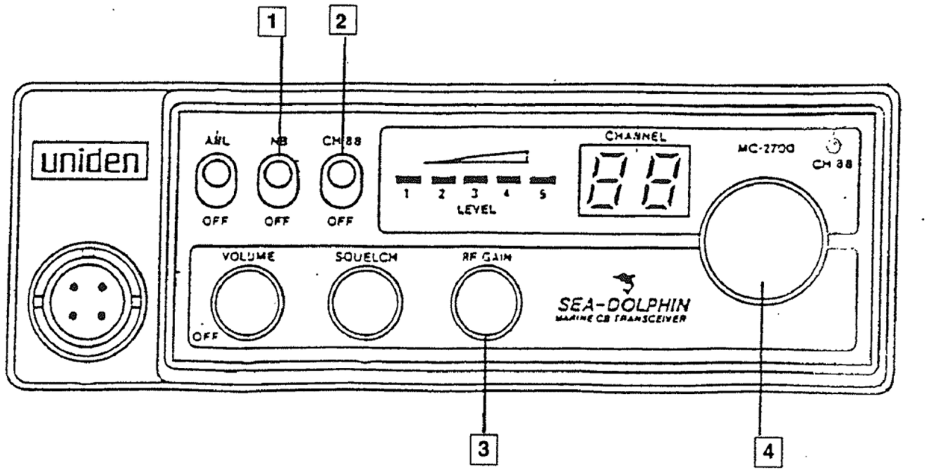
This message was handed in on the vessel SILVER STREAM , call sign VL1326 at 9.45 am on the fifteenth day of the month.

Q 241 You have received a distress message and consider you are the nearest vessel to offer help. Write how you would acknowledge the distress message.

Q 242 Your vessels name is Peter. It has struck a reef and is sinking rapidly. You estimate your position to be latitude 23^0 50's longitude 153^0 15'E. There are 16 people on board and you carry two 10 men lifeboats. Write down an appropriate priority radio message.

Q 243 A frequency of 2,340,000Hz in KHz is:-
(a) 0.234 KHz.
(b) 23.40 KHz.
(c) 2.340 KHz.
(d) 2.340 KHz.

Q 244 Explain the function of the four controls indicated in the diagram below:-



Q 245 Your vessel's name is Boundary Rider. A crew member has fallen overboard 5 miles due east of Newcastle. When last seen at 12.00 midnight the victim was alive and wearing a lifejacket, You have lost sight of her due to the sea conditions and require help urgently. Write down an appropriate priority radio message.

Q 246 Which of the following is **not** a correct radio procedure?

(a) Hold the microphone in the palm of the hand, finger and thumb press the button.
(b) Keep microphone to the side of the mouth.
(c) Talk slightly louder than normal, directly into the microphone.
(d) Talk slowly and clearly, maintaining pitch.

Q 247 Which radio control would be used to stop constant and annoying background hiss?

Q 248 V.H.F. ship to ship communication is regularly possible up to what distance?

Q 249 Construct an appropriate radio message for each of the following situations.

Situation A

Your vessel is "MORNING STAR". Your location is latitude 26^0 30' south, longitude 157^0 20' east. On board is your family (wife and 3 children) and pet dog. Your radio call sign is VM 340 and "MORNING STAR" is a 52ft Ketch. "MORNING STAR" is taking water and you estimate that she will sink in less than 20 minutes. "MORNING STAR" is equipped with a life raft.

Situation B

You receive a weak but clear Mayday message from a vessel called "TRIDENT". "TIDENT" NA 202, a 30ft. motor sailer is 150 Nm. east of Mooloolaba, is sinking rapidly and has 3 people on board. The message is unanswered by any other vessel and you are too far away to assist quickly in your vessel "WANDERER" VC 154.

Situation C

You and your mates are fishing 6 Nm. south of the Gneerings. Your white 23ft. Shark Cat "WANDERER" has motor failure. You are able to anchor, however the weather is rapidly becoming dangerous.

Situation D

You are heading home from a successful fishing trip when you sight a shipping container floating in the main shipping channel 2 nm. north east of Bribie Island. Your vessel is "DRAGON" VC 101.

Situation E

In your vessel "RABBIT" VG 351, you are enjoying a spot of fishing on the Swains when you hear a Mayday from a small vessel about 15 minutes away from your position. The vessel's name is "JACK" PT 250.

Q 250 What regulations govern the use of:-

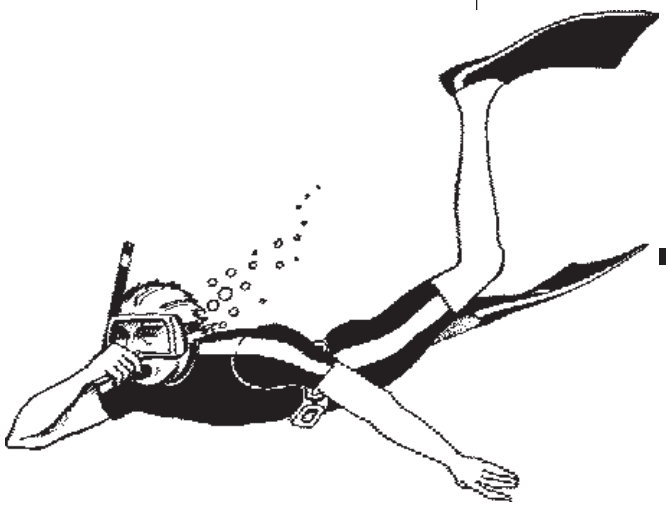
(a) 27 mhz radios?
(b) UHF/VHF radios?

Topic 3

Exam questions

SNORKELLING

and swimming in the sea



Q1 The rate pressure increases as you descend below the surface of the sea is:-
(a) 100 Kpa per 1m.
(b) 100 Kpa per 20m.
(c) 100 Kpa per 10m.
(d) 100 Kpa per 0.1m.

Q2 The part of the lung where gas exchange takes place with the blood is the:-
(a) Trachea.
(b) Bronchi.
(c) Alveoli.
(d) Bronchiole.

Q3 The composition of the atmosphere is:-
(a) 70% nitrogen, 28% oxygen and 2% other gases.
(b) 70% nitrogen, 21% oxygen and 9% other gases.
(c) 70% nitrogen, 22% oxygen and 8% other gases.
(d) 70% nitrogen, 25% oxygen and 5% other gases.

Q24 The build up of which gas in the blood tells the brain that we need to inhale?
(a) Nitrogen.
(b) Oxygen.
(c) Carbon dioxide.
(d) Carbon monoxide.

Q5 Essential items for snorkelling are:-
(a) Fins, snorkel and mask.
(b) Mask, wet suit and fins.
(c) Weight belt, snorkel and fins.
(d) Wet suit, snorkel and mask.

Q6 Which of the following is **not** a requirement of a good mask?
(a) Back strap should be flexible, split and heavy.
(b) Face mask should be made of safety glass.
(c) Mask should have a high air volume.
(d) Mask should have a soft double seal.

Q7 After snorkelling, equipment should be washed in:-
(a) Freshwater, dried and left in the sun.
(b) Freshwater, dried and stored away from sunlight.
(c) Saltwater, dried and left in the sun.
(d) Methylated spirits to cure all germs and then washed in salt water.

Q8 Hyperventilation is:-
(a) Necessary before descending as it allows more oxygen to enter the blood making diving easier.
(b) Having an excess of holes in the wet suit causing it to perish with time.
(c) Taking too many breaths before diving.
(d) Dangerous as the carbon dioxide is removed from the body creating no trigger to begin breathing.

Q 9 When equalising, you pinch your nose and close your mouth, force air out through the eustachean tube to what part of the ear?
(a) Cochlea.
(b) Inner ear.
(c) Middle ear.
(d) Outer ear.

Q10 Having a cold or bad sinus:-
(a) Makes no difference to a snorkeller, only to a SCUBA diver.
(b) Causes some discomfort but it is possible to dive.
(c) Makes equalising almost impossible.
(d) Can cause secondary infections of the lung after diving.

Q11 During World War II, the Scientist who invented the regulator which allowed the divers to breathe compressed air was:-
(a) Jacques Cousteau.
(b) Robert Boyle.
(c) Greg Scuba.
(d) August Siebe.

Q12 Which of the following statements is **correct?**
(a) Clearing a mask must be done underwater.
(b) It is all right to snorkel alone if you are in shallow water and the sea is calm.
(c) When finning, legs should not bend at the knees.
(d) You should breathe deeply and rapidly immediately before diving to increase the amount of oxygen in the lungs.

Q13 The term, "equalising", best describes:-
(a) Using a weight belt to maintain neutral buoyancy.
(b) Compensating for changes in pressure between the mouth and the ear when diving.
(c) Compensating for the increased density of water when diving.
(d) Expelling air from the lungs when you swim to the surface.

Q14 Which of the following features would you look for in a mask you were purchasing?
(a) Nose pocket.
(b) Tempered glass.
(c) Silicon.
(d) All of the above.

Q 15 If you want your mask to wear out quickly, your would:-
(a) Wash it in fresh water.
(b) Dry it in the sun.
(c) Dry it in the shade.
(d) Rub silicon grease over the rubber.

Q 16 Which of the following factors affect buoyancy in the water?
(a) Body type.
(b) Water type.
(c) Lung volume.
(d) All of the above.
(e) None of the above.

Q 17 Buoyancy is said to have 3 states. Which one of the following is **not a state?**
(a) Positive.
(b) Negative.
(c) Static.
(d) Neutral.

Q 18 Aural barotrauma causes which of the following systems?
(a) Bleeding from the nose.
(b) Pain in the forehead.
(c) Pain in the ears.
(d) All of the above.
(e) (a) and (c) only.

Q 19 Boyles law states:-

(a) $P_1V_1 = P_2V_2$

(b) $P = V/P_2$

(c) $P_1V_1T_1 = P_2V_2T_2$

(d) none of the above.

Q 20 Which of the following areas would be affected by Boyles Law?
(a) Lungs.
(b) Ears.
(c) Sinus.
(d) Mask.
(e) All of the above.

Q 21 Which of the following is the best treatment for a wound from a Stingray?
(a) Vinegar.
(b) Hot water.
(c) Pressure bandage.
(d) Cut wound to encourage bleeding.
(e) None of the above.

Q 22 The pressure acting upon a diver's body at 30m is:-
(a) 2 ATA.
(b) 3 ATA.
(c) 4 ATA.
(d) 5 ATA.
(e) None of the above.

Q 23 A 16 l baloon is filled at the surface and then taken to 30m, the volume of air it contains will be:-
(a) 5 l.
(b) 4 l.
(c) 3 l.
(d) 2 l.
(e) none of the above.

Q 24 Why do objects at 30m below the surface appear bluey-green in colour:-
(a) Objects at 30 m are coloured blue green.
(b) Red light has the longest λ and is therefore absorbed first.
(c) Blue light has the longest wavelength and is therefore absorbed first.
(d) The colour red fades under water due to the increase in water pressure.

Q 25 It is difficult to determine the direction of sound underwater because:-
(a) Sound travels slower under water.
(b) Sound travels faster under water.
(c) The marine life make so much noise it interferes with other sound.
(d) The sound waves move further apart.

Q 26 The bore on a snorkel should not be too long and thin because:-
(a) It will get caught on overhead objects.
(b) It causes a CO_2 problem as a diver rebreathes his own air.
(c) It is too difficult to clear the water from.
(d) You need a large lung volume to clear the snorkel.
(e) All of the above.

Q 27 Which of the following indicates the best management plan following a shark attack on a victim?
(a) Call for help, transport victim immediately to hospital , treat for shock , apply pressure and elevation.
(b) Call for help, apply pressure and elevation, stabilize patient before transport, treat for shock.
(c) Call for help, treat for shock, apply pressure and elevate, transport victim immediately to hospital.
(d) Call for help, apply pressure and elevation, treat for shock, transport victim immediately to hospital.

Q 28 The bending of light rays when they enter water is called:-
(a) Reflection.
(b) Refraction.
(c) Diffraction.
(e) Absorption.

Q 29 The part of the respiratory system which is **not** part of the lung is the:-
(a) Trachea.
(b) Bronchi.
(c) Bronchiole.
(d) Alveolus.

Q 30 Equalisation during descent is necessary because:-
(a) The pressure inward on the ear drum is greater than outwards.
(b) The pressure outwards on the ear drum is greater than inward.
(c) The pressure of air in the lung increases.
(d) The ear becomes filled with water.

Q 31 The strong elastic tube-like vessels which carry bright scarlet blood away from the heart are called:-
(a) Capillaries.
(d) Veins.
(c) Arteries.
(d) The lungs.

Q 32 Putting the head in backward tilt and lifting the lower jaw forward will:-
(a) Help clear the airway because it pulls the tongue away from the back of the throat.
(b) Improve the blood circulation.
(c) Depress the diaphragm.
(d) None of the above.

Q 33 Pressure on the xiphoid process could:-
(a) Assist the patient to breathe.
(b) Result in damage to organs inside the abdomen.
(c) Clear the airway.
(d) Block the airway.

Q 34 The two chambers on the left side of the heart:-
(a) Collect the blood from the body and pump it to the lungs.
(b) Control the rate of breathing.
(c) Receive the oxygen-enriched blood from the lungs and pump it around the body.
(d) None of the above.

Q 35 Oxygen from the air we breathe in, is supplied to the blood in the:-
(a) Heart.
(b) Diaphragm.
(c) Abdomen.
(d) Lungs.

Q 36 What is the name of the vessel which carries deoxygenated blood from the heart?
(a) Aorta.
(b) Pulmonary Artery.
(c) Pulmonary Vein.
(d) Vena Cava.

Q 37 The air we breathe out contains approximately:-
(a) 16% oxygen.
(b) 25% oxygen.
(c) 21% oxygen.
(d) No oxygen at all.

Q 38 An unconsious patient who is not breathing and has no pulse requires:-
(a) C. P. R.
(b) E. A. R. only.
(c) E. C. C. only.
(d) To be placed in the lateral position.

Q 39 External bleeding from a wound should be treated by:-
(a) Direct pressure on the bleeding part with fingers or a pad and bandage.
(b) Elevate the wounded limb if there is no fracture.
(c) Seek medical help.
(d) All the above.

Q 40 Any person who has suffered a head injury should:-
(a) Be allowed to return to normal activities as soon as possible.
(b) Obtain a medical clearance before returning to sporting activites.
(c) Be given sips of alcohol during the recovery period.
(d) Only require attention if unconscious.

Q 41 To treat a patient who has been burnt by flames you should:-
(a) Immediately apply a lotion.
(b) Break all blisters and apply a lotion
(c) Immediately cool the burn area with cold water for about 10 minutes.
(d) Remove all clothing that is sticking and apply ointment.

Q 42 Management of a patient suffering from sunburn is:-
(a) Cold showers and rest in a cool place.
(b) Cold compressions.
(c) Give fluids by mouth.
(d) All of the above.

Q 43 15 Breaths per minute is the correct rate of E.A. R. for:-
(a) A baby.
(b) An infant.
(c) An adult.
(d) None of the above.

Q 44 When performing E. A. R. on a child the breaths should be:-
(a) Faster and shallower than in adults.
(b) Faster and deeper than in adults.
(c) Slower and deeper than in adults.
(d) Slower and shallower than in adults.

Q 45 The cycle for 1 person performing C . P. R. on an adult is :-
(a) 5 breaths followed by 10 compressions.
(b) 2 breaths followed by 15 compressions.
(c) 2 breaths followed by 5 compressions.
(d) 1 breath followed by 5 compressions.

Q 46 The cycle for 2 operators performing C. P. R. on an adult is:-
(a) 15 breaths followed by 2 compressions.
(b) 1 breath followed by 10 compressions.
(c) 2 breaths followed by 15 compressions.
(d) 1 breath followed by 5 compressions.

Q 47 Before commencing any resuscitation you should:-
(a) Make the patient comfortable and cover him/her with a blanket.
(b) Seek medical help and then commence C. P. R. straight away.
(c) Quickly assess the patient to determine the correct treatment.
(d) None of the above.

Q 48 The rate for E . A. R. in children is:-
(a) 15 breaths per minute.
(b) 20 breaths per minute.
(c) 12 breaths per minute.
(d) 10 breaths per minute.

Q 49 To determine whether a patient is conscious or not you should:-
(a) Use the shake and shout method and check their response.
(b) Seek medical help.
(c) Take their temperature.
(d) Give them 5 quick breaths and check the carotid pulse.

Q 50 Mouth to mask expired air resuscitation:-
(a) May be used on any patient where the operator prefers this method.
(b) Should only be used on medical advice.
(c) Is not effective and should never be used.
(d) Should only be used with the air bag oxygen resuscitator.

Q 51 Checking of the carotid pulse should take:-
(a) At least 10 seconds.
(b) Less than 2 seconds.
(c) 5 seconds.
(d) 15 seconds.

Q 52 Trish has a cut on her forehead having fallen over in the boat. What should you do first?
(a) Sit Trish up and hold a pad on it.
(b) Lie Trish down and elevate her feet.
(c) Go for help.
(d) Apply indirect pressure.

Q 53 Jane has a bad cut on her arm. A lot of blood soaks through the pad. What do you do?
(a) Put a new pad on top of the old one.
(b) Take off the old one and put on a new one.
(c) Apply a compressive bandage above the cut.
(d) Use a tourniquet.

Q 54 An accident vicitm is conscious, has a broken leg and blood is gushing from a large cut on the leg. What do you do firstly:-
(a) Splint the leg.
(b) Check for breathing.
(c) Give the person E. A. R.
(d) None of the above.

Q 55 If the pressure bandage on an arm causes the hand to become cold and numb, the bandage is:-
(a) Too loose.
(b) Just right.
(c) Too tight.
(d) Not tight enough.

Q 56 An infection following a wound could cause:-
(a) Fever.
(b) Nausea.
(c) Headache.
(d) All of the above.

Q 57 If there is a sizeable (fairly large) foreign body protruding from a wound, the rescuer should:-
(a) Remove it to prevent infection.
(b) Leave it because removal may cause serious bleeding.
(c) Remove it to make it easier for the doctor.
(d) Remove it so the doctor can better see any underlying damage.

Q 58 Bleeding from the mouth or nose could indicate bleeding from all, **except** which of the following:-
(a) In the lungs.
(b) In the colon (large bowel).
(c) In the oesophagus.
(d) In the stomach.

Q 59 An accident victim has severe face injuries and is on his back, bleeding freely into his mouth. What would you do first?
(a) Try to control the bleeding with pressure bandages.
(b) Turn him so that the blood will run out of his mouth.
(c) Cover him as part of your treatment for circulatory collapse.
(d) Elevate his head and shoulders.

Q 60 Cold clammy skin; a rapid feeble pulse; change in the conscious state, and sighing respiration are all symptoms of:-
(a) Shock.
(b) A heart attact.
(c) Hypothermia.
(d) A nose bleed.

Q 61 To treat a patient who has been burnt by an open flame,the first aider should:-
(a) Apply ointment.
(b) Apply a pressure bandage.
(c) Apply lotions.
(d) Immediately cool the burn area with cold water for about ten mintues.

Q 62 The treatment for a person who has been stung by a Chironex Fleckeri (Box Jellyfish) is to douse the stung area with vinegar. The reason for using vinegar is:-
(a) To relieve pain.
(b) To inactivate nematocysts of any tentacles still remaining on the patient.
(c) To ease swelling.
(d) All of the above.

Q 63 Pressure immobilisation is **NOT** used for which of the following bites or stings:-
(a) Snakes.
(b) Funnel web spider.
(c) Bees.
(d) Red back spider.

Q264 Which of the following takes priority in all emergency situations? The rescuer must:-
(a) Ensure safety for rescuer and patient.
(b) Care for airway, breathing and circulation.
(c) Control bleeding.
(d) Splint or immobilise fractures.

Q 65 When resuscitating an infant patient, the rate of E. A. R. should be:-
(a) 5 breaths per minute.
(b) 10 breaths per minute.
(c) 15 breaths per minute.
(d) 20 breaths per minute.

Q 66 After an accident there is no sign of blood. The victim has a cold moist skin and feels pain in the stomach. The victim probably has:-
(a) Cardiac arrest.
(b) Pulmonary arrest.
(c) An infection.
(d) An internal injury.

Q 67 An abrasion is:-
(a) A wound resulting from a rubbing or scraping.
(b) A sharp cut.
(c) A jagged tear of tissue.
(d) Any of the above.

Q 68 Swimming goggles should not be used for snorkelling because:-
(a) The diver can't equalise his/her ears.
(b) The diver will suffer an eye squeeze.
(c) The diver will suffer an ear squeeze.
(d) The goggles fog up.
(e) None of the above.

Q 269 Which of the following would **not** be a cause of shock?
(a) Severe blood loss.
(b) Fluid lost from the tissue as in severe burns or diarrhoea.
(c) Severe pain causing a drop in blood pressure.
(d) The closing of blood vessels throughout the body causing major organs getting too much blood.

For the next two questions choose the incorrect response

Q 70 An indication of interference with the circulation while bandaging a forearm is:-
(a) Absent radial pulse below the bandage.
(b) Reddish tinge of the fingernails.
(c) Swelling of the fingers.
(d) Numbness in the fingers.

Q 71 The body tries to control a haemorrhage by:-
(a) Lowering the blood pressure.
(b) Dilating blood vessels at the site of the haemorrhage.
(c) Depositing fibrin at the site of the haemorrhage.
(d) Trapping the blood cells at the site of haemorrhage.

Q 72 Write a paragraph on hypothermia. Your paragraph should include the following points:
1. Fall in body temperature.
2. How this fall in temperature is made worse.
3. Signs and symptoms.
4. Treatment.
5. Protection.

Q 73 Explain how oxygen and carbon dioxide are exchanged in the lungs.

Q 74 You are asked to talk to a group about the dangers of hyperventilation. In your talk you must cover what hyperventilation is; the changes that occur, and the dangers of this practice. Briefly outline what you would say.

Q 75 Calculate the pressure exerted on a snorkel diver's body when submerged to a depth of 3.7m.

Q 76 Explain the term **aural baratrauma.**

Q 77 If the intial volume of a snorkel divers' lungs at the surface is 5.3 litres, at what depth will the diver be when the volume has become 4.2 litres?

Q 78 Write a short account on why hyperventilation is a dangerous practice.

Q 79 List the golden rules of snorkelling.

Q 80 What features should you look for when choosing a face mask?

Q 81 Calculate the pressure exerted on a snorkel diver's body when submerged to a depth of 53metres.

Q 82 List the potential dangers in handling a sea urchin or stinging hydroid.

Q 83 List 3 dangerous marine organisms of your local area and outline the first aid for each.

Q 84 What good qualities should be looked for when purchasing a mask and a snorkel?

Q85 What is the function of the trachea, diaphram and heart valves in respiration and circulation?

Q 86 A snorkeller has been collecting shells. He returns to the boat bleeding slightly from a small and painless cut on the palm of his hand. Among the collected shells is what appears to be a cone shell. Outline **fully** the steps to be taken at **each stage** of the treatment.

Q 87 In what way does the composition of expired air and atmospheric air differ?

Q 88 You have gone snorkelling with a friend. Your friend dives into the water and a moment later is floating face down in the water. Outline the steps you would take, indicating all possible outcomes for this accident.

Q 89 What are two (2) methods of equalising under water:

Q 90 With the aid of a diagram show the best way to clear a snorkel, then briefly outline why it is the best method.

Q 91 Name three (3) methods of water entry.

Q 92 What four (4) major points should be kept in mind when finning.

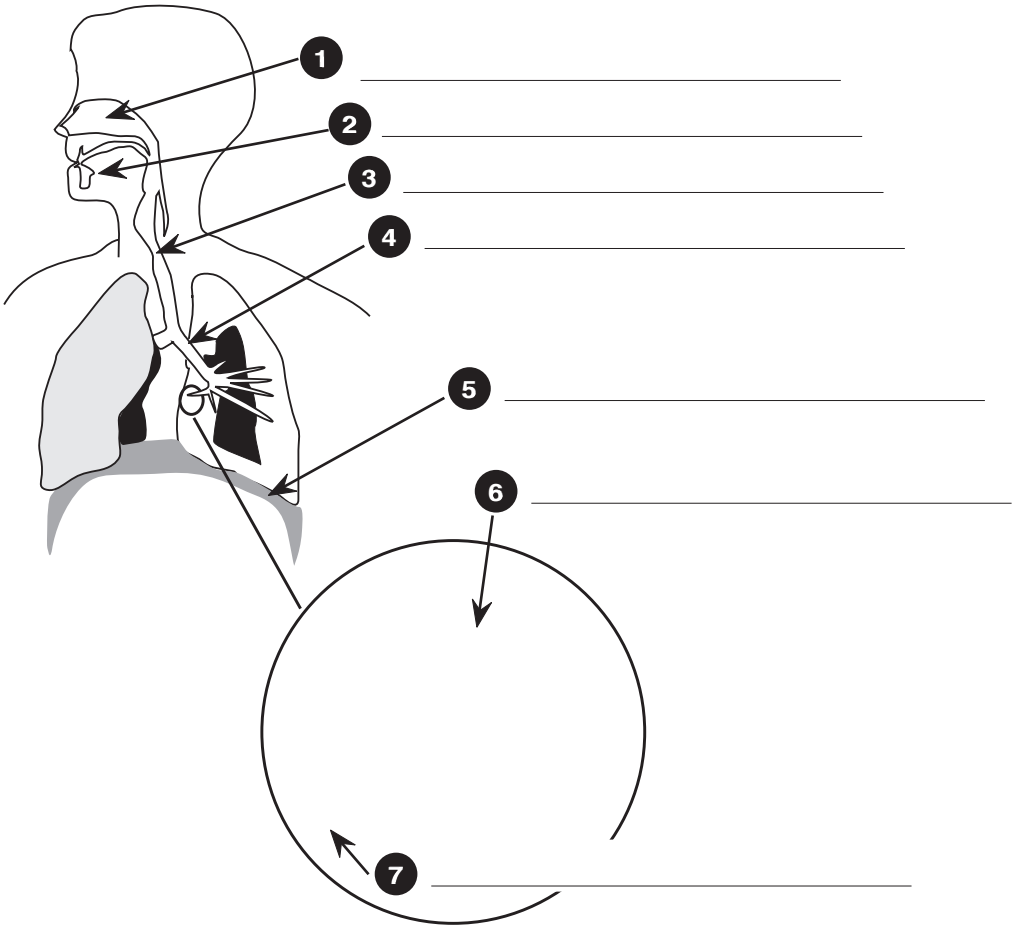
Q 93 (a) Describe in detail what you understand by the term "Hyperventilation"
(b) What happens when a person hyperventilates?
(c) What are the first symtons of excessive hyperventilation?

Q 94 Explain why marine life appears 25% larger underwater when using a mask. Use of diagrams may be useful.

Q 95 When selecting a snorkel, what are 3 **major** points to consider ?

Q 96 Explain the advantages of using a weight belt.

Q 97 Name the following parts of the Respiratory System.



Q 98 Which of the following has a life threatening sting?
(a) Stinging hydroid.
(b) Sea urchin.
(c) Stonefish.
(d) Chironex fleckeri.

Q 99 **Complete the following sentences.**

(a) All burns should be placed in _____for a minimum of _____ minutes.

(b) When a person has been stung by a marine stinger (box jellyfish) a _____ bandage must be applied after copious amounts of _____was first placed over the tentacles.

(c) The immediate treatment of a bleeding wound is to _____ and _____

(d) An amputated part must be put in a _____ container and then placed in _____ for immediate carriage to the hospital.

(e) A fish hook through any part of the body should be seen by a Doctor due to the threat of contracting _____

(f) If a person was to stand on a stone fish his foot must be immediately placed in _____water.

Q 100 **Answer true (T) or false (F) to the following statements.**

[ ] 1. Sea snakes are likely to attack and kill divers.
[ ] 2. You can not feel the injection of poison from a live cone shell.
[ ] 3. Vinegar is used on all jelly fish stings.
[ ] 4. Tourniquets are an acceptable treatment for bleeding limbs.
[ ] 5. The E.A.R. rate for a child is 1 breath every 4 sec.
[ ] 6. People get ciguatera poisoning because they have not cooked the fish properly.
[ ] 7. Tiger sharks are the most dangerous sharks in North Queensland waters.
[ ] 8. Hypothermia will not occur in the warm waters off Cairns.
[ ] 9. You must never touch "flame coral" as it is harmful to human health.

Q 101 Describe the method that:

(a) You would test the fit of a mask.
(b) Clears the mask under the water.

Q 102 Explain why it is sometimes useful to carry a knife while snorkelling.

Q 103 Explain the difference between regurgitation and vomiting.

Q 104 Name the instruments used to measure:

(a) Air pressure.
(b) Air speed.
(c) Air/wind direction.
(d) Temperature.
(e) Relative humidity.
(f) Rainfall.

Q 105 List the organisms which have made adaptions to the bouyancy of water and discuss these adaptions.

Q 106 Give three (3) signs and three (3) symptoms of a person in shock.

Q 107 List in the correct order, the management procedure for a person in shock.

Q 108 What are the symptoms of a severe bruise?

Q 109 Tom was on a camping trip. He was chopping some wood for the fire. The axe slipped and sliced his toe off as well as a piece of his rubber thong.

(a) How could this accident have been avoided?
(b) Describe in detail your treatment of the injury.

Q 110 Label the diagram below which shows a section through the human eye.

A _____

B _____

C _____

D _____

E _____

F _____

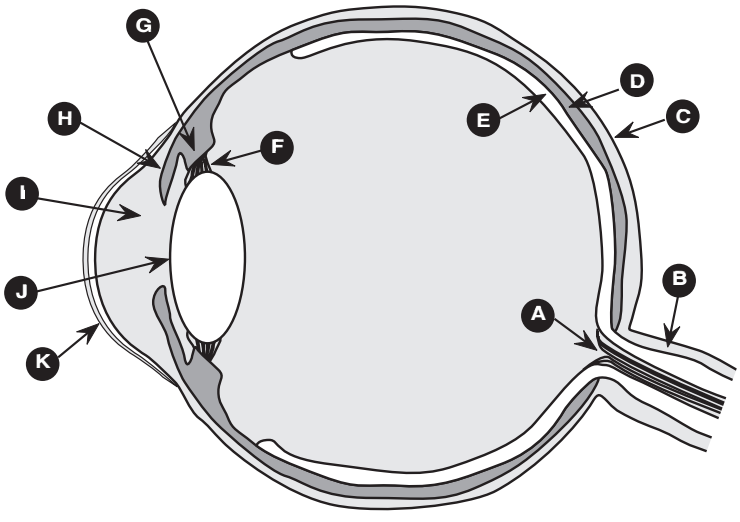
G _____

H _____

I _____

J _____

K _____



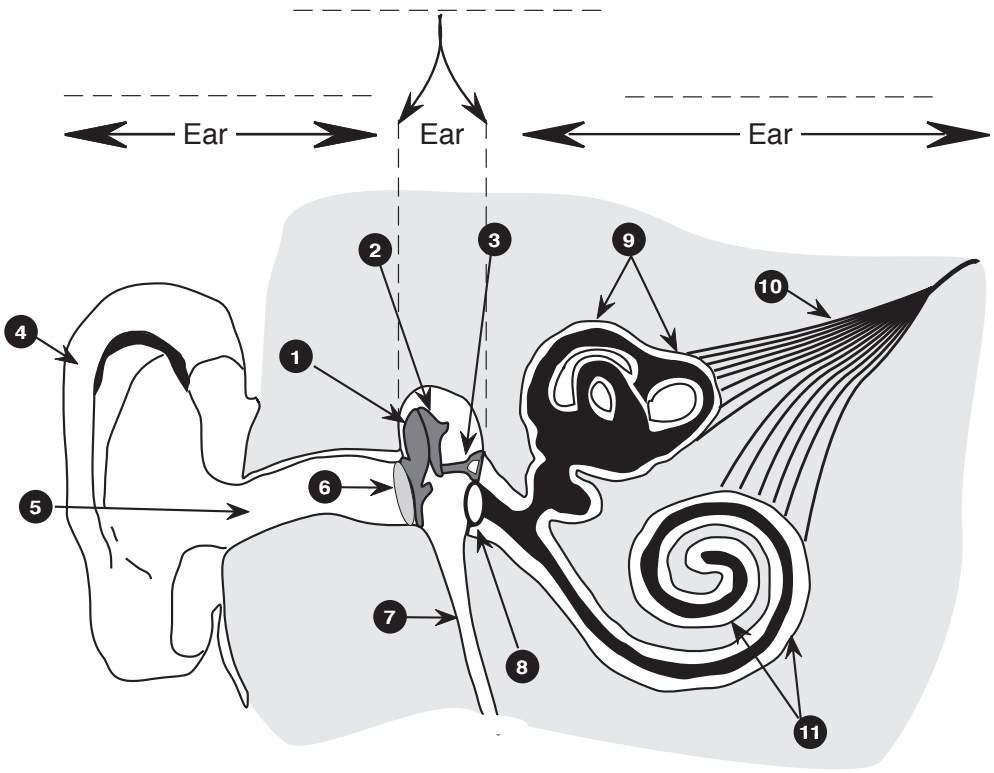
Q 111 In what way does the composition of expired air and atmospheric air differ?

Q 112 List three (3) potential dangers when entering the water in a reef situation.

Q 113 Name one of the functions of the nasal cavity.

Q 114 The diagram below shows a section through the human ear.

a. Add the missing words to show the three regions of the ear.
b. Add the missing labels.
c. Shade those areas of the diagram occupied by air.



Q 115 Give the meanings of the following terms:

a. D.R.A.B.C.
b. E.A.R.
c. C.P.R.

Q 116 What is the name of the signal that should be displayed whilst diving?

Q 117 From the following **list** of dangerous marine animals below, choose two (2) and answer the following questions.

(i) Blue ringed octopus
(ii) Stone fish
(iii) *Chironex Fleckerii*
(iv) Stingray
(v) Cone shell
(vi) Sea snake

(a) What is the animal's habitat?
(b) What is its normal food supply ?
(c) If it bites or stings a human, what symptoms do they exhibit?
(d) What is your first aid treatment in detail (in step form:- e.g. Step 1: Apply ice. Step 2: Wrap up in a plastic bag etc.)
(e) What method would you use to avoid being stung?

Q 118 If a casualty has severe pain from the sting of a box jelly fish, the casualty may fall into a state of shock.
(a) What are the four signs or symptoms of shock?
(b) How would you manage a person who has developed shock ?

Q 119 The density of water varies with depth of the water. There is pressure of one atmosphere extra for every 10 metres descended. What adaptation have marine animals made to these variations to pressure?

Q 120 Why do we require a face mask to see underwater? In your explanation outline why you see things as magnified.

Q 121 List four (4) potential dangers involved with the following situation, and give an explanation of the risk:-

It is a Sunday and you have been asked by a friend to acccompany him snorkelling at a new site he has found. Getting to the site requires a walk of two kilometres over headland and down to the boulder beach. The reef is 200m off shore but there is a strong off shore current that will help you swim to the reef. The reef is known to abound with fish and is a favourite fishing spot with the local boat owners.

Q 122 What are 4 things to be considered when making a snorkelling expedition plan?

Q 123 What are 2 physical illnesses that may endanger a snorkeller in the water? If a swimmer in the water suffers a cramp, he/she should not enter the water again until:-
(a) After 1/2 hour.
(b) After 2 hours.
(c) After 6 hours.
(d) The next day.

Q 124 Hyperventilation is caused by:-
(a) Extreme cold.
(b) Excessive heavy breathing.
(c) Surfacing too quickly.
(d) High pressure due to depth.

Q 125 The first thing you should check with an unconscious patient is:-
(a) Bleeding.
(b) Circulation.
(c) Breathing.
(d) Airway.

Q 126 Mouth to nose resuscitation is used:-
(a) If the rescuer prefers this method.
(b) During deep water resuscitation.
(c) On an infant.
(d) All of the above.

Q 127 In each situation below, outline 4 potential dangers or hazards that may be encountered by the snorkellers.
Situation 1: An excellent snorkelling reef has been found near the mouth of a river. There is a meatworks located 2 km. up-river from the mouth.
Situation 2: A group from Victoria is approaching the water's edge on a headland near Cairns in North Queensland. It is a warm, summer's day.
Situation 3: A group of community conscious Marine Studies students decide to retrieve lost watches, wallets, outboard motors, fishing gear and other valuables from the bottom of their local boat harbour (they say they are going to return them to their rightful owners).

Q 128 ***Either:***

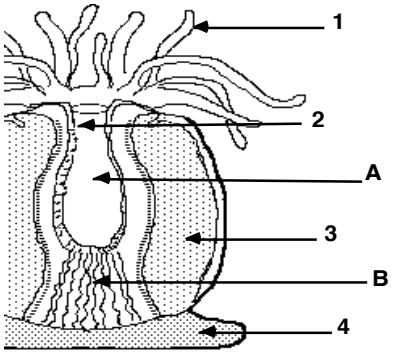
You are anchored on a shallow reef 8 Nm off Cairns. When your two friends return from snorkelling and shell collecting, one is bleeding slightly from a small and painless cut on the palm of his hand. You go to the boat's First Aid kit and prepare to treat him for a coral cut. In the meantime, his breathing becomes shallow and quick and soon after, he collapses on the deck of the boat (the 3 of you are aboard a 6m. half-cabin boat with 140H.P. outboard. It is equipped with a 27MHz radio). In the space below, outline fully your actions (first aid and resuscitation) from the time the victim collapses until you get to qualified help on the mainland).

Or

You are one of three passengers on a trawler hired for a 3 day voyage to the outer reef. Activities include fishing and trawling. The vessel is crewed by the skipper and one deckhand. The boat is fitted with modern equipment (radar, sounder , 27MHz and VHS radio) but is quite old and capable of only 8 knots. There is a small inflatable dinghy with 8 H. P outboard. The weather has become rough so the skipper decides to anchor in a sheltered lagoon. A fellow passenger decides to go spear fishing although he has no previous experience.

One or two sharks have been seen in the lagoon, attracted by the fish and prawns sorted from the trawler. Regardless of this the other passenger is determined to go spear fishing. After a short time, you hear him screaming for help and notice frenzied activity in the water about 100 metres from the boat. (wounds appear to be a mauling of the right leg with deep gashes to the thigh and knee). In the space below, outline fully your actions from the time you hear the victim's screams to the time you get him to the hospital on the mainland.

The next three questions refer to the diagram of the coral polyp below



Q129 The part labelled A best represents:-
- (a) The coelenteron.
- (b) Retracted tentacles.
- (c) The basal disc.
- (d) The corallite.

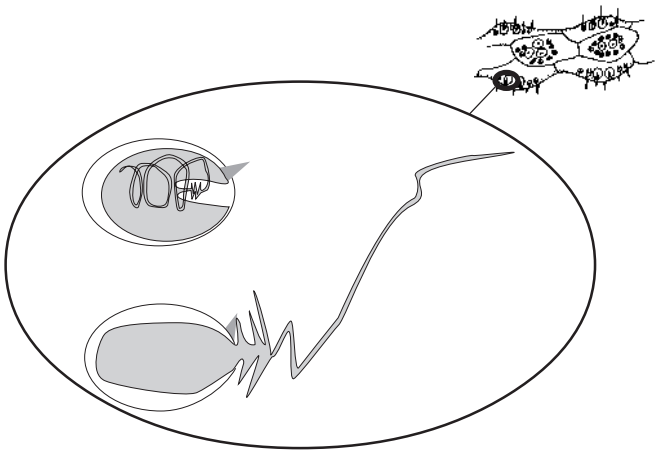
Q130 The part labelled B best represents:-
- (a) The coelenteron.
- (b) A nematocyst.
- (c) The basal disc.
- (d) The corallite.

Q131 Nematocysts would most likely be found at point:-
- (a) 1.
- (b) 2.
- (c) 3.
- (d) 4.

Q132 The egg cowrie is able to eat soft coral because:-
- (a) It has an exoskeleton which absorbs the chemical and immobilizes it chemically.
- (b) Egg cowries change the toxic chemicals in the soft corals in their digestive gland.
- (c) The cowrie eats only selective non toxic parts of soft corals.
- (d) The toxin in the soft coral breaks down inside the egg cowie automatically.

Q133 Which statement about soft corals is **incorrect?**
- (a) They are marine animals with soft bodies made up of large numbers of identical polyps connected by fleshy tissue.
- (b) They lack a hard limestone skeleton.
- (c) They use a chemical called hydrochloric acid in their chemical defence.
- (d) Some contain spicules which make them unpalatable to predators.

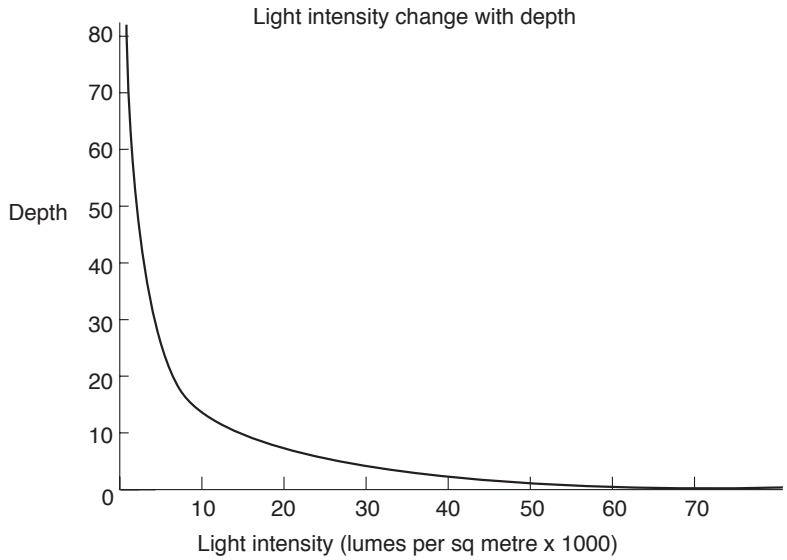
The diagram below refers to a specialised cell which has a chemical that immobilizes other animals



Q134 The cell would most likely be a:-
- (a) Barb cell.
- (b) Digestive cell.
- (c) Reproductive cell.
- (d) Nematocyst cell.

Q135 The chemical is most likely called:-
- (a) A toxin.
- (b) Calcium carbonate base.
- (c) Sulphuric acid compound.
- (d) Limestone base derivative.

The next two questions refer to the graph below



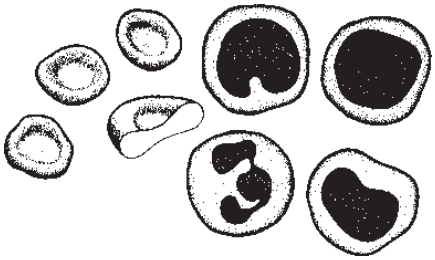
Q 136 The most significant interpretation of the above graph is that deep water organisms require adaptations for:-

(a) Moving in a dark environment.
(b) Sensing their environment.
(c) Tolerating the greater density of water.
(d) Coping with the higher pressures.

Q 137 Which of the following is a true observation about the data presented:-

(a) The concentration of ions increases with depth.
(b) The number of organisms decreases with depth.
(c) The reliance on non-visual sensory organs increases with depth.
(d) The oxygen concentration tends to decrease with depth.

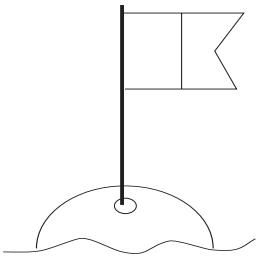
Q138 The diagram below represents that of blood cells. Mark in the red blood cells and the white blood cells.



Q 140 Now give reasons for your choice.

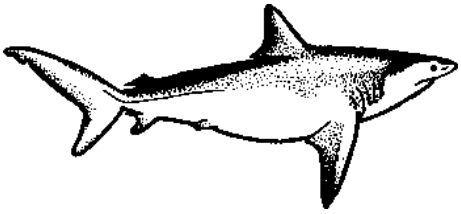
Q 141 Describe how to find the position of a victim's heart with your hands.

Q 142 The diagram to the right is that of the diving flag.
Mark on the diagram where each of the following is located:-
(a) The blue part and the white part.
(b) How big the flag should be.



Q 143 You notice a person who is showing obvious signs of drowning. You decide to take immediate action to rescue the patient. As you enter the water you see the victim's head drop in the water and when you reach her, you notice that she is lifeless. Make a list of 4 points that would go through your mind as you attempted to bring this person back to life and the reasons why you would do them.

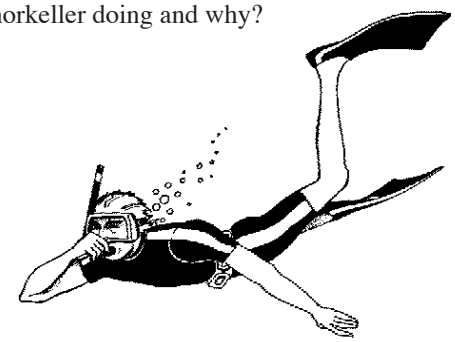
Q 144 What type of shark is this and why is it dangerous?



Q 145 What type of shark is this and why is it no longer considered dangerous?

Q 146 Identify the animal below. What precautions should be taken with this sea creature?

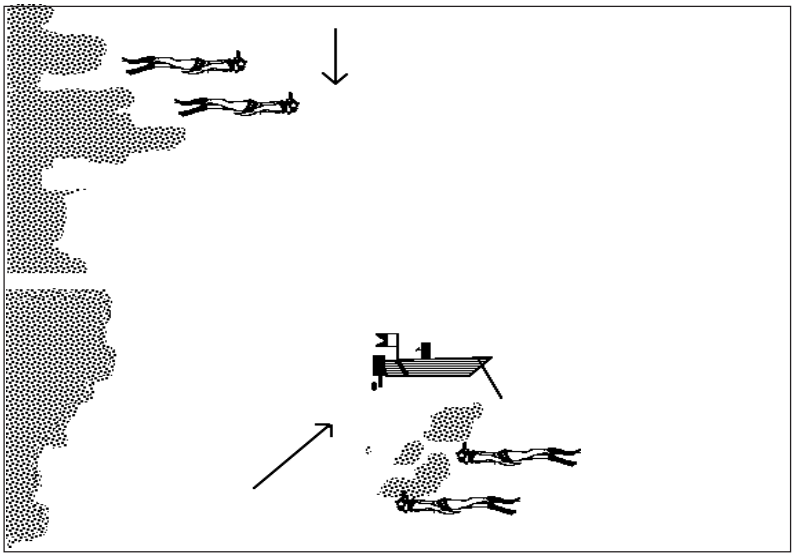
Q 147 What is this snorkeller doing and why?



Q 148 Make a list of any 4 dangerous marine organisms that you have learnt about in this course. List the potential danger and the first aid treatment associated with one of them.

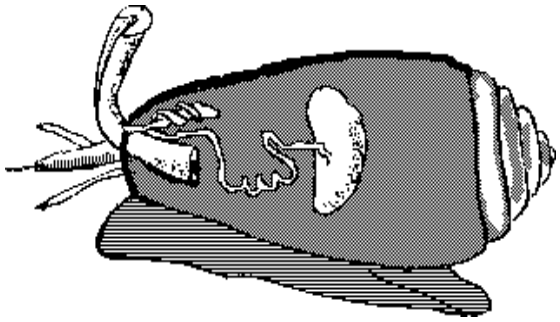
Q 149 A moray eel attacked a snorkeller's hand. Suggest two possible reasons for this.

Q 150 The diagram below is that of a snorkelling plan.



Mark on the diagram the safety equipment you would place in the water, giving reasons.

Q 151 A snorkeller died from putting this animal in his pocket. Why?



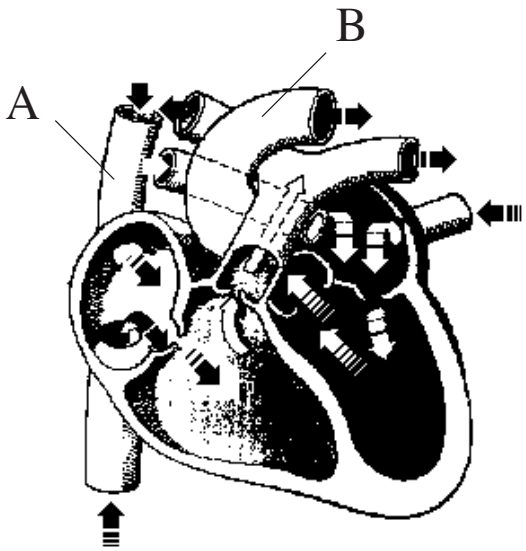
Q 152 The air we breathe is made up of .....% oxygen.
(a) 90%.
(b) 79%.
(c) 21%.
(d) 35%.

Q153 Breathing is the process by which:-
(a) Oxygen from the air is brought to the alveoli in the lungs.
(b) Carbon dioxide from the air is brought to the alveoli in the lungs.
(c) Oxygen is used by the cells to make energy for the body.
(d) Air passes to the trachea.

Q 154 Which of the following statements is **correct?**
(a) Blood carries oxygen to the cells , pumped by the heart through blood vessels.
(b) Respiration is the process where the diaphram allows air to enter the lungs.
(c) The alveoli have cartilage rings.
(d) The name for the windpipe is the oesophagus.

Q155 Which of the following is **incorrect?**
(a) Blood is a fluid containing cells.
(b) Living cells require carbon dioxide and energy providing substances.
(c) During exercise the muscles work harder and more carbon dioxide is produced.
(d) The cellular part of blood consists mostly of red blood cells.

The following TWO questions refer to the diagram of the heart below



Q 156 The vessel labelled A is the:-
(a) aorta.
(b) left pulmonary artery.
(c) superior vena cava.
(d) left ventricle.

Q 157 The vessel labelled B is the:-
(a) aorta.
(b) left pulmonary artery.
(c) superior vena cava.
(d) left ventricle.

Q158 The human blood system has.....litres of blood:-
(a) 2.
(b) 6.
(c) 18.
(d) 45.

Q 159 The major function of the alveoli are to:-
(a) Transfer oxygen and carbon dioxide.
(b) Lubricate the lung surface.
(c) Fight infection.
(d) Control the rate of breathing.

Q 160 In a two person C.P.R. resuscitation, the victim should receive 60 uninterrupted compressions each minute and 12 breaths at intervals of 5 seconds.

(a) TRUE. (b) FALSE.

Q 161 If air enters the stomach on a manakin, the chest area will rise up.

(a) TRUE. (b) FALSE.

Q 162 If the brain is starved of oxygen for more than 4 minutes, brain damage is most likely to occur.

(a) TRUE. (b) FALSE.

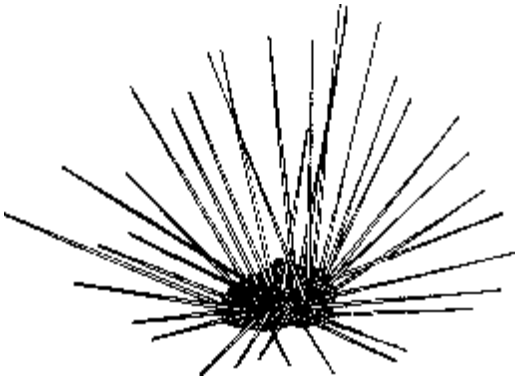
Q 163 The pulse at the side of the neck is caused by the:-
(a) Pulmonary artery.
(b) Aorta.
(c) Pulmonary vein.
(d) Carotid artery.

Q164 The treatment for a box jellyfish sting is to:-
(a) rub sand over the wound.
(b) apply methylated spirits.
(c) use an antibiotic cream.
(d) pour vinegar over the wound.

Q165 Most outer ear infections are caused by:-
(a) water being trapped behind the wax in the outer ear canal.
(b) a fungus which is found in water.
(c) bacteria which grow in the moist outer ear canal.
(d) viruses which migrate up the eustachian tube.

Q 166 A family was going on a sea trip. Which of the following would be best to take for seasickness?
(a) Lots of paper bags.
(b) Plenty of fresh fruit.
(c) Sea sickness pills.
(d) Plenty of aspirin.

The next two questions refer to the animal below



Q 167 The most injuries that the animal shown below causes is to the:-

(a) Head.
(b) Arm.
(c) Foot.
(d) Leg.

Q 168 The spines could be removed most successfully by:-

(a) A razor blade.
(b) A needle.
(c) Hot water.
(d) An antibiotic ointment.

The following statements refer to resuscitation. Read each carefully and decide which refers to what question.

A: Look for breathing movements of the lower chest and upper abdomen and listen and feel for air leaving the victim's mouth and nostrils.
B. Hold the victim's head in a backward tilt with one hand on the forehead and place the relaxed fingers on his adam's apple and then slide them gently into the groove to feel for a pulse.
C: Place the victim on his side, tilt his head back to open the airway and remove any foreign material from the mouth.
D: Immediately turn the victim on his back. While maintaining a backward head tilt and jaw support, give five full breaths of EAR in 10 seconds and then check the carotid pulse.

Q 169 CLEAR THE AIRWAY (a) A (b) B (c) C (d) D.

Q 170 CHECK FOR BREATHING (a) A (b) B (c) C (d) D.

Q 171 COMMENCE RESUSCITATION (a) A (b) B (c) C (d) D.

Q 172 CHECK THE PULSE (a) A (b) B (c) C (d) D.

Q173 Mouth to nose resuscitation should be used:-
(a) If it is the rescurer's preference.
(b) For resuscitation in deep water.
(c) When the jaw is clenched or by a child on an adult.
(d) All of the above are correct.

Q 174 In cardiopulmonary resuscitation, the rescurer should give:-
(a) 2 breaths of EAR within 5 seconds followed by 15 compressions within 10 seconds.
(b) 15 breaths of EAR within 5 seconds followed by 2 compressions within 10 seconds.
(c) 10 breaths of EAR within 10 seconds followed by 25 compressions within 40 seconds.
(d) 2 breaths of ECC within 5 seconds followed by 15 EAR within 10 seconds.

Q 175 Which of the following would be acceptable for treating a coral cut:-
(a) Clean the wound as soon as possible after the injury.
(b) Clean the wound as soon as possible after the injury and apply a local antibiotic powder.
(c) Let the wound sun dry and bandage it.
(d) Clean the wound and keep moist under a poltice bandage.

Q176 A snorkeller was leaving the water when he experienced a sharp pain in the foot. After hobbling up to the beach he noticed two small holes in the heel, swelling and severe pain. Which of the following would be the most appropiate treatment?

(a) Bandage the wound and take a aspirin.
(b) Immerse the foot in 100°C water and call an ambulance.
(c) Immerse the foot in 50°C water, apply a bandage and seek medical advice.
(d) Seek medical advice.

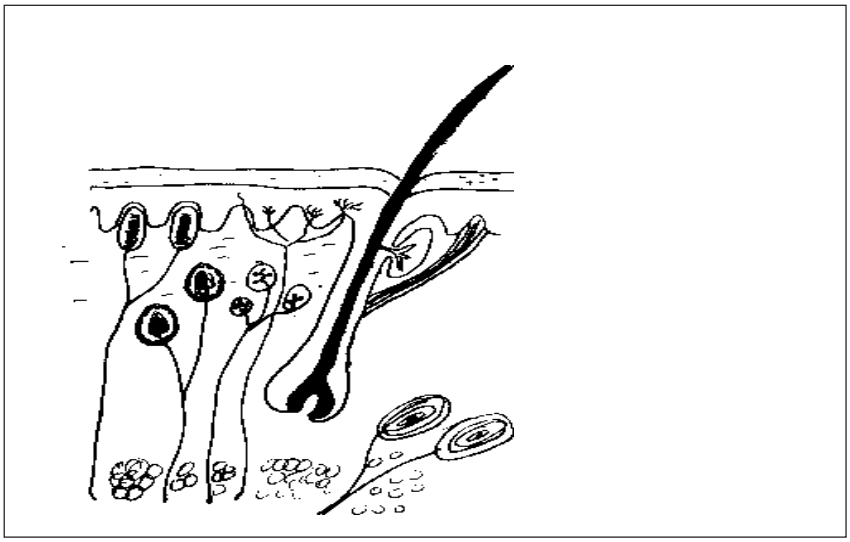
Q177 A snorkeller came running from the water with blood gushing from a leg wound. Which of the following things would you look for first in the first aid kit?
(a) Aspirin.
(b) Methylated spirits.
(c) Bandages.
(d) Antibiotic ointment.

Q178 A snorkeller speared a fish. When he took it out of the water it appeared smaller. The possible reason was that:-
(a) He got the wrong species.
(b) Looking through water magnifies objects.
(c) Looking through water makes objects smaller.
(d) He was a bad shot and missed the big one behind.

The next question refers to the diagram below of a snorkeller surfacing

Q179 What should the snorkeller be doing as he approaches the surface?

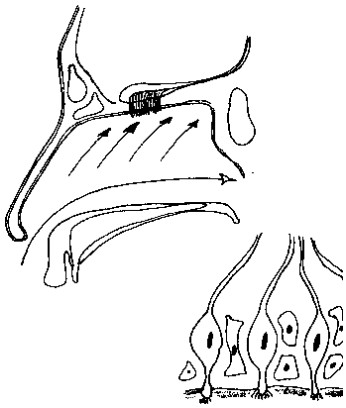
The next two questions refer to the diagram of the skin below



Q180 Mark in the diagram above where sun burn occurs and where cancer cells are most likely to form.

Q181 Mark in a sunscreen and describe which of the sun's spectral rays are affected.

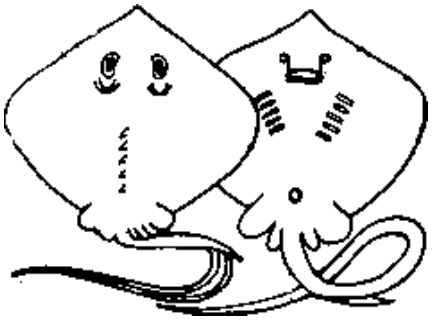
The next question refers to the diagram of the nose and associated glands below



Q182 Mark in the sinuses and describe how these are affected by a cold.

Q183 What is barotrauma and what areas of the nose can be affected?

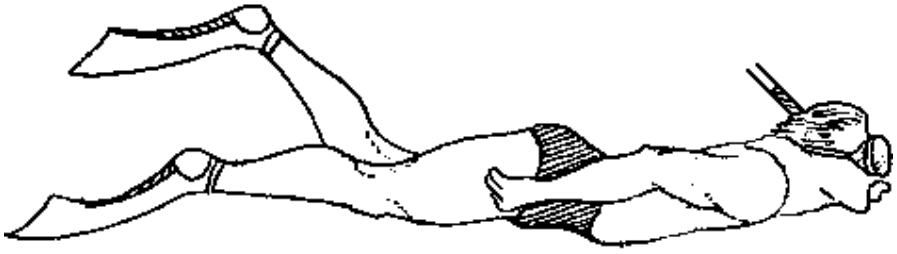
The next two questions refer to the diagram opposite



Q184 Mark the areaswhere care is needed when handling a stingray.

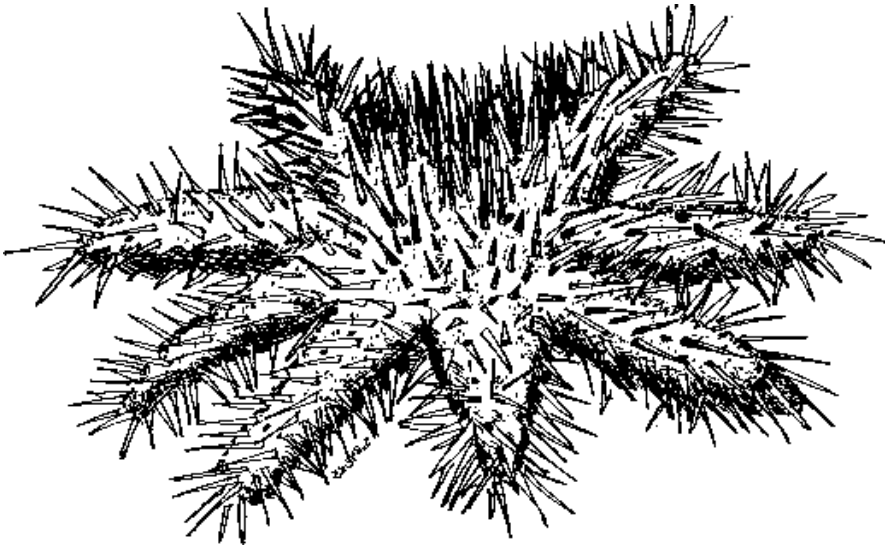
Q185 What precautions should be taken when swimming with these creatures in the sea?

The next question refers to the diagram below



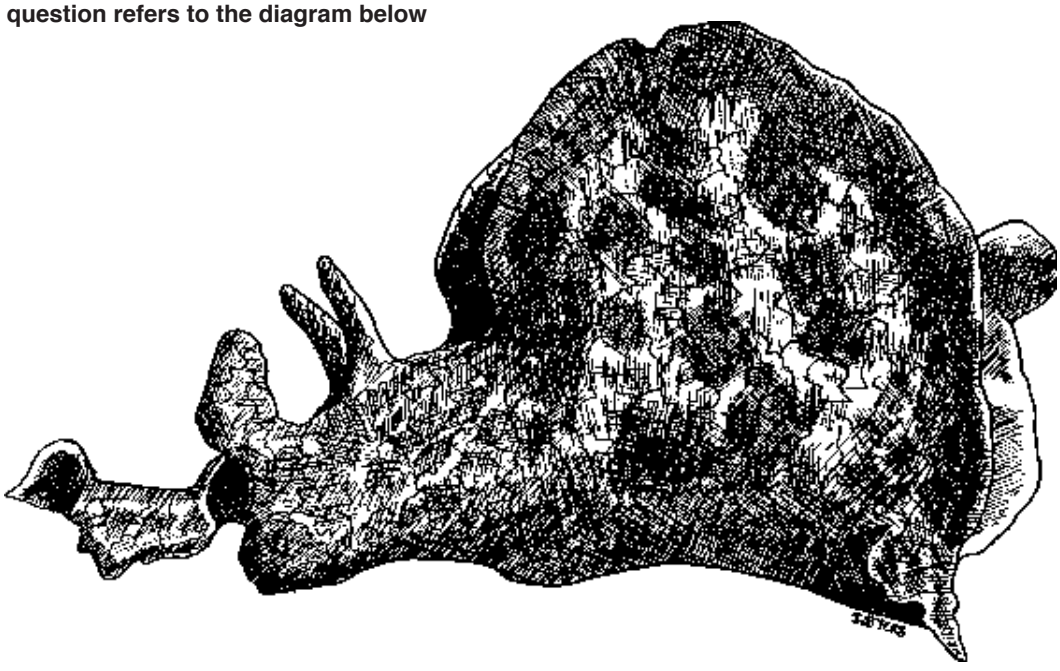
Q186 Mark in the correct method for finning and describe what the snorkeller should not do.

The next question refers to the diagram below



Q187 What is is this sea creature and what precautions shoul be taken if a snorkeller accidently stands on one?

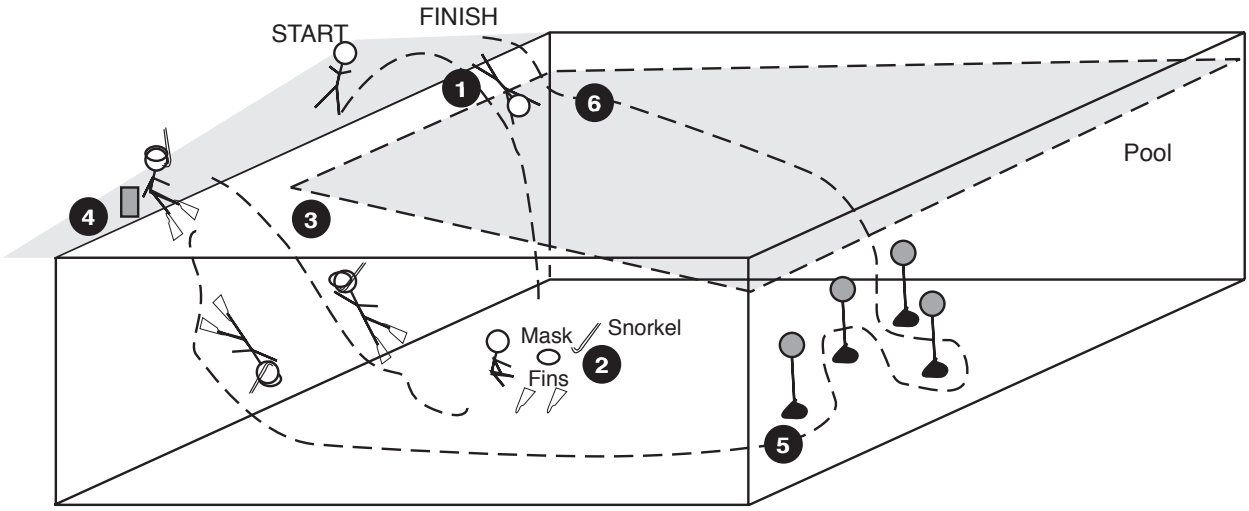
The next question refers to the diagram below



Q188 What is is this sea creature and what precautions shoul be taken by snorkellers in handling?

Q189 Practical examination

A COURSE IS SET OUT AS BELOW WITH THE MASK AND SNORKEL AND FINS ON THE BOTTOM OF THE POOL IN 2 METRES OF WATER.



On the command "go", a student enters the water at 1, retrieves and clears mask 2, demonstrates flippers and surfaces, clearing snorkel at 3.

Student then collects slate at 4 and submerges to complete obstacle course at 5 finally surfacing at 6.

Criteria:

The student will be judged on

(1) Clearance of mask and snorkel based on an A to E ranking as follows:-
- (a) Perfect - no water and all gear carried
- (b) Small amount of water in mask
- (c) Mask one third full
- (d) Mask half full, incomplete clearance of snorkel
- (e) Not successful

(2) Time to complete the course.

(3) Correct information.

e.g.

Time - Range	Ranking
65 - 70	A+
71 -76	A
77 - 82	A-

Q 190 Practical examination

Checklist transferred from teacher's markbook.

Each student is tested individually or in a small group.

1S. Selects and fits gear correctly.
2S. Enters water with a giant stride.
3S. Snorkels length of pool.
4S. Returns from the end of the pool, duck dives and swims for 5 metres underwater, clearing snorkel on surface.
5S. Exits water from side of pool.
6S. Treads water for 2 minutes.
7S. Swims 100m any stroke.

The student was then told to throw snorkel, mask and fins into the deep end of the pool. The student was instructed to enter the water, put the fins on, dive to find the mask, clear it underwater, surface and clear the snorkel and then swim to the side of the pool so that the examiner can see if the mask is cleared successfully.

8S. Recovers an object from deep water.
9S. The student can put on fins in the water.
10S. The student can put on the mask underwater .
11S. The student surfaces and clears the snorkel.
12S. The student's mask is clear.

SNORKELLING CRITERIA SHEET IDEAS

Student's Name: .....

Supervising Teacher: .....

This is to certify that the following level of achievement has been gained in this school's five week practical snorkelling program.

.....

CRITERIA

_____

☐ Swims 100 metres continuously any stroke.
☐ Selects and fits gear correctly.
☐ Enters and exits water correctly.
☐ Snorkels length of pool.
☐ Duck dives and swims for 5 metres underwater.

_____

☐ All of the above plus,
☐ Fit fins in the water and treds water for 2 minutes.
☐ Fits mask from an underwater recovery situation.
☐ Surfaces and clears a snorkel from an underwater mask and snorkel recovery situation.
☐ Recovers an object from a deep water situation.

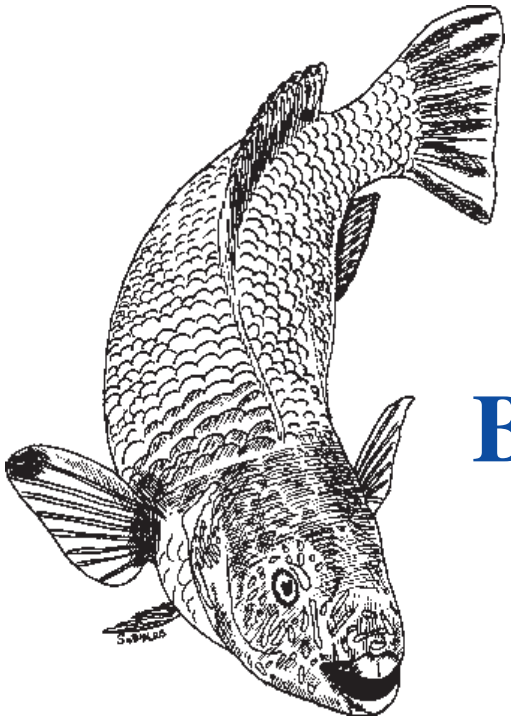
_____

☐ all of the above plus,
☐ Clears a mask completely from an underwater mask recovery situation.

....
Teacher's Signature Date

Topic 4

Exam questions



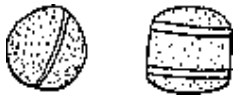
MARINE BIOLOGY

Q 1 Phytoplankton is a term used to describe:-
(a) Animals such as jellyfish.
(b) Microscopic plant drifters.
(c) All actively moving marine organisms.
(d) Microscopic plant and animal organisms.

Q 2 The process of photosynthesis:-
(a) Releases carbon dioxide.
(b) Breaks down starch to provide energy.
(c) Releases oxygen.
(d) Produces chlorophyll.

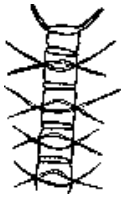
Q 3 Which of the following organisms is not phytoplanktonic?
(a) Diatom.
(b) Dinoflagellates.
(c) Prawn larvae.
(d) Algae.

The diagram below is that of a diatom



Q 4 These reproduce by:-
(a) Splitting in half.
(b) Dividing at the vacuole.
(c) Dividing at the chromatophore.
(d) Using sperm and eggs.

Q 5 The diagram to the right best describes:-
(a) A group of diatoms.
(b) Zooplankton.
(c) A mollusc larvae.
(d) Barnacle larvae.



Q 6 A Marine Biologist said he received a shipment of phytoplankters from the South Atlantic. Which of the following would best describe the depths from which these organisms were collected?
(a) 150 metres.
(b) 1000 metres.
(c) 2500 metres.
(d) 25,000 metres.

Q 7 The drawing below **best** describes the larval stage of a:-

(a) Prawn.
(b) Fish.
(c) Crab.
(d) Shellfish.

Q 8 A scientist looked down a microscope and saw the letter (e) right way up. He then looked at his microscope slide which was on his microscope. Which of the following represents what he saw on the slide when he was not looking down the microscope?

ɐ	ɔ	ə	ɞ
(a)	(b)	(c)	(d).

Q 9 The photic zone is that part of the ocean that:-

(a) Is photographically the clearest.
(b) Receives the sunlight that falls on the ocean.
(c) Supports absolutely no life.
(d) Is totally dark because it is so deep.

Q 10 All zooplankton are **best** described as:-

(a) Always microscopic.
(b) Only crustaceans.
(c) Heterotrophic.
(d) Macroscopic.

Q 11 Which form of zooplankton is most abundant?

(a) Copepods.
(b) Jellyfish.
(c) Arrow worms.
(d) Algae.

Q 12 Temporary zooplankters are **best** described as:-

(a) Plankton with the greatest chance of being eaten by marine animals.
(b) Free swimming animal life which spend some time in the plankton zone and some time in the nekton zone.
(c) Drifting microscopic animal life which become nekton or benthos in their adult stages.
(d) A sample of plankton collected and stored to be viewed under a microscope.

Q 13 Which of the following would not affect the amount of plankton in a given area?

(a) Presence of nutrients.
(b) Temperature of the water.
(c) Salinity of the water.
(d) Wave action.

Q 14 The percentage of oxygen in the atmosphere produced by plant plankton is about:-

(a) 21%.
(b) 99.9%.
(c) 80%.
(d) 47.5%.

Q 15 The group of marine organisms called the nekton include:-
(a) Plankton.
(b) Benthic dwellers.
(c) Pelagic organisms.
(d) All of the above.

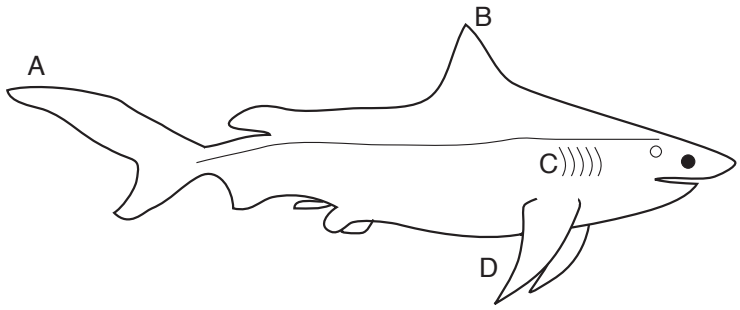
Q 16 Cartilagenous fish include all the following **except:-**
(a) Sharks.
(b) Sawfishes.
(c) Flounder.
(d) Rays.

Q 17 Sharks are not true fish because they:-
(a) Have no gills.
(b) Have air bladders.
(c) Possess a lateral line system.
(d) Possess a skeleton made of cartilage rather than bone.

Q 18 Fish with small mouths and cutting teeth are generally:-
(a) Adapted to survival where food is scarce.
(b) Plant eaters.
(c) Suckers of plankton.
(d) Carnivorous.

Q 19 A shark'Ws teeth are:-
(a) replaced whenever they are broken or worn away.
(b) of the same structure as a placoid scale.
(c) arranged in several rows.
(d) all of the above.

The next three questions refer to the diagram of the shark below



Q 20 The fins that are used for braking and steering are:-

A. B. C. D.

Q 21 The caudal fin is labelled:-

A. B. C. D.

Q 22 The gill slits are labelled:-

A. B. C. D.

Q 23 Some fish do not survive long when placed in salt water because:-

(a) Saltwater does not provide as much support for their bodies as freshwater does.
(b) Saltwater has a higher concentration of dissolved substances than the fluids in fish tissues and there is a tendency for water to pass from the tissues into the surrounding water.
(c) The salt from water tends to pass into the tissues faster than freshwater leaves it and the accumulation of the salt causes the death of fish.
(d) Saltwater does not contain as much dissolved oxygen as fresh water so fishes tend to die because of the lack of oxygen.

Q 24 Coelocanths are fish known both as fossils and living individuals that were caught off the coast of Madascar some 25 years ago. The specimens are remarkably similar in their structure to the fossil representatives of this group. The youngest known fossil is 70 million years old.

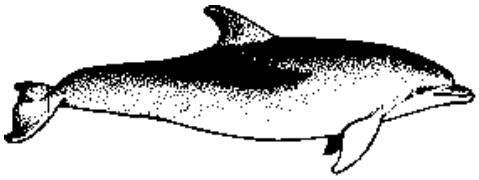
A satisfactory hypothesis to explain why coelocanths have survived more or less unchanged over such a long period of time is:-

(a) The changing environment has suited the coelocanths.
(b) The coelocanth has been able to adapt to a changing environment.
(c) The coelocanth was so successful it had no need to adapt itself.
(d) The environment of the coelocanth has not altered appreciably for a long time.

Q 25 A marine fish removed from water soon dies from lack of oxygen in its blood. The reason for this is that:-

(a) Air contains a lower percentage of oxygen than that dissolved in sea water.
(b) The oxygen in the air has a different chemical composition from the oxygen which is dissolved in sea water.
(c) The gill filaments of the fish cling together out of the water and this reduces their effective surface area.
(d) Oxygen does not diffuse into the gills because the oxygen concentration is greater in the gills than in the surrounding air.

Consider the following diagram of a Dolphin



Q 26 The overall shape of the animal is an adaptation to assisting in overcoming problems associated with:-

(a) Buoyancy.
(b) High viscosity.
(c) Upthrust.
(d) High pressure.

Q 27 Which of the following features found in fish help increase the rate of diffusion of oxygen into fish?
(a) The possession of a large number of gills.
(b) The division of gills into filaments.
(c) Having each gill structurally supported so that neighbouring gills do not touch each other.
(d) All of the above.

Q28 Which of the following is a species of baleen whale?
(a) Sperm whale.
(b) Dolphin.
(c) Pilot whale.
(d) Humpback.

Q 29 The melon is a:-
(a) Air cavity in the skull of a dolphin.
(b) Fat filled space in the forehead of a dolphin.
(c) Lump on the forehead of a dolphin.
(d) Fat filled lower jaw of a dolphin.

Q30 Krill are best described as a type of:-
(a) Phytoplankton.
(b) Zooplankton.
(c) Shrimp.
(d) Small fish.

Q31 Baleen whales have:-
(a) Large mouths, one blowhole and no teeth.
(b) Large mouths, teeth and one blowhole.
(c) Small mouths, teeth and two blowholes.
(d) Large mouths, no teeth and two blowholes.

Q32 Which of the following is **not** an adaptation of seals to their environment?
(a) Flukes.
(b) Flattened cornea.
(c) Blubber.
(d) Salty tears.

Q33 Which of the following statements about coral reefs is **incorrect?**
(a) Today's reefs are built on fossil reefs.
(b) Lagoons are often associated with patch reefs.
(c) Patch reefs always have coral cays on which turtles and birds feed.
(d) Fringing reefs are found around continental islands.

Q 34 Coral polyps are animals which belong to the Phylum:-
(a) Mollusca.
(b) Arthropoda.
(c) Cnidaria.
(d) Crustacea.

Q35 An oyster could best be described as an example of a:-
(a) Scavenger.
(b) Carnivore.
(c) Herbivore.
(d) Filter feeder.

Q36 The best reason why corals generally feed at night is because:-
(a) Zooplankters are most active at night.
(b) The mucus nets required to snare bacteria and small animals are broken down by sunlight.
(c) During the day the tentacles are withdrawn into the corallite for protection against predators.
(d) During the day the tentacles are withdrawn into the corallite for protection against dehydration.

Q 37 Characteristics such as muscular foot and internal or external skeleton belong to which phylum?
(a) Mollusca.
(b) Chordata.
(c) Porifera.
(d) Echinodermata.

Q 38 Characteristics such as radial symmetry, an internal skeleton covered by spines and skin and a water vascular system belong to which phylum?
(a) Mollusca.
(b) Chordata.
(c) Porifera.
(d) Echinodermata.

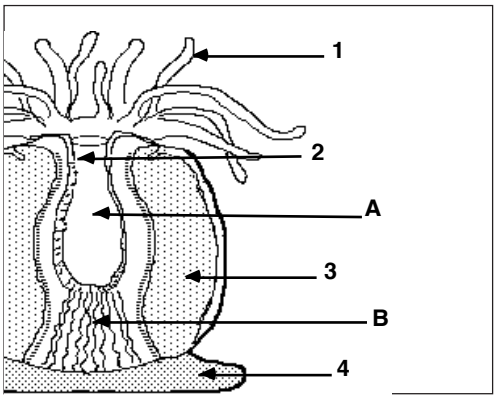
Q40 Which two of the following animals have segmented bodies?
(a) Worm and starfish.
(b) Worm and prawn.
(c) Cuttlefish and starfish.
(d) Cuttlefish and brittlestar.

Q41 Mangroves differ from terrestrial plants in that:-
(a) They do not photosynthesise.
(b) Their young are born live.
(c) Salt is excreted through pneumatophores.
(d) They have no significant use for humans.

Q42 Organisms that live on the ocean floor are referred to as:-
(a) Plankton.
(b) Nekton.
(c) Benthos.
(d) Diamateaceous ooze.

Q43 The coral polyp has been called the "architect of the reef". They are the bricks that make up the reef. The organisms that make the "mortar" would best be compared to:-
(a) Sea urchins.
(b) Algae.
(c) Crown of thorns starfish.
(d) Limestone.

The next three questions refer to the diagram of the coral polyp below



Q44 The part labelled A best represents:-
(a) The coelenteron.
(b) Retracted tentacles.
(c) The basal disc.
(d) The corallite.

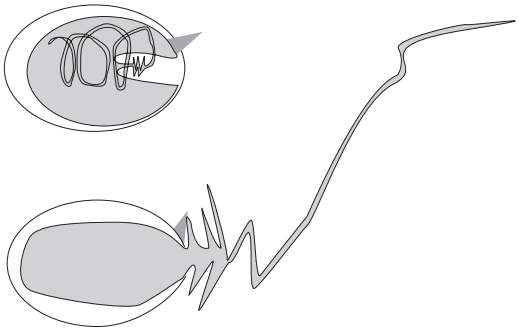
Q45 The part labelled B best represents:-
(a) The coelenteron.
(b) A nematocyst.
(c) The basal disc.
(d) The corallite.

Q 46 Nematocysts would most likely be found at point:-
(a) 1.
(b) 2.
(c) 3.
(d) 4.

Q47 The egg cowrie is able to eat soft coral because:-
(a) It has an exoskeleton which absorbs the chemical and immobilizes it chemically.
(b) Egg cowries change the toxic chemicals in the soft corals in their digestive gland.
(c) The cowrie eats only selective non toxic parts of soft corals.
(d) The toxin in the soft coral breaks down inside the egg cowie automatically.

Q48 Which statement about soft corals is **incorrect?**
(a) They are marine animals with soft bodies made up of large numbers of identical polyps connected by fleshy tissue.
(b) They lack a hard limestone skeleton.
(c) They use a chemical called hydrochloric acid in their chemical defence.
(d) Some contain spicules which make them unpalatable to predators.

The diagram below refers to a specialized cell which has a chemical that immobilizes other animals



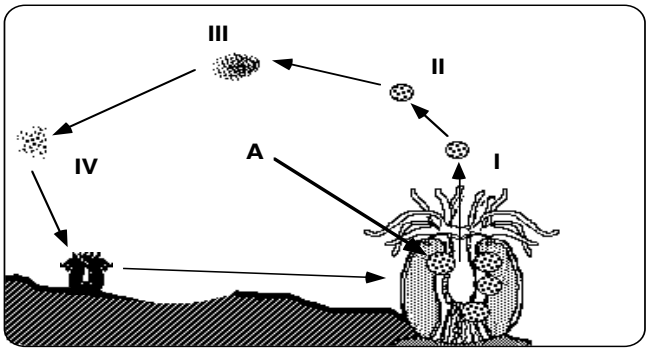
Q49 The cell would most likely be a:-
(a) Barb cell.
(b) Digestive cell.
(c) Reproductive cell.
(d) Nematocyst cell.

Q50 The chemical is most likely called:-
(a) a toxin.
(b) Calcium carbonate base.
(c) Sulphuric acid compound.
(d) Limestone base derivative.

Q51 Which of the following statements about coral polyps is **false**?
(a) There are three main types- hydrozoan, soft and stony.
(b) Zooxanthellae are animals which help the coral grow.
(c) The main food of a coral is zooplankton.
(d) They reproduce in the winter months when the water is cold.

Q52 Some corals are single sexed. The term which best describes this is:-
(a) Gonochoric.
(b) Hermaphroditic.
(c) Planulatic.
(d) Spawnosis.

The following questions refer to the diagram below



Q53 The planula stage would best be found at position:-
(a) 1.
(b) 11.
(c) 111.
(d) IV.

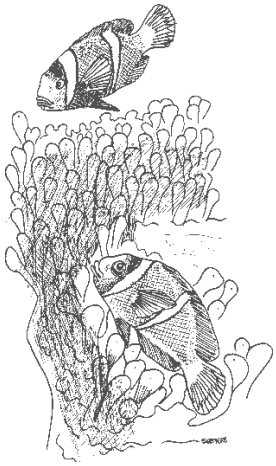
Q54 In most corals, what is produced at position A?
(a) Eggs.
(b) Eggs and Sperm bundles.
(c) Sperm bundles.
(d) Zooxanthellae.

Q55 The depth at which corals are able to grow is influenced by:-
(a) Turbidity.
(b) Sunlight.
(c) Algae (single celled).
(d) All of the above.

Q56 The most suitable conditions under which reef building corals grow would be:-
(a) Tropical waters temperature 10^0C —> 20^0C.
(b) Shallow temperate waters.
(c) Turbid waters up to 60 metres deep.
(d) Tropical waters temperature 20^0C —> 30^0C.

Q57 As a coral cay develops, *beach rock* forms when subsurface beach deposits are cemented together by:-
(a) Phosphate.
(b) Guano.
(c) Colonizing plants.
(d) Calcium carbonate.

The next two questions refer to the illustration below

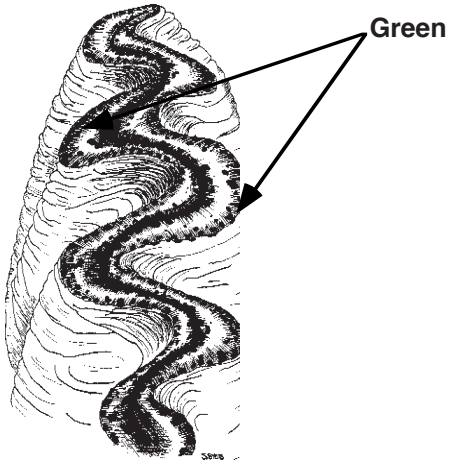


Q 58 The illustration is that of:-
(a) A goby and a shrimp.
(b) A sea perch and an algae.
(c) A clownfish and an anemone.
(d) A clam and a noddy tern.

Q 59 The relationship between these individuals is:-
(a) Parasitism.
(b) Commensalism.
(c) Symbiosis.
(d) Omnivorous.

The next two questions refer to the illustration below

Q 60 A clam shown opposite is an example of a:-
(a) Scavenger.
(b) Carnivore.
(c) Herbivore.
(d) Filter feeder.

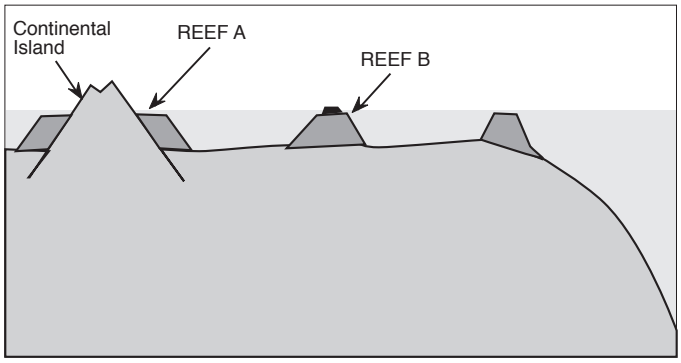


Q 61 The green parts identified on the clam opposite:- would most likely be:-
(a) Chromatophores.
(b) Zooxanthellae.
(c) Green slime.
(d) Photosynthetic bacteria.

Q 62 Choose from the following pairs, the odd one out.

(a) Sea cucumber and starfish.
(b) Goby and shrimp.
(c) Cleaner wrasse and fish.
(d) Giant clam and algae.

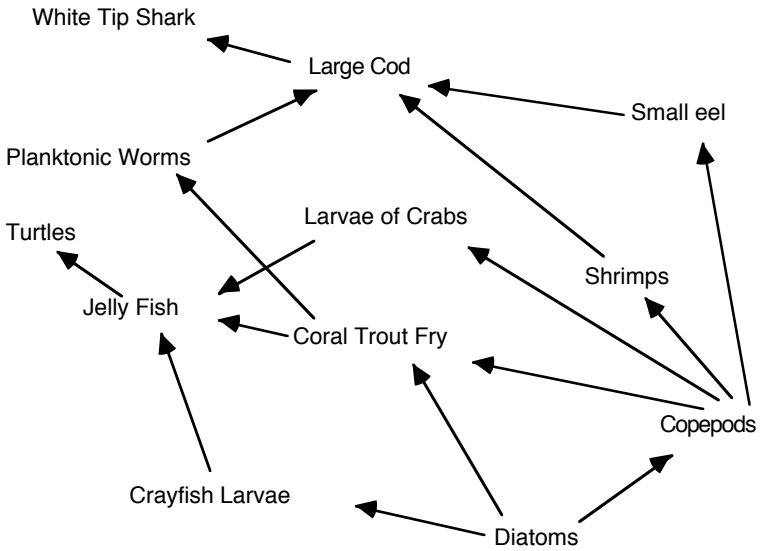
The next two questions refer to the diagram below.



Q63 Reef A grows around a continental island. Reef B grows on the continental shelf. Which reef would be most affected by rain and why?

Q64 Mark on the diagram where a ribbon reef would occur.

The following questions refer to the diagram below of a food web in a reef



Q65 Of the animals included, it is most likely that the least numerous in the region are:-

(a) Sharks.
(b) Small eels.
(c) Sopepods.
(d) Planktonic worms.

Q 66 Following a season when spear fishermen netted a large number of mature large cod in a particular area, it is **unlikely** that after a period of time, there would be an increase in the number of:-

(a) Sharks.
(b) Shrimps.
(c) Small eels.
(d) Planktonic worms.

Q 67 Periodic change is characteristic of the living reef and it involves many of the species that occur in natural communities. Examples of this type of change would **not include**:-

(a) Fiddler crabs which emerge at low tide to feed on mud flats.
(b) Corals feeding only at night.
(c) Birds feeding during the day.
(d) Corals dying after cyclones.

Q 68 The humpback whale migrates back to the Antarctic waters for summer. During this time the waters contain a large amount of nutrient salts of nitrogen and phosphorous. These support minute plant organisms known as Phytoplankton. Small, bright red shrimp-like creatures are very common: they are the krill, probably the largest herd of grazing creatures in the world. Apart from such small vegetarians, the rest of the Antarctica marine life is carnivorous. The humpbacks, seals, penguins, sea-birds, innumerable small fishes and squid fed on the krill. The squid become the favourite food of the emperor penguin and many seals. Very fierce leopard seals and killer whales prey on any creatures they can catch.

Which food chain **best** describes the above community?

(a) Phytoplankton → Krill → squid → whales.
(a) Phytoplankton → Krill → squid → fish.
(a) Phytoplankton ← Krill ← squid ← whales.
(a) Phytoplankton ← Krill ← squid ← fish.

Q 69 Detritus organisms are those which:-

(a) Migrate between benthos and plankton.
(b) Die and fall from surface waters to the benthic zone.
(c) Consume parasitic copepods.
(d) Filter feed.

Q 70 A Marine Biologist noted that after heavy February rains, the size of shrimp at the mouth of one of the rivers off the Queensland Coast near the reef region had decreased.

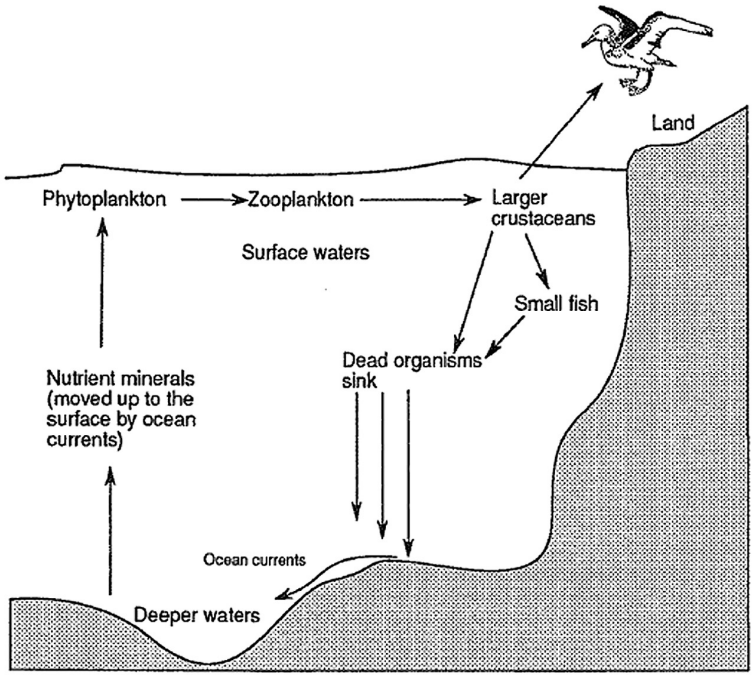
Which one of the following reasons could best account for the decrease?

(a) An increase in the depth of water reducing light intensity at the bottom.
(b) A decrease in the salinity of the water.
(c) A decrease in the oxygen concentration.
(d) A decrease in the number of shrimp predators.

Q 71 Give two reasons why corals spawn at night.

Q 72 Why is the dorsal and ventral surface of a shark a differnt shade of grey?

The next three questions refer to the diagram of the marine ecosystem below

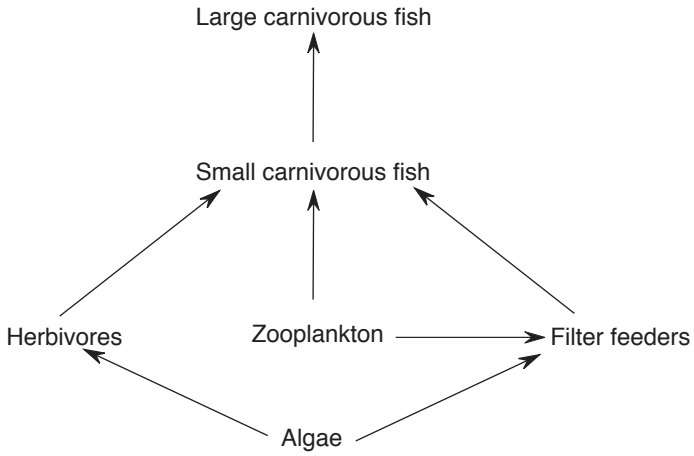


Q 73 Which is the **most likely** distribution of producer organisms?
(a) Equal numbers in the surface waters and in the depths.
(b) Many in the surface waters and few in the depths.
(c) Many in the depths and few in the surface waters.
(d) All in the surface waters.

Q 74 The mineral nutrients brought to the surface waters by the ocean currents would have:-
(a) Been released by the activities of decomposer organisms in the deep.
(b) Been dissolved out of the sand at the bottom.
(c) Sunk down from the surface waters because minerals are heavier than water .
(d) Reached the bottom by the action of ocean currents.

Q 75 If the main ocean currents were to fail and nutrients were not carried up to the surface waters, there would be a decrease in the number of:-
(a) Phytoplankters.
(b) Phyto- and zooplankters.
(c) All surface dwelling organisms.
(d) All the animals shown in the diagram..

The next question refers to the diagram below



Q 76 Which of the following statements is correct?

(a) Large carnivorous fish are dependent on algae to survive.
(b) Filter feeders must have zooplankters to survive.
(c) Small carnivorous fish obtain all their energy requirements from zooplankters.
(d) Zooplankters consume filter feeders.

Q 77 Complete the sentences. Some species of invertebrate are hermaphroditic. This means that they are:-

(a) Bisexual.
(b) Have a high fecundity.
(c) Are filter feeders.
(d) Moult at regular intervals.

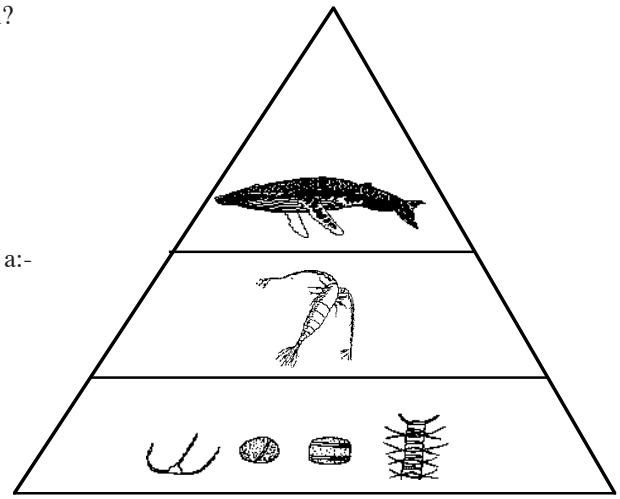
The next two questions refers to the diagram below where each energy level represents a decrease by one tenth of the available energy

Q 78 How many kilogrammes of protein can the whale extract from 100,000 kg of Phytoplankton?

(a) 10,000 kg.
(b) 1000 kg.
(c) 10 kg.
(d) 100 grammes.

Q 79 The diagram is a representation of a:-

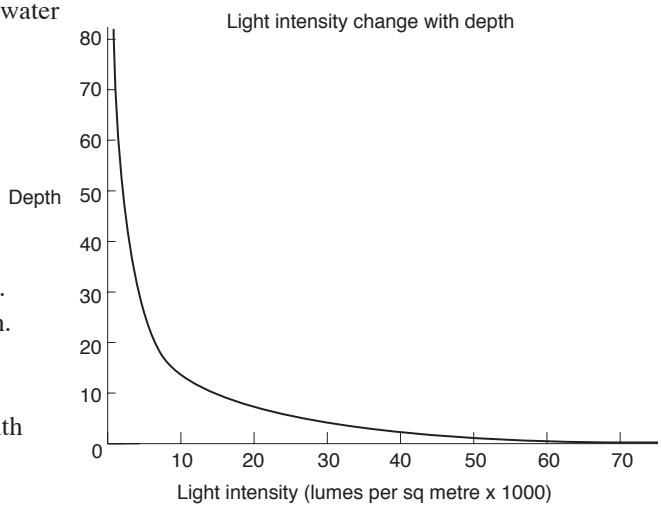
(a) Food web.
(b) Food chain.
(c) Energy cycle.
(d) Energy pyramid.



The next two questions refer to the graph opposite

Q 80 A correct interpretation of the graph, is that deep water organisms require adaptations for:-

(a) Moving in a dark environment.
(b) Coping with the higher pressures.
(c) Tolerating the greater density of water.
(d) Sensing parts of their environment.



Q 81 Which of the following is a **correct?**

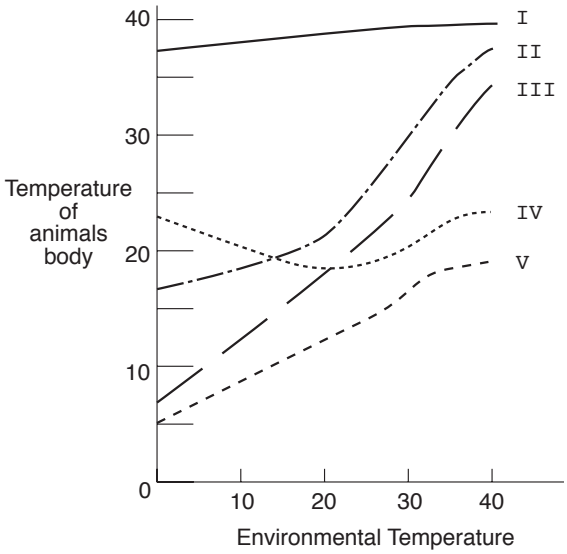
(a) Concentration of ions increases with depth.
(b) Numbers of organisms decrease with depth.
(c) Reliance on non-visual sensory organs increases with depth.
(d) Oxygen concentration tends to decrease with depth.

The next two questions refer to the diagram graph opposite and information below

Thermistors for measuring body temperature were attached to five different animals. The animals, which came from different habitats (e.g. moist soil, water, air), were kept in the laboratory. Each of the animals were kept in a habitat as close as possible to its natural one except that the temperature was varied. Each animals temperature was recorded for a wide range of environmental conditions.

Q 82 Which one of the following conclusions concerning Animal I is best supported by the data?

(a) Animal I probably lives on the land.
(b) Animal I maintains its temperature at a relatively constant level by shivering when environmental temperature is below its normal body temperature of 37^0C.
(c) Animal I is homiothermic over the temperature range 0 - 40^0C.
(d) Animal I belongs to the class mammalia.

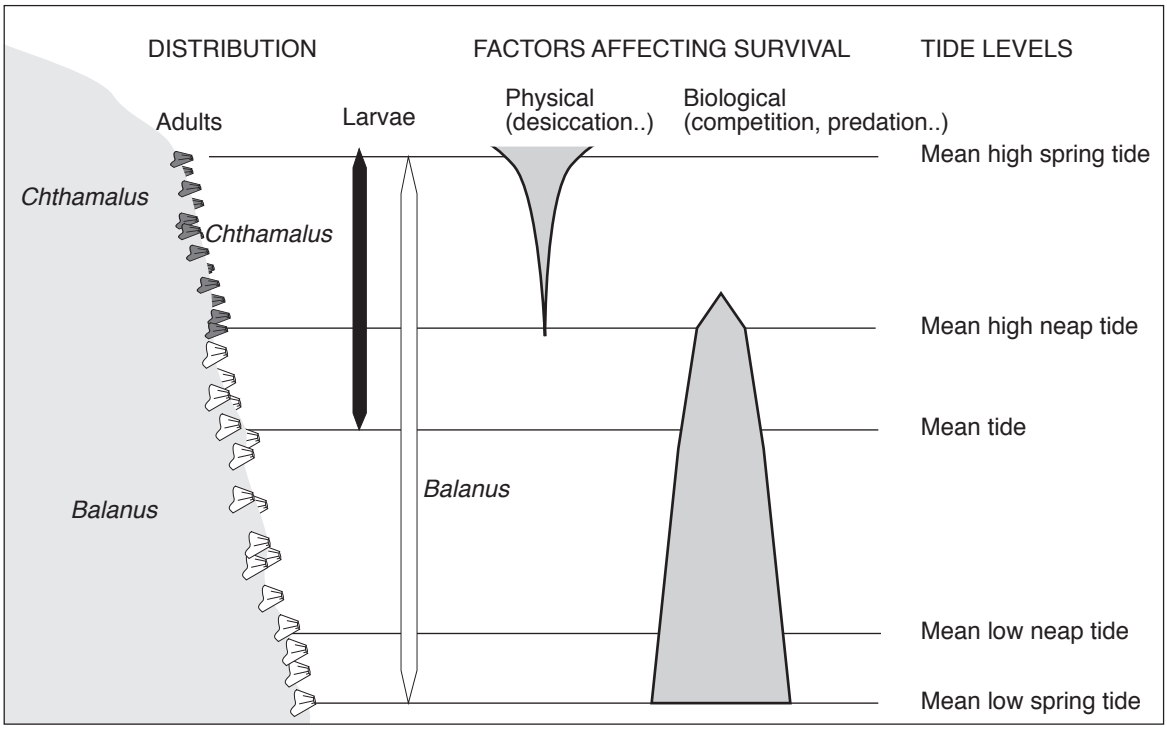


Q 83 Which is **correct?**

(a) Animal V is a whale.
(b) Animal I is a ray or shark.
(c) Animal III is a fish.
(d) Animal II is a bird.

The next two questions refer to the following information

The data shown below is from research into a study of the distribution of two species of barnacle *Balanus and Chthamalus*. The adults of each of these species have a characteristic distribution on rocky headlands. A barnacle has a planktonic larva which eventually settles on a surface of a rock and develops into an adult if the right conditions prevail.



Q 84 Which statement about the data above is **the closest to being correct?**

(a) The larvae of each species of barnacle are able to select their "settling site" on which they will grow to adult stage.
(b) Barnacle larvae will settle on a wider range of environments than adult barnacles can tolerate.
(c) Predation is a major cause of death in *Chthamalus* above mean high tide.
(d) Adult *Balanus* can reproduce above mean high tide.

Q 85 Which statement about the data above is **the closest to being correct?**

(a) The species of barnacle best able to tolerate harsh conditions of the rocky shore is *Balanus* .
(b) *Balanus* is excluded from the upper zones of the rocky shore by competition with *Chthamalus*.
(c) *Chthamalus* is able to tolerate desiccation stress but it is not an effective competitor with *Balanus* below.

Q 86 On coral reefs such as those around Heron Island, Queensland, a small striped “cleaner fish” established ‘stations’ where bigger fish come to be cleaned of their parasites. The big fish relax and open their mouths and gills and the cleaner fish feed on the parasites on the gills of the larger fish. The relationship between the cleaner fish and the parasite is:-

(a) mutualism.
(b) predation.
(c) parasitism.
(d) collaboration.

The next two items refer to the following information

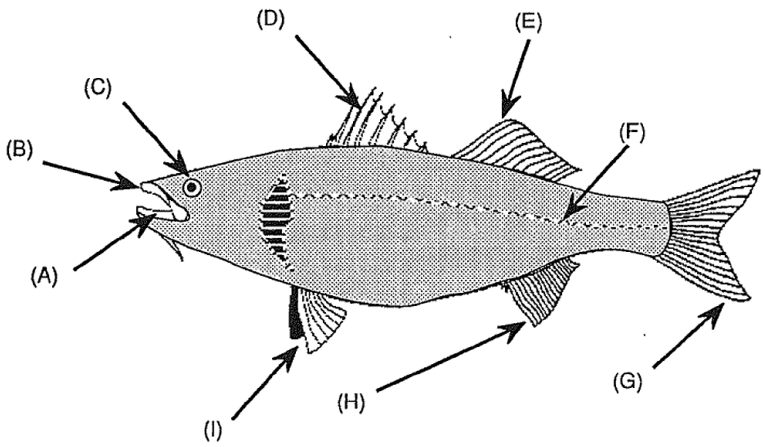
Ten 100 ml metal flasks were completely filled with sea water and sealed with caps. Each flask contained an identical quantity of phytoplankton. The oxygen concentration of the sea water used was equal to 7.82 ml/litre. After the flasks had been completely submerged for 9 hours at a variety of ocean depths, the oxygen concentration of the sea water in each bottle was measured. These results are shown below.

Depth (metre)	Temperature (^{0}C)	Final Oxygen concentration (ml/litre)
0	10.8	7.12
8 - 10	10.3	7.33
16 - 20	10.0	7.43
24 - 30	6 - 9.5	7.48
32 - 40	5 - 6.5	7.55
40 - 50	4 - 5.5	7.62

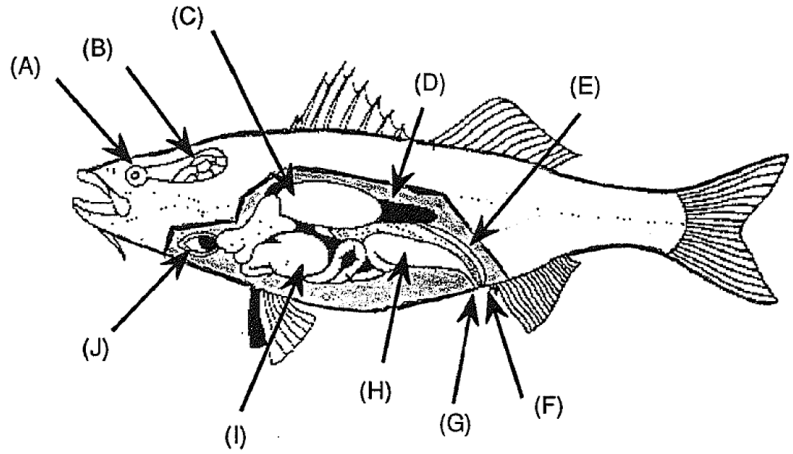
Q 87 After the 9 hours the oxygen concentration decreased in all of the flasks because:-
(a) No photosynthesiscould be carried out.
(b) Phytoplankton contain a lot of animals.
(c) Phytoplankton use oxygen.
(d) Concentrations of waste gases increased.

Q 88 The variations in final oxygen concentration with depth was **most probably** due to the variation in:-
(a) The temperature.
(b) The pressure.
(c) The light intensity.
(d) The salinity.

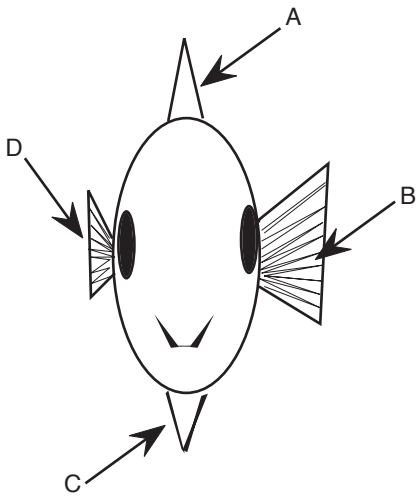
Q 89 Name the **external features** of the bony fish labelled (a) to (i) below:-



Q 90 Name the **internal features** of the bony fish labelled (a) to (j) below:-



The next three questions refer to the illustration of the fish below



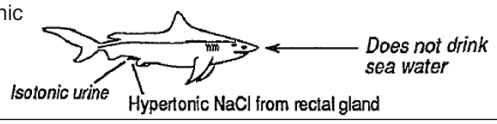
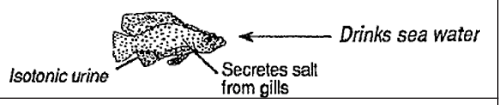
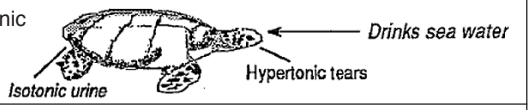
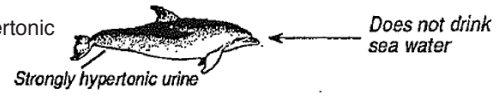
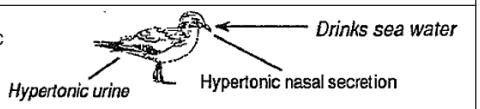
Q 91 Which fins are responsible for yawing in the fish?

Q 92 If Fin B moves backwards the fish will move:-

(a) Up.
(b) Down.
(c) To the left.
(c) To the right.

Q 93 Describe the principal function of Fin A.

The following figure illustrates the salt and water balance that controls marine organisms and refers to the following questions

Class of organisms	Susceptibility to osmotic loss	Susceptibility to water loss by evaporation	Blood Conc relative to habitat	Urine Conc relative to habitat
Chondrihthyes	✘	✘	Isotonic	Isotonic 
Osteichthyes	✓	✘	Hypotonic	Isotonic 
Reptilia	✘	✓	Hypotonic	Isotonic 
Mammalia	✘	✓	Hypotonic	Hypertonic 
Aves	✘	✓✓✓	Hypotonic	Hypertonic 
Notes	✓ Liability ✘ No Liability			Hypertonic = higher concentration Isotonic = same concentration Hypotonic = lower concentration

Q 94 Which statement about the data above is **the closest to being correct?**

(a) Skin of marine mammals is permeable to water but not permeable to salt.
(b) Organisms which drink sea water have an internal salt concentration which is the same as sea water and therefore do not excrete salt.
(c) Marine reptiles are well suited to life in salt water because there is not nett diffusion of either water or salts into or out of these organisms.
(d) Survival of vertebrates in marine environments is aided by their availability to transport salt against a concentration gradient.

Q 95 Discuss the problems a shark would face when entering an estuarine system. In particular, what problems would it experience as the water became less saline?

Q 96 Give any one reason why a dolphin would die if placed in a freshwater swimming pool.

Q 97 Why do sea gulls secrete salt from their noses?

Q 98 Why don't dolphins drink sea water?

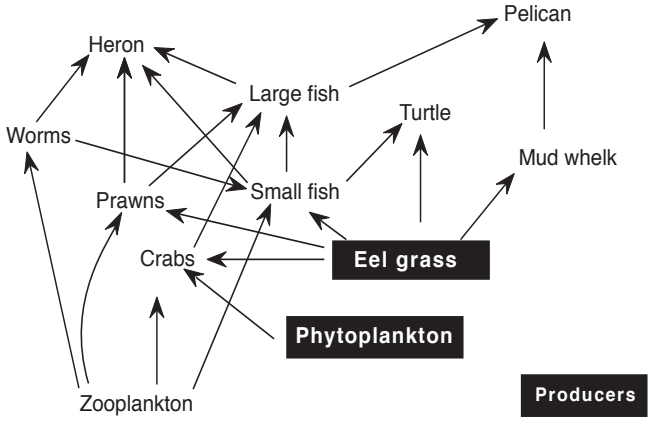
Q 99 Why are sea gulls very susceptible to water loss by evaporation?

The next two questions refer to the diagram opposite

Q 100 Which of the animals is most likely to be least numerous in this region?

Q 101 Draw a food pyramid including five (5) organisms shown on the food web, listing animals which are producers and consumers.

Complex food web of a mud flat.



Q 102 In a food chain very little energy is converted to biomass. What happens to the energy not used to produce biomass?

The next three questions refer to the following information

* Larva and copepods eat diatoms and dinoflagellates.
* Humpback whales eat diatoms and dinoflagellates.
* Small fish eat diatoms and dinoflagellates.
* Humpback whales, herring, eels and dolphins eat small fish.
* Sharks eat whales, herring and dolphins.
* Orcas eat dolphins, sharks, herrings and whales.

Q 103 Construct five (5) food chains.

Q 104 Give an example of each of the following:
(a) A herbivore.
(b) A producer.
(c) A carnivore.
(d) A 2nd order consumer.
(e) A 4th order consumer.

Q 105 Construct a food web using all of the organisms in the information above.

Q 106 Zooplankters are termed heterotrophic. Explain this statement.

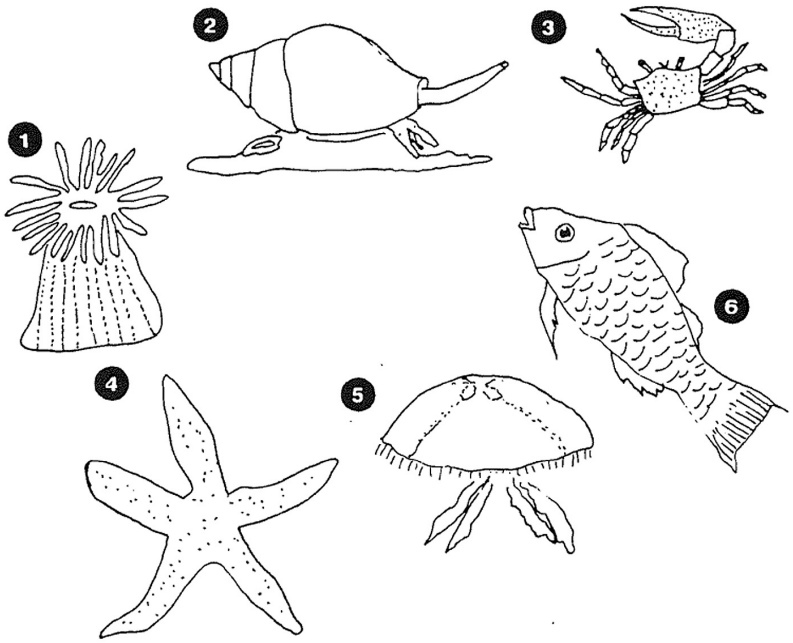
Q 107 Distinguish between these pairs of terms:-
(a) Catadromous/anadromous.
(b) Parasite/host.
(c) Herbivore/carnivore.
(d) Symbiosis/consumer.

Q 108 What are ***zooxanthellae*** and how do they help coral polyps?

Q 109 Explain the difference between anerobic and aerobic respiration.

The next question refers to the six illustrations below

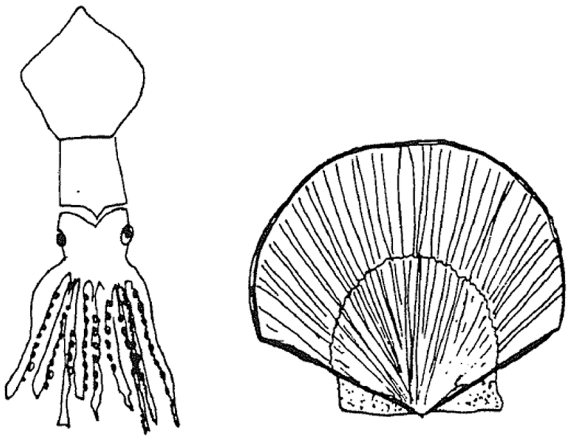
Q 110 How would you classify the above organisms? Give reasons for your answer including mention of the following:- Phylum, body symmetry, phylum characteristics.



The next two questions refer to the two illustrations below

Q 111 To which phyla do these animals belong?

Q112 Both organisms are in the same phylum. Why?



Q 113 Explain why sharks are not true fish.

Q 114 How are fish able to:-
(a) detect sound in water?
(b) change the depth at which they are found?
(c) get rid of excess salt?

Q 115 Many fish that are caught on the Australian coast have a legal minimum size.
(a) Why would you suggest these size limits should be imposed?
(b) How do you believe these sizes are determined, as a minimum size limit varies from species to species?
(c) Why do you believe some species have no size limit. Give some examples of fish which have no minimum size limit.

Q 116 Size limits are in some places replaced by bag limits. Where does this occur and why the change?

Q 117 Two types of whales are Baleen and Toothed. Describe the type of food consumed by each and how it is captured?

Q 118 Explain, with the aid of a diagram, how echolocation works in the dolphin.

Q 119 Give three reasons why the migration of whales to tropical waters each winter helps them survive.

Q 120 Do whales feed while migrating? Do you believe tourism will effect the migration of whales?

Q 121 List three ways in which blubber is useful to whales.

Q 122 Give three theories for whales beaching themselves in large numbers.

Q 123 The next question is a matching one. Place the statement's letter next to the correct term.

Term	Letter	Statement
Primary productivity	[ ]	A. Organism that live on the refuse of a community
Habitat	[ ]	B. Set of interactions among organisms
Community	[ ]	C. Total amount of energy converted by a primary producer
Detritivores	[ ]	D. The place in which individuals of a particular species are found
Food Web	[ ]	E. Association of interacting populations

The next question refers to the following food chain

Diatom ----> crustacean ----> herring ----> dolphin

Q 124 Name the:-
(a) Herbivore.
(b) First order consumer.
(c) Second order consumer.
(d) Primary producer.

The next question refers to the following information:-

"Marine organisms are adapted to life in their habitat in such a way that they have a reasonable opportunity to survive and reproduce. The most obvious adaptation is to salinity and light availability."

Q 125 From your observations and understanding of marine adaptations, suggest reasons or hypotheses as to why:-
(a) Marine organisms tolerate high salt concentrations.
(b) How some organisms survive beyond the photic zone.
(c) How organisms overcome the viscosity of water.

Q 126 When the Great Barrier Reef was zoned, a multi-user plan was used. Why was this approach adopted and what methods were employed to achieve these goals?

"The structure of a reef is determined by a complex interaction of forces. This makes it difficult to say whether a reef is growing or not."

Q 127 Comment on the accuracy of this statement using specific examples to illustrate your answer.

Q 128 The nitrogen cycle has three principle stages. Describe these in detail.

Q 129 In 200 words or less, discuss the Greenhouse effect with specific reference to the marine environment.

Q 130 Why does it take such a long time from the discovery of a drug to its release onto the market?

Q 131 What effect would the introduction of a particular species from a different community have over a natural population ?

Q 132 After the second world war, scientists began to develop synthetic chemical insecticides. They developed the chlorinated hydrocarbons such as DDT and Dieldrin. These chemicals were very effective in controlling insects but were eventually banned.

(a) Why?
(b) What steps should be taken if history is not to be repeated?
(c) Who should pay for the clean up?

The next five questions refer to the table below

Variable	Position 1	Position 2	Position 3	Position 4	Position 5
Water quality by Secchi disc (cm)	200cm	10cm	12cm	60cm	150cm
Temperature	22.3^{0}C	26.2^{0}C	25.1^{0}C	25.0^{0}C	24.2^{0}C
Oxygen content	8.5 ml/l	1.0 ml/l	0.5 ml/l	3 ml/l	4 ml/l
Fish	Yellow Belly Catfish Mullet	Mullet	Nil	Catfish Mullet	Catfish Mullet
Mineral ions concentration	Low	High	High	High	High.

Q 133 Organisms which can only live in special environmental conditions are said to be indicator species. These organisms have a low tolerance range. Which of these species is an *indicator species*?

(a) Catfish.
(b) Mullet.
(c) Yellow belly.

Q 134 Why will the oxygen concentration decrease as you progress from position 1 to position 5

Q 135 Discuss the water clarity, based on secchi disc readings, from position 1 to 5. What may have happened between position 1 and 2.

Q 136 What effect might the increase in mineral ion concentration have on the aquatic life from positions 3 to 5?

Q 137 How might the building of dams and water resource reservoirs affect the abiotic condition found in waterways?

The next four questions refer to tables 1 and 2 below

TABLE 1

Farm	Pond Size (ha)	Species 2	Total annual yield (kg)	Annual production costs ($/ha)	Sale Price ($/kg)
1	40	Marron	33,000	$1,850	$9.00
2	25	Murray cod	70,000	$1,100	$5.00
3	35	Yellow belly	67,000	$900	$5.50
4	40	Golden perch	80,000	$800	$4.00

TABLE 2

Species	Water Temp tolerance	pH	Growth rate in 12 months (cm/yr)	Eating quality	Pollution effect
Marron	15 - 25 ^{0}C	neutral	15	excellent	high
Murray cod	2 - 30 ^{0}C	neutral	30	good	fatal
Yellow belly	4 - 47 ^{0}C	neutral	22	good	low
Golden perch	10 - 30 ^{0}C	6.0 - 8.5	28	good	fatal

Q 138 What facility will provide the largest profile for a year? Show all working.

Q 139 If all these facilities are in your local area, which would you choose to purchase? Give an explanation for your answer.

Q 140 Some invertebrates are suited to mariculture. Farms are now being given more emphasis as they are more energy efficient and have greater productivity. Suggest 2 reasons for this development.

Q 141 Outline three reasons (explain in detail) why aquaculture is becoming more and more a viable solution to the decrease in numbers of fish in Australia's freshwater environment.

Q 142 Many reef fish are very colourful. Suggest 2 possible reasons why this is so.

Q 143 Turtles, whales and sharks belong to the one phylum, Chordata. This is because they all:-
(a) Have bones.
(b) Have a spinal chord.
(c) Are warm blooded.
(d) Live in water.

Q144 What is the main difference between plankton and nekton?

Q145 Why does a shark have to swim continuously to maintain a constant depth?

Q 146 Give 2 reasons why some organisms can survive the extreme pressures of the ocean depths.

Q147 What physical characteristic do most free-swimmers possess that helps them to overcome water viscosity?

Q148 The producers in the surface waters of the ocean are the:-
(a) Phytoplankton .
(b) Pelagic organisms.
(c) Zooplankton .
(d) Copepods.

Q149 List 3 basic differences between a shark and a bony fish.

Q150 Coral reefs do not extend further south in Queensland because:-
(a) The water is too cold.
(b) The sunlight is not strong enough.
(c) The food of corals only occurs in North Queensland waters.
(d) There are more coral predators further south.

The following questions relate to corals.

Q151 (a) What is the name of the organism that lives in the body wall of the coral?
(b) What type of relationship does this organism have with the coral?
(c) What contribution do they make to each other (if any)?

Q 152 What is the difference between a structural and behavioural adaptation in fish. Give three examples of each.

Q 153 Why do barramundi change sex during their lifetime?

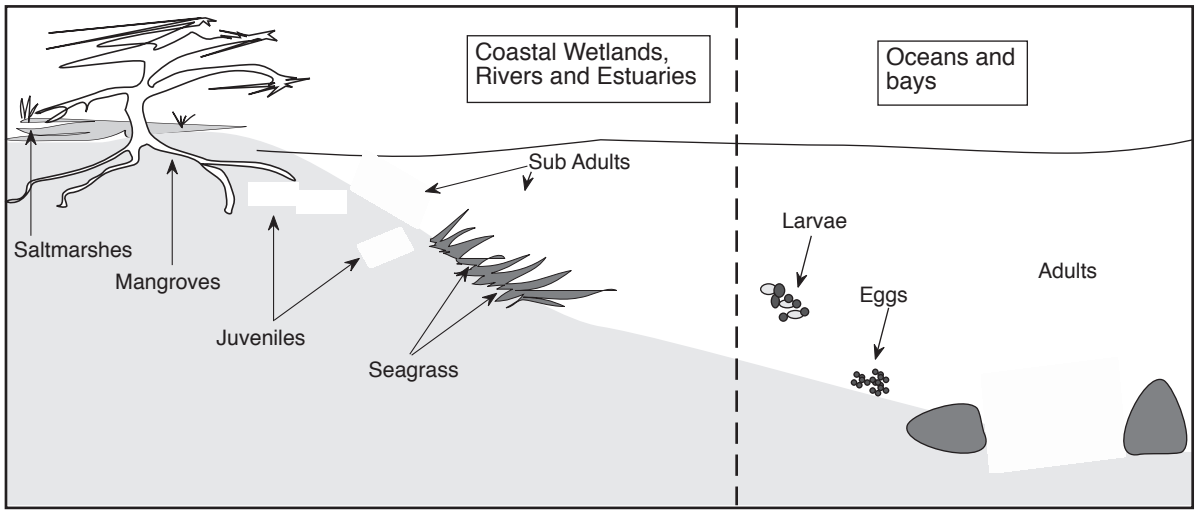
Q 154 List two reasons why sharks loose their teeth.

Q 155 Why is the mouth of a stingray on the ventral surface?

Q 156 Why do polychaete worms need burrows to survive?

Q 157 Many estuarine species only spend part of their lives in estuaries and the rest in oceans and bays.

(a) Add the arrows to the diagram below to show the migratory pathways of these species.

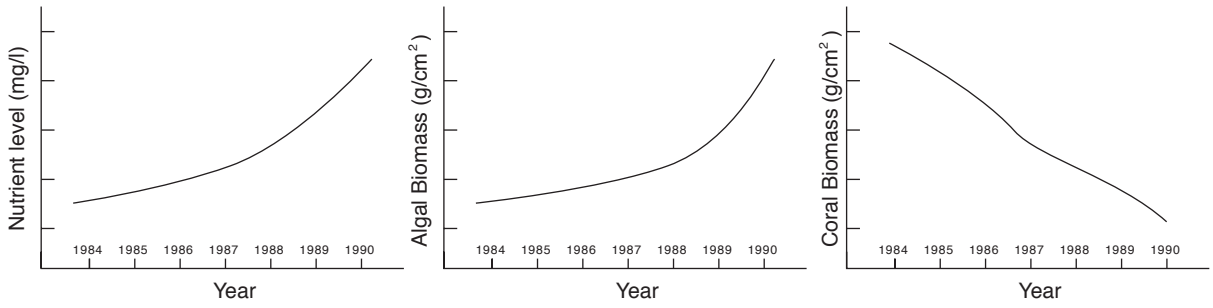


(b) Explain the stages in this migratory pathway (starting from the open waters).

The next question refers to the information and graphs below

Q 158 A certain coral reef has been monitored over a period of 20 years. Data for the first 15 years showed that the average growth rate for the reef was 8cm per year. Six years ago, clearing and developing of the nearby mainland resulted in the river carrying more sediment than in the past, clouding the ocean out to sea. The average growth rate of the reef over the last 5 years is 3cm per year.

The graphs above show the changes in nutrients and biomass of the coral and algae on a fringing continental reef over the last 5 years.



(a) How do you explain this change in growth rate?

(b) How do you account for:
(i) The change in nutrient levels.
(ii) The change in algal biomass.
(iii) The change in coral biomass.

Q 159 What are 2 effects of the lack of light on marine organisms living in the ocean depths?

Q 160 From this list, select the organism that best fits the statement below.

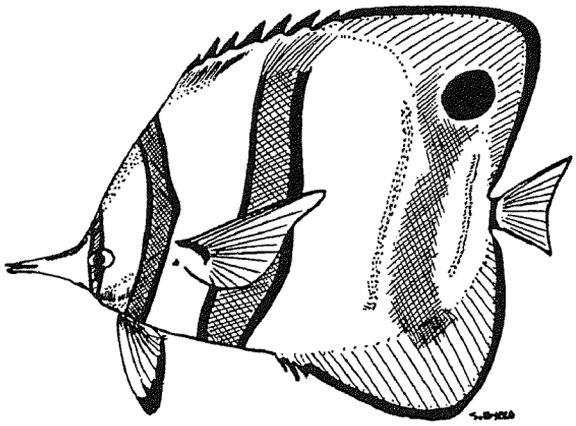
(kelp, sea cucumber, starfish, coral, flathead, blue bottle)

(a) The rich detritus of the mud flats suits the _____
(b) _____ are common in reef areas because they feed on the plentiful molluscs.
(c) Adequate water circulation is necessary to bring food to and remove waste from _____.

Q 161 Name the relationship that exists between the following organisms:-

(a) Shark and remora (sucker fish).
(b) Sponge growing on a crab.
(c) Coral trout and cleaner fish.
(d) Small crustacean between the scales of a fish.

Q 162 Examine the picture of the fish below. This fish lives on a coral reef, feeding on food between coral growths. Identify 4 structural adaptations possessed by this fish and discuss how each adaptation helps in its survival.



Q 163 Suggest two reasons why corals spawn in November at a certain time after the full moon each year.

Q 164 Coelacanths are a rare species of fish, previously believed to have been extinct for millions of years. Recently a number of specimens have been caught and brought up from the abyssal depths. To date, none has been brought to the surface alive. How do you explain this?

Q 165 The majority of marine animals show external fertilization with a minority showing internal fertilization.

(a) Explain the terms external and internal fertilization (with examples).
(b) Give an advantage and a disadvantage for each method of reproduction.

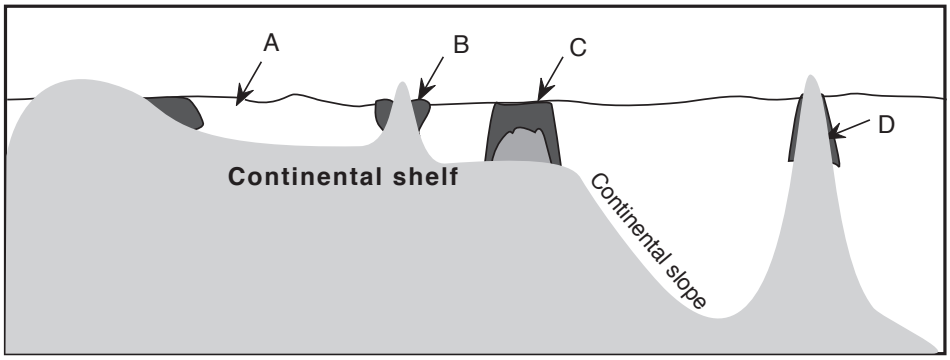
Q 166 Coastal wetlands/estuaries have a detritus based food web with a secondary planktonic based food web. Coral reefs on the other hand, have a planktonic based food web with a minor detritus based food web.

(a) What is meant by this statement?
(b) Why do you think the planktonic food web is dominant in the reef ecosystem yet minor in an estuarine ecosystem?

Q 167 From each of the descriptions below, discuss how each animal may be effected by the other and name the type of relationship between them.
(a) Pilot fish swim just ahead of a shark. The shark never eats them.
(b) A certain type of crab carries a small anemone on each of its front claws.
(c) Another type of crab carries a living sponge around on its back.

Q168 Some fish are very territorial. They tend to remain in one area of reef throughout their lives. Describe what might happen to the fish population on an isolated reef if all the cleaner fish were wiped out by a mysterious disease.

The following question refers to the diagram below



Q169 Name the structures (a) to (d) in the diagram above.

Q170 Name three conditions essential to coral growth.

Q171 Name two coastal landforms formed by erosion.

Q172 Algae and sea grass both have:-
(a) Chlorophyll.
(b) Leaves.
(c) Stems.
(d) Vascular tissue.

Q 173 Describe the habitat of a cleaner wrasse.

Q 174 What are the features of the Decapoda that distinguish them from other groups in the Phylum?

Q 175 Give two examples of Decapods.

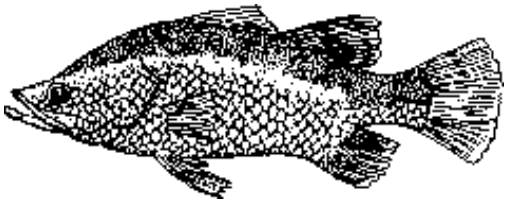
Q 176 Which of the following is not a requirement of phytoplankton during daytime?

(a) Carbon Dioxide.
(b) Oxygen.
(c) Water.
(d) Nutrients.

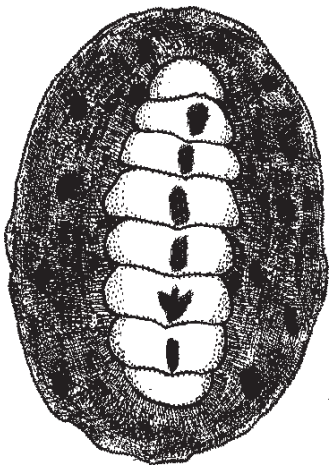
Q 177 Give an example of an animal that displays radial symmetry.

Q 178 Give one example of an animal that displays bilateral symmetry.

Q 179 What is the name of this fish and what is unusual about its life cycle?



The next two questions refer to the illustration below

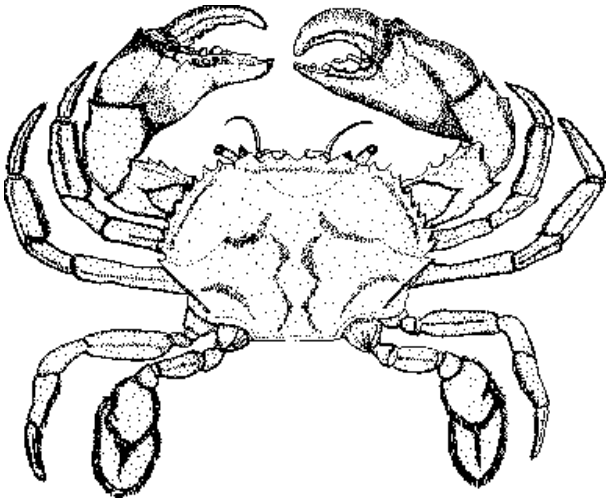


Q 180 The animal is a:-

(a) Sea slug.
(b) Sea urchin.
(c) Type of clam.
(d) Chiton.

Q 181 This animal is found on the rocky shore and is exposed to heat and waves. List two structural adaptations that enable it to withstand this environment.

The next three questions refer to the diagram below



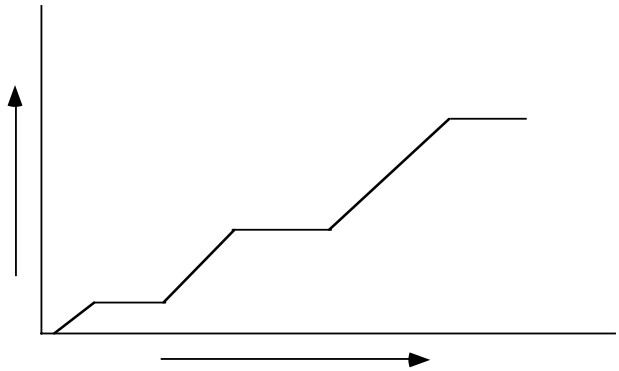
Q 182 The animal belongs to the class:-

(a) Arthropoda.
(b) Crustacea.
(c) Decapoda
(d) Echinodermata.

Q 183 The animal is:-

(a) Radially symmetrical.
(b) Bilateral symmetrical.
(c) Amorphic
(d) Metamorphic

The graph below is that of the animals growth with size on the y axis and age on the x axis



Q 184 Why is growth not a curve for this animal?

Q 185 Mangroves provide an excellent habitat for many marine animals because they provide:-
(a) Shelter for organisms.
(b) Breeding places.
(c) Food.
(d) All of the above.

Q 186 Bony fish can remain still in water while some sharks have to keep swimming. This is because bony fish:-
(a) Have swim bladders.
(b) Are lighter.
(c) Can gulp air at the surface.
(d) Are less dense.

Q 187 Which of the following is a Chordate?
(a) Barnacle.
(b) Turtle.
(c) Starfish.
(d) Octopus.

Q 188 Turtles belong to the class:-
(a) Reptilia.
(b) Mammalia.
(c) Osteichthyes.
(d) Chondrihthyes.

Q 189 The removal of mangroves and the destruction of our coastal wetlands have been described by some as ridding our habitated areas of mosquito infested swamps.

Give six reasons why mangroves are important as well as your opinion on their destruction.

Q 190 Discuss two effects of floods on the organisms that live offshore on reefs or islands.

Q 191 Give two reasons why is it more productive to farm food from the land rather than from the sea.

Q 192 What is the difference between mariculture and aquaculture?

Q 193 The most commonly grown crustaceans are:-
(a) Freshwater crayfish.
(b) Oysters.
(c) Mussels.
(d) Red claw.

Q 194 Describe in three sentences the stages in the culture of barramundi.

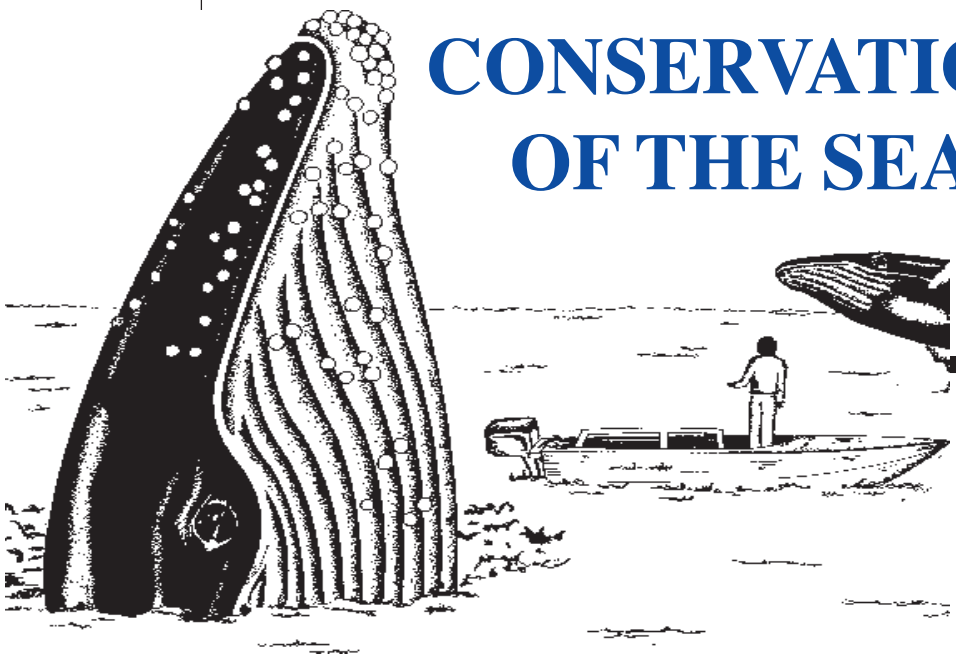
Q 195 Give two reasons why barramundi are expensive to grow.

Q 196 How are oxygen levels in the marine environment affected by temperature and salinity?

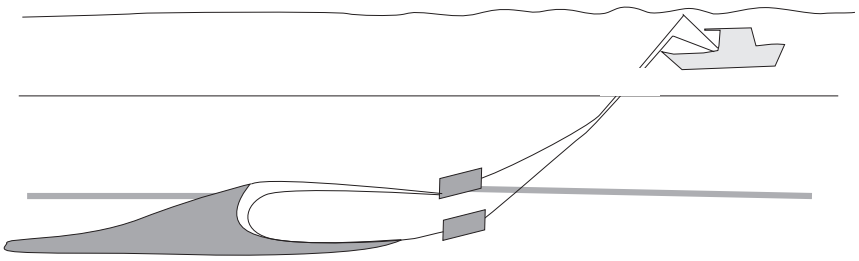
Topic 5

Exam questions

MANAGEMENT, COMMERCIAL USE AND CONSERVATION OF THE SEA



The diagram below refers to the next question



Q 1 The diagram is an example of:-
(a) Beach seine.
(b) Purse seine.
(c) Otter trawl.
(d) Drift net.

Q 2 Which of the following bodies is responsible for the zoning of the Great Barrier Reef?
(a) Department of Primary Industries.
(b) Department of Transport.
(c) Great Barrier Reef Marine Park Authority.
(d) Queensland National Parks Service.

Q 3 What activities are **not** allowed in "General Use A" zones of the Great Barrier Reef Marine Park?
(a) Trawling and line fishing.
(b) Boating and snorkelling.
(c) Commercial spear fishing.
(d) Non-manipulative research.

Q 4 In 1979, the Commonwealth and States completed an agreement for the settlement of offshore issues. This was the:-
(a) Seas and Submerged Lands Act.
(b) Offshore Constitutional Settlement Act.
(c) Coastal Waters Act.
(d) Beach Protection Act.

Q 5 In terms of value, the most important fishery in our state is:-
(a) Prawn.
(b) Barramundi.
(c) Scallop.
(d) None of the above.

Q 6 The legal size of bream is:-
(a) 23 cm.
(b) 25 cm.
(c) 23.5 cm.
(d) 30 cm.

Q 7 The legal size for diver whiting is:-
(a) 23 cm.
(b) 20 cm.
(c) None.
(d) 25 cm.

Q 8 When crabs are measured to determine their size, they are measured:-
(a) From the front to the back of the carapace.
(b) From one side of the carapace to the other.
(c) From the tip of one claw to the other.
(d) By the length of the claw.

Q 9 The legal size of mud crabs in this state is:-
(a) Measured across the carapace - 15 cm.
(b) Is taken from claw size - 6 cm.
(c) Measured 20 cm across the carapace.
(d) When maturity is reached - 20 cm across the carapace.

Q 10 A permit is required from the Fisheries Department to collect which of the following ocean species for commercial use?
(a) Aquarium fish, coral and bait worms.
(b) Beche-de-mer, trochus shell, scallops.
(c) Prawns, mudcrab, abalone, mussels.
(d) All of the above.

Q 11 The Australian Territorial water limit is:-
(a) 200 km.
(b) 320 km.
(c) 500 km.
(d) 50 km.

Q 12 Section 35 of the Fisheries Act was legislated in Queensland in 1989 to:-
(a) Prevent excessive prawning in the Gulf of Carpentaria.
(b) Prevent amateur fishermen from selling their catch.
(c) Declare closure seasons for barramundi.
(d) Prevent commercial fishing in island water.

Q 13 What is a habitat reserve?

Q 14 What happened as a result of the closure of Section 35 of the Fisheries Act?

Q 15 What is meant by multi-user zoning?

Q 16 Define the terms :-

(i) Maximum Sustainable Yield.
(ii) Recruitment.

Q 17 Who is the Marine Authority for your local harbour?

Q 18 What is the function of the Harbour Board?

Q 19 What is the Harbour Masters job? The Pier Masters job?

The following question refers to wetlands and habitat Reserves

Q 20 (a) Which has the greater protection for an area and why?
(b) Who is the governing body of each?

The following four questions refers to Fisheries Reserves.

Q 21 Explain briefly why these reserves have to be managed.

Q 22 Do all fisheries need to be managed? Why?

Q 23 List six management techniques which could be used to manage these reserves.

Q 24 Discuss two factors which can affect the value of maximum sustainable yield.

The following question refers to commercial fishing operations

Q 25 Illustrate and describe as fully as possible, the different operations involved with:-

(a) prawn striping.

(b) beam trawling.

IS IT NECESSARY TO KILL WHALES

Q 26 Read the three articles on this page, then answer the questions below

(a) What has been the main product whalers have sought?
(b) What are the main uses of that product?
(c) What has been found as an alternative to whale oil?
(d) What are the advantages and disadvantages of this alternative?
(e) For what reason do the Japanese hunt whales?
(f) Why don't Japanese eat meat?
(g) Refer to article #1. Why do the Japanese use this sea based operation of factory ships with whalers rather than shore based operations?

Article number 1: MINKE WHALING QUOTA MAY RISE

An international committee of experts has decided to recommend a near doubling of the catch quota for small minke whales in 1980, according to informed sources.

The sources, close to the International Whaling Commission, said the decision was reached at a meeting of the commission's scientific committee in England. The minke decision, which would please Japanese who consider the small whale a delicacy, could cause a major row at the IWC plenary session beginning in London tomorrow.

The commission is to hear calls from the US, Australia and the Seychelles for a variety of bans on whaling.

The 23 nation IWC will set quota for each whaling nation in the coming year, laying down which species may be hunted and where.

The sources said Australia would propose a moratorium on all whaling while the Seychelles wants a three-year ban on sperm whaling.

Article number 2: "SAVE THE WHALERS" FIGHT

Japanese whalers, faced with world pressure to cut their catches, are grimly determined to fight for their livelihood at an important meeting of the International Whaling Commission in England this month. During the early 1960s Japanese whalers caught about 20,000 whales a year in the Antarctic and the northern Pacific. Japan then had 10 huge whaling fleets, each made up of a mothers ship, 12 or 13 killer ships three refrigerator ships and a tanker.

The industry provided jobs for more than a million people including about 15,000 directly involved in whaling,

Now there is only one mother ship and it has only four catchers boats. About 200,000 people are employed in the industry, including about 1300 whalers. Whales in the past were an important source of protein for the Japanese, who until about a century ago refused to eat "four-legged" animals for religious reasons.

Since then, however, the Japanese have come to eat Western food and to move away from the sea to the pasture, although fish and other kinds of seafood, including whale, remain important parts of the national diet.

Whale meat tastes something like beef and the Japanese like it best of all raw as Sashimi, dunked in a soy and horseradish sauce. It is also cooked in soy sauce, sugar and sake rice wine and served with a raw egg as sukiyaki, or it can be roasted or broiled.

For a real delicacy, Japanese eat raw whale blubber with vinegar and soybean paste.

Early this month the country's last whaling fleet led by the 20,800-ton mother ship Daisan Nisshin Maru (Number Three New Sun) returned home. The ship had harvested whales in both the Antarctic and the northern Pacific has only 14,200 tonnes of meat and about 2600 tonnes of oil. The fleet had killed 3159 whales. The fleets, which produced only 17,400 tonnes last year, is not capable of meeting the demand of whale meat.

Last year Japan imported 30,000 tonnes from the Soviet Union, Iceland, South Korea, Brazil and other countries. Apart from eating them, they render whales into oil which is used to make cosmetics, soap and fine lubricants for delicate machinery such as rocket engines.

Article Number 3: GOOD OIL ON SAVING WHALE

The whale slaughtering industry is in jeopardy - because of a bean that looks like a bloated peanut.

For centuries whaling companies' prime has been sperm oil, a liquid wax found in the skulls of sperm whales: demand has always outstripped supply.

At present between 30,000 and 40,000 tonnes of sperm oil a year are used in automatic car transmissions, cosmetics and machines that operate at high temperatures. Now a new venture in the US has raised hopes that a cheap alternative has been found and the progressive destruction of one of the Earth's most intelligent creatures will halt.

The Americans have planted the first commercial crops of Jojoba, a weed like shrub that infests Mexico and Arizona. About half the Jojoba bean (pronounced Hohoba) is composed of an oil at least as good as, and probably better than, sperm oil as a lubricant, according to the US National Research Council.

"Jojoba is a very valuable oil" says Dr. B.B. Carrodus, a research scientist with CSIRO.

"It apparently performs every bit as well as sperm oil, and can be converted to a wax comparable to canauba, the valuable wax base for polishes.

The shrub, which grows to about 1.5 metres high, lasts about 100 years.

As well as being commercially planted by Indians in the US, Jojoba is also being researched by Israel, and crops are growing in Australia, along the Murray River and near Port Augusta, South Australia.

Two problems still face the industry. First, the plants take between five and seven years before they bear fruit. Second, a way of mechanically stripping the bean-bearing bushes remains to be developed .

TO DREDGE OR NOT TO DREDGE?

Read the three articles on this page, then answer the questions below

It is obvious that any kind of recovery of physical resources from the ocean will have some effect on the ocean environment and that recovery is bound to affect the sea water to some degree. Also it is bound to affect ocean life.

Read the two articles on this page, then answer the questions below

Q 27 With your knowledge of commercial operations of the sea and with reference to the articles on this page, list the immediate and long term effects of dredging and pumping program adopted by the Cairns Port Authority.

Q 28 What is your reaction to your uncertainty of the environmental outcome of the proposal for the widening of the channel by the Cairns Port Authority?

Article number 2
CALLS FOR SACKING OF THE PORT AUTHORITY

The Cairns and Far North Environment Centre yesterday called in the State Government to sack the Cairns Port Authority over its mishandling of the channel dredging issue.

Environment Centre co-ordinator Mr. Mark Sanders said the handling of the proposed channel widening by the Port Authority was yet another example of disregard for the natural environment and Cairns community.

"Their actions on this issue show the unaccountable nature, with even the State Environmental Minister, Mr. Pat Comben, admitting that his back was to the wall because of the way the CPA has handled the whole affair", Mr. Sanders said.

"By telling Ampol to go ahead with plan for a new ship in 1988, then trying to run the dredging proposal through the relevant authorities at the last moment, without adequate studies, it shows the CPA's contempt for both the natural environment and the general public's concerns".

"It is a direct result of the CPA's poor handling that Cairns is faced with the possibility of fuel shortages and any decision to go ahead with the dredging without conclusive studies being performed first amounts to a huge ecological experiment with likely damaging consequences for the natural environment" Mr. Sanders said.

He said this issue was really just the latest in a string of incidents which have raised the public's ire over recent years most of which have included damage to our local environment. Included in the recent past has been the airport expansion which saw the annihilation of large tracts of wetland systems in an area of high ecological significance, he said.

Article number 1
FISHING GROUP'S DUMPING CONCERN

The Cairns Port Authority proposal to widen the Cairns Harbour and dump the spoil at sea posed a threat to the area's prawn grounds, a commercial fishermen's representative said yesterday. Queensland Commercial Fishermen's Organisation (QCFO) Cairns branch chairman, Mr. Bill Izard, said dumping spoil at sea would create a "blanketing" effect on the trawling grounds.

The disturbance caused to the sea bed would mean the food the prawns ate was continually disturbed and the prawns would eventually stop returning to the area he said.

The Cairns Port Authority's proposal involves widening the channel to 90 m over an 11 km length to provide for the passage of the new Ampol tanker and boosting the annual dredging program from 300,000 tonnes to 1.8 million tonnes to maintain the new width.

"Dumping in the long term is an economic threat because common sense says if that amount of mud is dumped out there, it will have an enormous effect on the grounds these prawns are surviving on", he said.

Mr. Izard said the mud would wind up on the trawling grounds and not on the beach as had been suggested. "The beaches will not be silted up because the currents run in a northerly direction", he said.

Mr. Izard said the QCFO had approached the Marine Institute of Science in Townsville to undertake a study on the effects of dumping. "We want a study done because we don't know how bad it will be" he said. "Realistically, we should leave the channel alone but then it's a question of whether we want progress or not".

Extended answer

Imagine you are in charge of the Government Department responsible for protecting the estuarine systems in your state.

Be realistic of the fact that:-

(a) People have the right to use rivers and estuaries.
(b) Tourist development is important for the economy of our state so we need tourist facilities.
(c) That the population of the capital area will increase.
(d) The animals and plants of the rivers and estuaries are the basis of the commercial fishery.

Q 29 Write a policy statement that will outline how you would ensure that tourism, recreational and commercial fishing would have the smallest possible impact on the ecology for the local fishing grounds and yet maintain viable industries. (approx. 600 words)

Select one of the following proposed tourist developments

(a) Try to give some idea of the extent of the scheme
(b) Discuss the benefits to the community, the environment
(c) Outline what you see as problems/disadvantages with the project:

1. _____
2. _____
3. _____
4. _____
5. _____ .

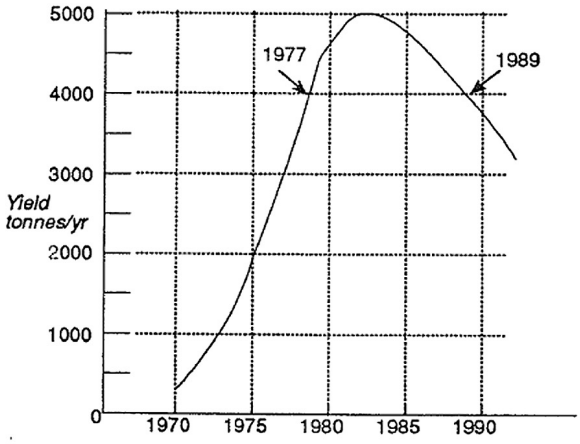
Assessment: Core/summative

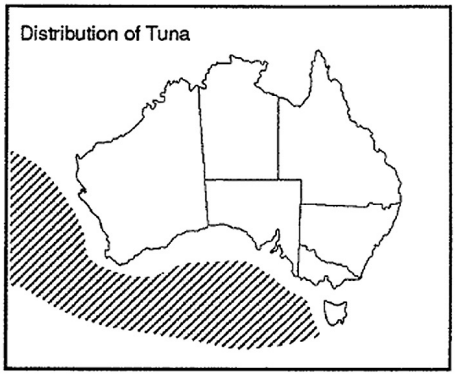
Due date:_____

Criteria	VLA	LA	SA	HA	VHA
Knowledge of relevant regulations					
Selecting and sequencing information					
Interpretation/manipulation of data					
Indication of concern/respect for marine environment					
Language					
Overall rating					

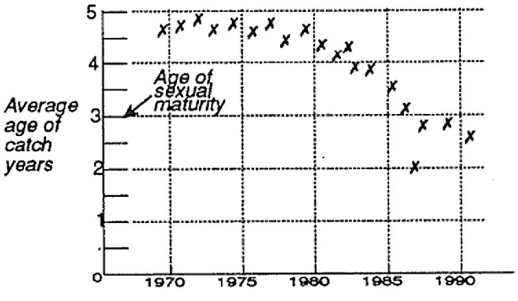
The next four questions refer to the information on the next two pages

Over the past few years much research has been undertaken into the South Australian Tuna Fishery. Some of the research findings are summarized below:





Age	Size (Averages)	
Years	Length (m)	Weight (Kg)
1	0.7	100
2	1.2	170
3	1.5	230
4	1.8	300
5	2.0	360



Tuna are a pelagic fish which live in the Indian and Southern Oceans. Each year in the breeding season, they school together and migrate down the West Australian coast and around into the sea off the Southern Australian coast as shown in the illustration above. These cold waters provide an abundant food supply in the summer months. Up to 1979 South Australian fishermen have targeted this species for the local Australian market.

Information continued over

This market supported 70 licensed fishing families and an average turnover of $20 million per year. No licence was required to operate in this fishery but a head length restriction on the net was imposed by the South Australian Government.

In 1979 the Australian Government signed a fishing agreement with Japan to allow them access to this fishery. At the time this was seen as a coup, which would earn valuable export dollars for Australia. The Japanese were interested in only the larger of the Tuna for their domestic Sashime market. Their operation consisted of a large factory ship and 30 smaller net/pole boats.

By 1985 the number of fishing families had dropped to 20. All these families were now using more expensive and sophisticated methods to maintain their catch rates. These included the use of spotter planes to find and then direct their boats to the schools, high tech. fish finding equipment, the most up to date nets and associated gear and larger boats.

Using the information supplied over and what you have learned, answer the following questions

Q 30 What changes to the stock were made by the introduction of the Japanese fishing effort? Make reference to the data supplied in the tables.

Q 31 What do you predict the long term of this fishery will be if present conditions remain the same? Explain your reasoning.

Q 32 What management strategies could be introduced to ensure the long term viability of this fishery? Specifically explain how each strategy would contribute to the overall management scheme.

Q 33 It has been suggested that the number of fish in the fishery has declined over recent years. Use the data provided to compare the numbers of fish caught in 1977 and 1989, to determine whether this suggestion can be supported or not.

Q 34 List the 6 zones used in the Great Barrier Reef Marine Park.

Q 35 List the zones in which the following activities are not permitted.
(i) Research without permit.
(ii) Tourist activities.

Q 36 List the zones in which the following activities are permitted.
(i) Commercial spearfishing.
(ii) Spearfishing with SCUBA.
(iii) Trawling.
(iv) Collecting.

Q 37 Give an example of a situation for which a "seasonal closure" would be appropriate

Q 38 Who are most responsible for day-to-day management of the reef?

Q 39 List 3 significant threats to the reef which exist at present.

Q 40 What do you understand to be the purpose of multi-user zoning?

Q 41 Suggest another region of Queensland which could be suitable for multi-user zoning (not a Barrier Reef area).

Q 42 List the user groups who would wish to be considered in your suggested area.

Q 43 Suggest the names for zones, together with those activities which would be permitted in each zone and those which would be prohibited in each zone under your zoning plan.

Draw up a table as follows:-

Name	Permitted Activities	Prohibited Activities

Q 44 This question refers to commercial fisheries.

(a) Name three commercial fisheries that are important to our local trawler fleet.
(b) Name the main fishing method for each fishery.

Q 45 What effect has the introduction of certain species had on our waterways? Give examples of introduced fish.

Q 46 Name any three effects of introduced plants on our waterways, using an example.

Q 47 Can you name any two nations who hunt whales and what is the organisation that actively protests against this whaling? Name any one strategies of protest they use.

Q 48 What is the most important commercial fishery to your local fleet?

Q 49 Approximately how much of the year is your local fishery fished?
(a) 25%.
(b) 50%.
(c) 75%.
Give reasons for your answer.

Q 50 What is the agreed maximum length for trawlers operating out of your local port?
(a) 10m.
(b) 15m.
(c) 20m.
(d) 25m.

Q 51 List five detrimental effects of canal estates in a river estuary.

Q 52 List 4 agents that pollute our waterways.

Q 53 What are three harmful effects of dredging in an estuarine area?

Q 54 Management of Fisheries involves controls over a number of different aspects of the Fishery. List 3 different areas in which fisheries management are involved.

Q 55 What organization/body is responsible for the management of fisheries in your state.

Q 56 Name 3 regulations which are designed to reduce pressure on recreational fisheries.

Q 57 Who policies all the fishing regulations?

Q 58 (a) Explain what the "freeze" policy on a fishing vessel licences is?
(b) What is it designed to do?

Q 59 What is the difference between a fisheries habitat reserve and a fish sanctuary zone?

Q 60 What is an environmental impact statement and how is it used?

Q 61 Many people believe that ocean outfalls of sewage is the answer to modern living. How is sewage treated before it enters the sea? Comment on the advantages of this method as opposed to land fill methods.

Q 62 Identify some of the ways you could reduce the amount of rubbish entering the sea.

Q 63 List those renewable resources that could be used to stop polluting the local area.

Q 64 How can plastic bags kill turtles and fish?

Q 65 Why is a study of a river important to the understanding of pollution of our seas?

Q 66 Write a short (200 word) discussion paper on any one of the following topics.

(a) Restrictions placed on barramundi fishing and the reasons for these.

(b) Methods used in rezoning of the Great Barrier Reef Marine Park.

(c) The need for commercial red claw farming.

(d) The methods used to control oil spills on the Great Barrier Reef.

(e) Long line fishing and its effects on the seas ecology.

(f) Tourist developments in your local area and the harm they cause the environment.

(g) Floating hotels and their advantages and disadvantages to tourism.

(h) Water pollution and its effects on the sea.

(i) Turtle farming in Australia.

(j) The effect of drift netting on the world's oceans.

(k) Mackerel fishing.

(l) Effects of bill fishing on local commercial operations.

(m) Sewage and its affects on the sea.

(n) How plastics effect animals in the sea.

(o) The effects of increasing nitrates in a local estuary.

(p) How a water treatment plant works and what environmental damage it can cause.

(q) The effects of sulphates in a river.

(r) Commercial fishing versus recreational fishing.

(s) Reef replenishment areas. How effective are they after the seasonal closure time expires?

(t) Camping damage on the reef.

(u) The slaughter of whales for commercial gain.

(v) The commercial fishing zone.

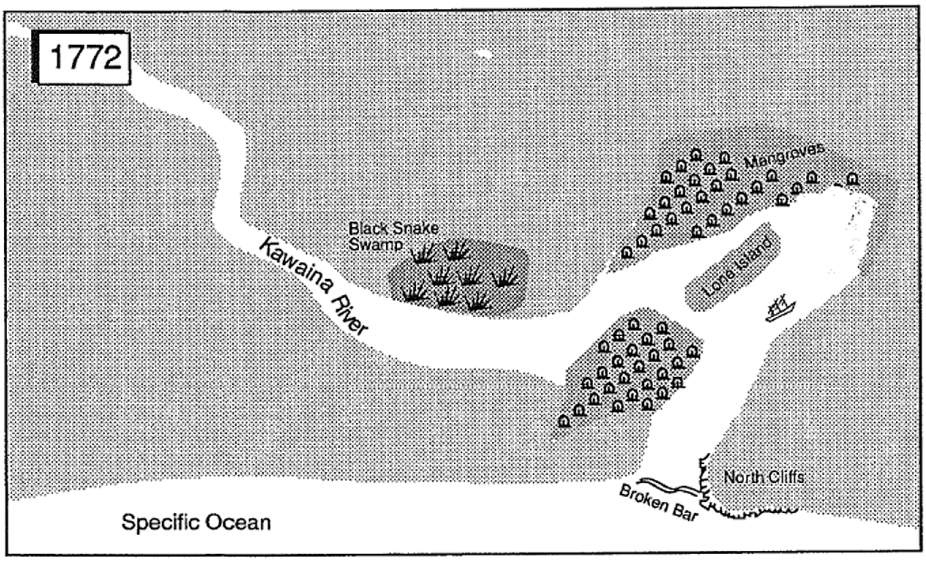
(w) Mining of the sea.

The next question refers to the following six pages

The accompanying maps, information and data relate to a hypothetical river and estuary system, in 1950 and 1990. Read the background information and study the map, data tables and graphs presented on the accompanying pages carefully before answering the following questions.

Early History

The Kawaina River was discovered by Capt. James Kruck in 1772. He described it as "a short fast flowing river, with heavy mangrove swamps near the entrance. The river entrance is passable by a shallow bar and a deep channel runs beside large cliffs to the north. Inside the estuary is a large island which I have called Lone Island. Behind this is an excellent area for the establishment of a town."



Settlement

In 1870, two escaped convicts called Charles and Alpha managed to set up a small fishing operation behind Lone Island. The operation went well until an argument over a game of cards saw the partnership split and Alpha took up sugar cane and pineapple growing, while Charles ventured into beef cattle. The towns of Alphaville and Charlestown now bear their names.

In 1950, Mr Big and his family purchased the land to the south of Lone Island and established a city to process the cattle, pineapples and sugar. Land was subdivided for an industrial estate on which the Big family built factories. The eldest son of Mr Big decided to subdivide the mangrove swamp on this land and create Paradise Canal Estate, a playground for the rich and famous.

Water quality control background information

Water samples were collected in 1950 and compared with those from 1990. Tables 1, 2 and 3 on the next page summarise the 1950 data, while Tables 4, 5 and 6 summarise the 1990 data. The purpose of each of the tests is to build up a picture of the individual and overall quality of a particular stretch of water.

Hypothetical River and Estuary Research Project (continued)

For each test, the important value is the "Q" value. This gives an indication of the acceptability of the water in terms of its pollution level from a variety of sources.

The closer a "Q" value is to 100, the better the water is in terms of the particular feature being monitored.

The "multiplying factors" then assign a relative importance to each of the factors in terms of their overall effect on the quality of the water. The Water Quality Index is an overall measure of the quality of the water, taking into account the contributions of each of the individual tests. Again, the closer the value is to 100, the "better" the water is.

*Some values may be low because of the nature of the catchment area. e.g. turbidity may be high due to tannin in the water from an area of Tea Trees. This would not necessarily detract from the quality of the water.

Each test measures:-

(a) **Dissolved Oxygen:**- The amount of oxygen available in the water. A low reading indicates an inability of the water to support animal life in any quantity. It may be due to high temperatures, stagnation or chemical pollution.

(b) **Faecal Coliform**s:- Measures the frequency of E. Coli in the water, a bacteria present in the faeces of mammals. May be due to rural (e.g. cattle) or human wastes.

(c) **pH**:- The acidity or alkalinity of the water. May be due to the geology of the surrounding terrain. An abnormal value may indicate the presence of chemical pollutants.

(d) **B.O.D**.:- Biological/Chemical Oxygen Demand. Indicates the level of bacteria in the water... to be compared with the level of D.O.

(e) **Temperature**:- A change in the temperature between sampling sites may indicate the outpouring of wastes in the area.

(f) **Phosphates**:- Measures the amounts of phosphates. May be due to the run-off of fertilizers or detergents into the water.

(g) **Nitrates**:- Due largely to run-off of fertilizers.

(h) **Turbidity**:- A measure of the cloudiness of the water. An often unreliable test due to silt from recent rains, tannin, etc. However, abnormal readings may indicate eutrophication or erosion.

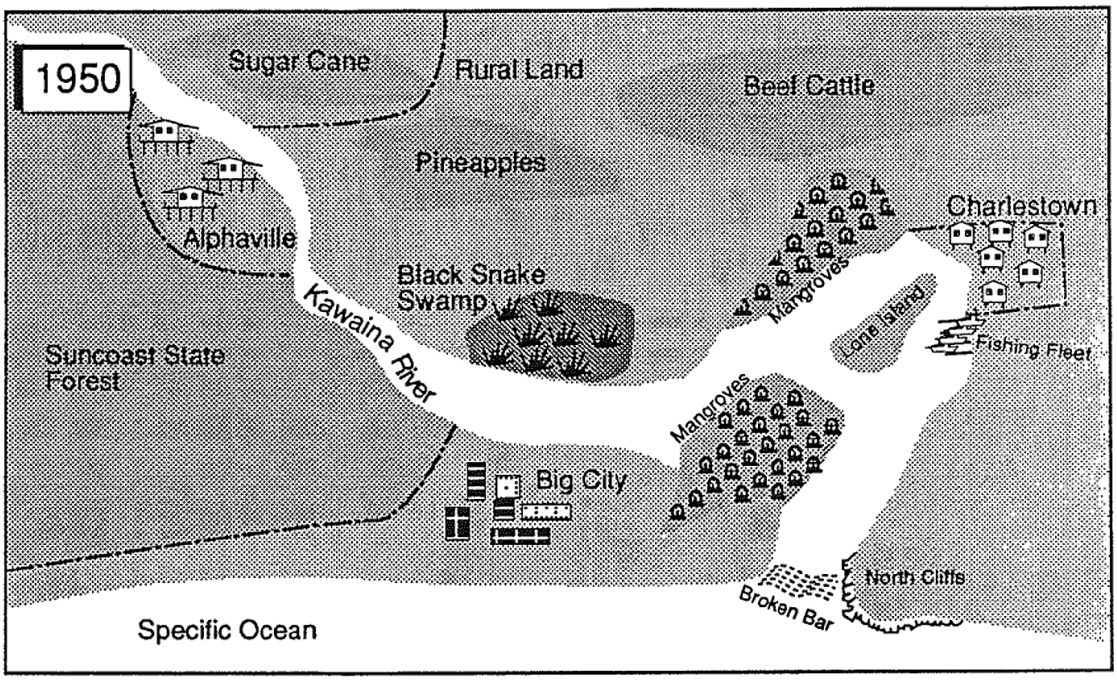
(i) **Dissolved Solids**:- Measures the amount of dissolved solids in the sample. Sometimes unreliable due to brackish/salty water in intertidal estuaries. An otherwise high reading may indicate salts etc. in the catchment area.

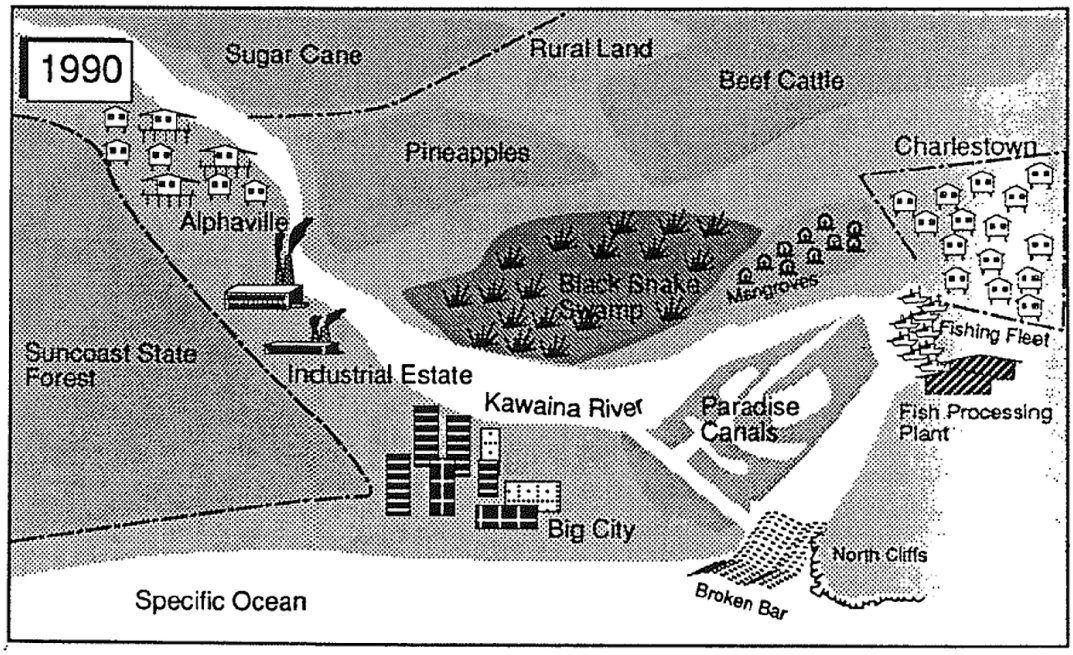
For each test :-

(a) The river data is recorded in Column A
(b) The Q Value (from the charts) is recorded in Column B
(c) The values in Column B are multiplied by the weighting factor in Column C and record the results in Column D
(d) The values in Column D are added to get the Overall Water Quality.

Settlement patterns 1950 and 1990

Hypothetical River and Estuary Research Project (continued)





Hypothetical River and Estuary Research Project (continued)

Table 1 Water Quality Data

Alphaville

19/5/50

(The Overall Water Quality of a Section of a River System. Water Quality Index WQI)

CODE	TEST	Result (A)	Units	Q-Value (B)	Weighting (C)	TOTAL (D)
D.O.	1. Dissolved Oxygen	108.00	% Sat	98.00	0.17	16.66
COLI.	2. Faecal Coliform	2.00	colon/100ml	89.00	0.16	14.24
pH	3. pH	7.20	units	91.00	0.11	10.01
B.O.D.	4. B.O.D.	3.00	mg/l	68.00	0.11	7.48
TEMP.	5. Temperature	1.5	^{0}C	91.00	0.10	9.10
PHOS.	6. Total Phosphorus	0.10	mg/l	99.00	0.10	9.90
NIT.	7. Nitrates	0.10	mg/l	99.00	0.10	9.90
TURB.	8. Turbidity	1.8	/meter	90.00	0.08	7.20
SOLIDS	9. Total Solids	75.00	mg/l	86.00	0.07	6.02
Overall Water Quality Index		---------->				**90.51**

Table 2 Water Quality Data

Big City

19/5/50

(The Overall Water Quality of a Section of a River System. Water Quality Index WQI)

CODE	TEST	Result (A)	Units	Q-Value (B)	Weighting (C)	TOTAL (D)
D.O.	1. Dissolved Oxygen	100.00	% Sat	99.00	0.17	16.83
COLI.	2. Faecal Coliform	2.00	colon/100ml	89.00	0.16	14.24
pH	3. pH	7.40	units	92.00	0.11	10.02
B.O.D.	4. B.O.D.	3.00	mg/l	68.00	0.11	7.48
TEMP.	5. Temperature	1.5	^{0}C	91.00	0.10	9.10
PHOS.	6. Total Phosphorus	0.10	mg/l	99.00	0.10	9.90
NIT.	7. Nitrates	0.10	mg/l	99.00	0.10	9.90
TURB.	8. Turbidity	1.80	/meter	90.00	0.08	7.20
SOLIDS	9. Total Solids	75.00	mg/l	86.00	0.07	6.02
Overall Water Quality Index		---------->				**90.79**

Table 3 Water Quality Data

Charlestown

19/5/50

(The Overall Water Quality of a Section of a River System. Water Quality Index WQI)

CODE	TEST	Result (A)	Units	Q-Value (B)	Weighting (C)	TOTAL (D)
D.O.	1. Dissolved Oxygen	94.00	% Sat	96.00	0.17	16.32
COLI.	2. Faecal Coliform	13.00	colon/100ml	68.00	0.16	10.88
pH	3. pH	7.60	units	91.00	0.11	10.01
B.O.D.	4. B.O.D.	4.00	mg/l	61.00	0.11	6.71
TEMP.	5. Temperature	2.0	^{0}C	89.00	0.10	8.90
PHOS.	6. Total Phosphorus	0.40	mg/l	60.00	0.10	6.00
NIT.	7. Nitrates	0.50	mg/l	70.00	0.10	7.00
TURB.	8. Turbidity	1.30	/meter	53.00	0.08	4.24
SOLIDS	9. Total Solids	110.00	mg/l	84.00	0.07	5.88
Overall Water Quality Index		---------->				**75.94**

Table 4 Water Quality Data

Alphaville

28/4/90

(The Overall Water Quality of a Section of a River System. Water Quality Index WQI)

CODE	TEST	Result (A)	Units	Q-Value (B)	Weighting (C)	TOTAL (D)
D.O.	1. Dissolved Oxygen	80.00	% Sat	88.00	0.17	14.96
COLI.	2. Faecal Coliform	18.00	colon/100ml	63.00	0.16	10.08
pH	3. pH	8.00	units	85.00	0.11	9.35
B.O.D.	4. B.O.D.	6.00	mg/l	53.00	0.11	5.83
TEMP.	5. Temperature	1.5	^{0}C	91.00	0.10	9.10
PHOS.	6. Total Phosphorus	1.00	mg/l	40.00	0.10	4.00
NIT.	7. Nitrates	2.40	mg/l	90.00	0.10	9.00
TURB.	8. Turbidity	1.80	/meter	90.00	0.08	7.20
SOLIDS	9. Total Solids	140.00	mg/l	80.00	0.07	5.60
Overall Water Quality Index		---------->				**75.12**

Table 5 Water Quality Data

Big City

28/4/90

(The Overall Water Quality of a Section of a River System. Water Quality Index WQI)

CODE	TEST	Result (A)	Units	Q-Value (B)	Weighting (C)	TOTAL (D)
D.O.	1. Dissolved Oxygen	70.00	% Sat	77.00	0.17	13.09
COLI.	2. Faecal Coliform	25.00	colon/100ml	61.00	0.16	9.76
pH	3. pH	8.00	units	85.00	0.11	9.35
B.O.D.	4. B.O.D.	8.00	mg/l	37.00	0.11	4.07
TEMP.	5. Temperature	2.0	^{0}C	90.00	0.10	9.00
PHOS.	6. Total Phosphorus	1.40	mg/l	35.00	0.10	3.50
NIT.	7. Nitrates	15.00	mg/l	43.00	0.10	4.30
TURB.	8. Turbidity	1.30	/meter	53.00	0.08	4.24
SOLIDS	9. Total Solids	210.00	mg/l	72.00	0.07	5.04
Overall Water Quality Index		---------->				**62.35**

Table 6 Water Quality Data

Charlestown

28/4/90

(The Overall Water Quality of a Section of a River System. Water Quality Index WQI)

CODE	TEST	Result (A)	Units	Q-Value (B)	Weighting (C)	TOTAL (D)
D.O.	1. Dissolved Oxygen	60.00	% Sat	58.00	0.17	9.86
COLI.	2. Faecal Coliform	250.00	colon/100ml	31.00	0.16	4.96
pH	3. pH	8.60	units	70.00	0.11	7.70
B.O.D.	4. B.O.D.	13.00	mg/l	24.00	0.11	2.64
TEMP.	5. Temperature	5.0	^{0}C	73.00	0.10	7.30
PHOS.	6. Total Phosphorus	1.80	mg/l	30.00	0.10	3.00
NIT.	7. Nitrates	23.00	mg/l	34.00	0.10	3.40
TURB.	8. Turbidity	0.87	/meter	32.00	0.08	2.56
SOLIDS	9. Total Solids	340.00	mg/l	54.00	0.07	3.78
Overall Water Quality Index		---------->				**45.20**

Hypothetical River and Estuary Research Project (continued)

Comparison of Mullet and Prawn catches from the fishing fleet

Figure 1

Mullet catches in tonnes for the years 1966 - 1991

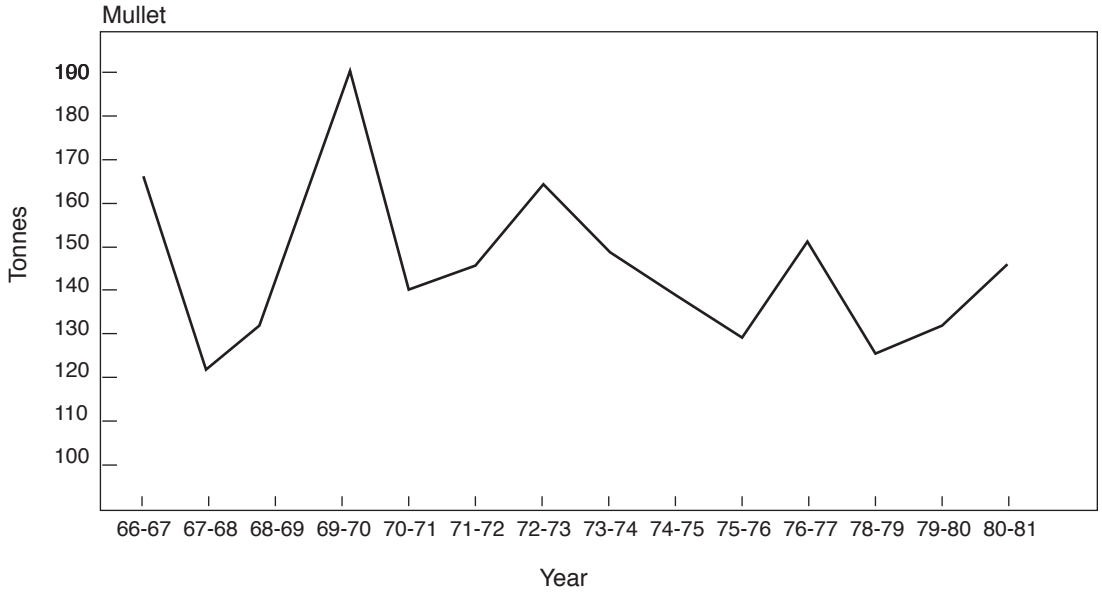
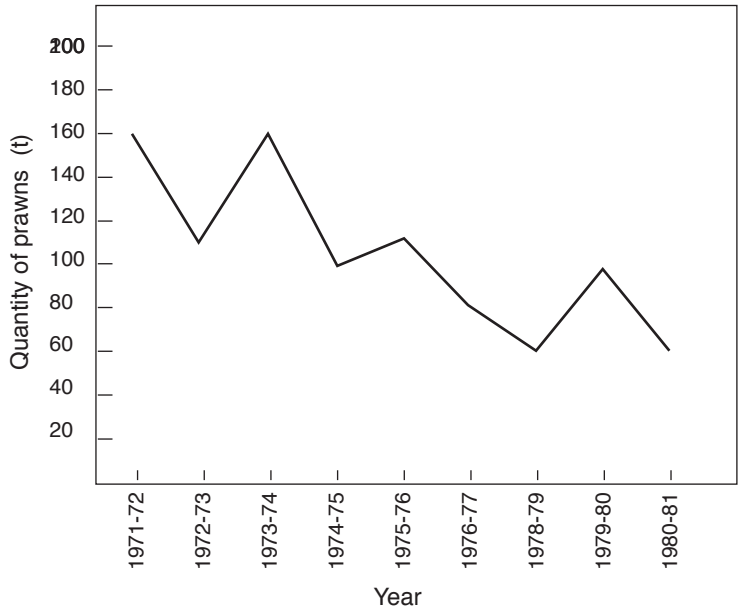


Figure 2

Quantity of prawns caught for the years 1971 - 1982



Questions

Q67 (a) Compare the overall condition of the river water in 1950 to that of 1991.

(b) Which "Q" values have undergone **significant** changes over the years?

(c) Suggest possible reasons for changes in each of the values from (b) above.

(d) Which part(s) of the river has been most affected? Why?

Q69 The canal estate development was commenced in 1968 and now has a population of 15,000 people. **No environmental impact studies were carried out prior to or during construction.**

(a) Outline the **physical** (not chemical) effects the development has had on the river/estuary system.

(b) What data supports your conclusions?

(c) In what way might the development affect the biological stability of the system?

Q70 The attached graphs show that although the fishing fleet has increased by 50%, the size of the catch has decreased. How would you account for this?

Q71 You have been appointed the chairperson of a Government committee, set up to address the problems associated with the river/estuary system.

Remembering that the river is a multi-user situation that must be maintained, what recommendations would you make in your report to the Government?

Q72 Given the changing emphasis on various management techniques which relate to both commercial and recreational fishing:-

(a) Give reasons why a legal maximum size might be introduced for some species.

(b) Name the species.

(c) Outline the problems which could arise out of such a change in the regulations.

Q 73 The Australian Territorial water limit is:-
(a) 200 km.
(b) 320 km.
(c) 500 km.
(d) 50 km.

Q 74 Name 3 minerals which are currently mined from the ocean sea bed.

Q75 The percentage of the world's food that comes from the sea is?
(a) 2 - 4 %.
(b) 10 - 20 %.
(c) 0.1 - 1 %.
(d) 40 %.

Q 76 The area of the ocean that provides most of the food is:-
(a) Coastal ocean.
(b) The continental shelf.
(c) Seabeds.
(d) Estuary.

Q 77 Who is the Marine Authority for your local Harbour?

Q 78 What is the function of the following personnel?
(a) Harbour Master.
(b) Pier Master.

Q 79 Name 3 major shipping operators for your local port.

Q 80 Of the following which is not a function of your local Authority?
(a) Navigation and Pilotage Service
(b) Operation of Seaport
(c) Operation of Airport
(d) Pursuing proposals for the establishment of export processing industries.

Q 81 Name 3 major port facilities provided by the Port Authorities.

Q 82 Briefly describe the following terms as applied to your local harbour:-
(a) 'Pilotage'.
(b) 'Towage'.
(c) 'Stevedoring'.
(d) 'Drydock'.

Q 83 Briefly outline the function of three wharves at your local port:-
(a) Wharf 1.
(b) Wharf 2.
(c) Wharf 3.

Q 84 Name 2 major companies with construction and repair facilities which service your local port.

Many Australian economists believe Australia's shipping line is inefficient. They list high operating costs, poor marketing and poor industrial relations as just some of the problems. Australian vessels carry less than 5% of Australia's external trade. It has been estimated that Australia spends $740 million annually in shipping costs.

Q 85 Do you agree with the above statement ? Why? If you do agree can you describe any measures that may make Australian shipping more economically viable?

Q 86 In terms of value, the most important fishery in our state is:-
(a) Prawn.
(b) Barramundi.
(c) Scallop.
(d) Tailor.

Q 87 A permit is required from the Fisheries Act to collect which of the following ocean species for commercial use.
(a) Aquarium fish, coral , bait worms.
(b) Beche-de-mer, trochus shell , scallops
(c) Prawns, mudcrab, abalone, mussels
(d) All of the above

Q 88 Which of the following Commercial Fishing methods is legal to the recreational fisherman?
(a) Gill (set) net
(b) Purse seining
(c) Drop line
(d) Bottom long line

Q 89 Section 35 of the Fisheries Act was legislated last year to:-
(a) Prevent excessive prawning in the Gulf of Carpentaria.
(b) Prevent amateur fishermen from selling their catch.
(c) Declare closure seasons for barramundi.
(d) Prevent commercial fishing in island water.

Q 90 Given the changing emphasis on various management techniques which relate to both commercial and recreational fishermen:-

(a) Give reasons why a legal maximum size might be introduced for some species.
(b) Name the species.
(c) Outline problems which could arise out of such a change in the regulations.

Q91 Illustrate and describe as fully as possible, the different commercial fishing operations listed below:-
(a) Beach seine.
(b) Beam trawling.
(c) Pole fishing.

Q 92 With the aid of a diagram explain how a commercial trawler trawls for prawns (make reference to otter boards, tickler chains and lazy line).

Q 93 Evaluate and discuss what management measures could be taken to prevent over-exploitation of our state's prawn fisheries.

Q 94 Recent changes to Section 35 of the Fisheries Industry Organisation and Marketing prohibits the sales of fish by amateur fishermen.
(a) List arguments that may be listed both for and against this restriction.
(b) Do you agree with this restriction? Why ? Support your argument with clear explanations.

Q 95 Imagine you are an officer in the GBRMPA with the job of developing guidelines for managing fishing on the reef.
(a) What would be the 3 most important issues you would have to investigate first?
(b) How would you find information to answer your questions?
(c) What rules do you think should guide commercial fishing on the reef?
(d) What information would you need to make rules controlling recreational fishing on the reef?
(e) What are the advantages and disadvantages of encouraging aquaculture?

Q 96 What food group in the diet is contributed by marine products?
(a) Carbohydrates.
(b) Sugars.
(c) Fibre.
(d) Protein.

Q 97 List four uses of Algae (seaweed).

Q 98 Briefly describe the difference between a "grow out facility" and "a hatchery".

Q 99 What are four factors which are important when selecting an aquaculture species?
State why each is important.

Q 100 What is meant by the term 'morphometric relationship'.

Q 101 An hermaphrodite is an animal which:-
(a) Produces many young.
(b) Is capable of being either sex.
(c) Is only ever female.
(d) Reproduces asexually.

Q 102 The term "brood stock" refers to:-
(a) Organisms used for breeding purposes.
(b) The most mature individuals in a stock.
(c) Those that carry and protect their young.
(d) Those close to breeding condition.

Q 103 What are the 4 basic methods of fish-farming to date?

Q 104 Barramundi fish are Catadromous. This means that:-
(a) The fish breed in salt-water and migrate up rivers to feed.
(b) Grow in salt-water and breed in fresh.
(c) The fish are endemic.
(d) The fish are not prone to hybridization.

Q 105 What are 2 problems associated with oyster farming?

Q 106 Briefly explain "suspension cultures" developed by the Japanese to enable 'spats' to grow.

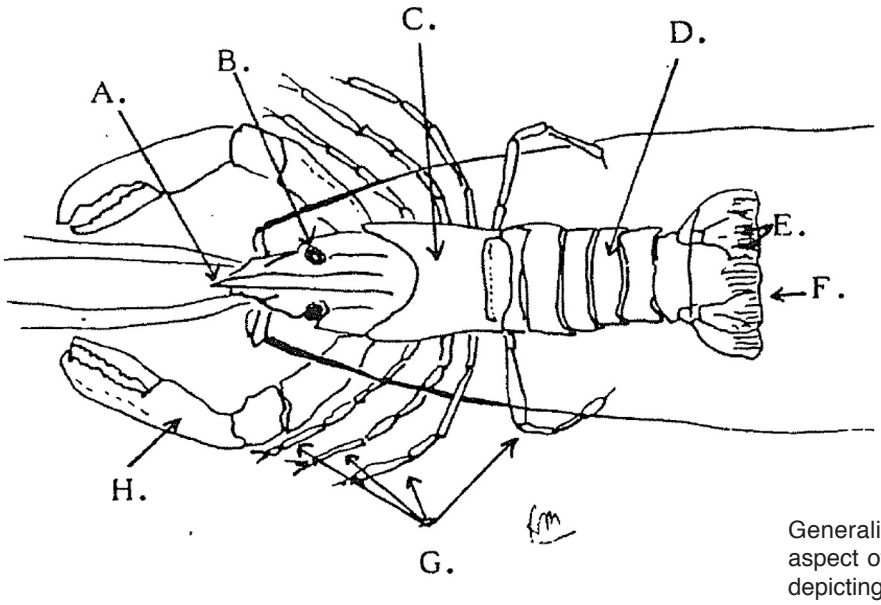
Q 107 What are the advantages of this method?

Q 108 A spat is a young:-
(a) Oyster.
(b) Fish.
(c) Crab.
(d) Prawn.

Q 109 Explain why ecdysis is an important event in the aquaculture of fresh water crayfish and the role of the gastroliths in this process.

Q 110 Which of the following Freshwater Cray fish species is native to Northern Australia.
(a) *Cherax termimanus*.
(b) *Cherax destructor*.
(c) *Cherax quadricarinatus*.
(d) *Cherax macobrachium*.

Q 111 Name the structures indicted in the diagram.



Generalised illustration of dorsal aspect of *Cherax quadricarinatus,* depicting anatomical features.

The next four questions refer to the graphs below

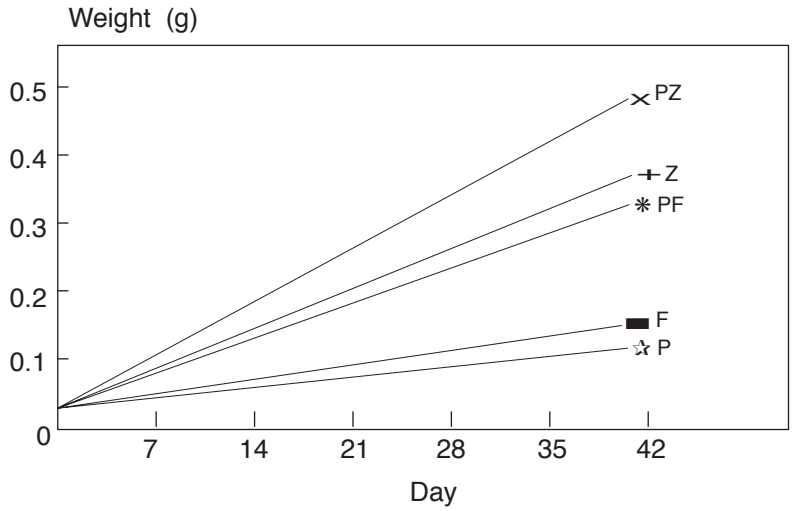


Figure A: Mean growth *Cherax quadricarinatus* after 39 days using 5 combinations of food and habitat. PZ - Zooplankton food, *Pistia* present, Z - Zooplankton food only, PF - Flake food, *Pistia* present, F - flake food only, P - no food, *Pistia* present.

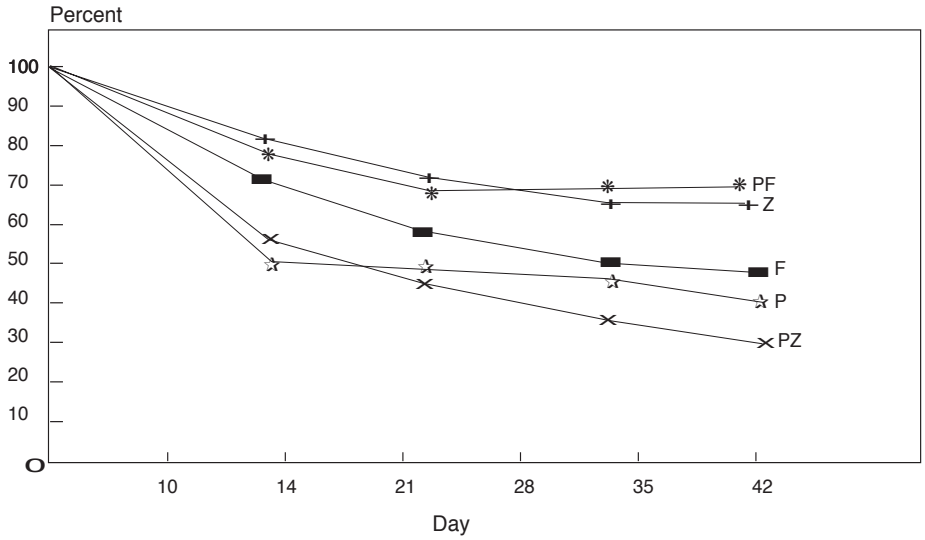


Figure B: Mean survival of juvenile *Cherax quadricarinatus* over 39 days using 5 combinations of food and habitat. PF - flake food, Pistia present, Z - Zooplankton food only, F - Flake food only, P - No food, Pistia present, PZ - Zooplankton food, Pistia present.

Q 112 Choose the food source that you would use to raise *Cherax quadricarinatus*, giving the reasons for your choice.

Q 113 Technology has enabled us to induce spawning of invertebrates. From the species studied, select 2 and describe how your understanding of these "induced spawning" methods may be used in relation to the culture of the species chosen.

Q 114 Briefly outline the life cycle of *Cheras quadricarinatus*.

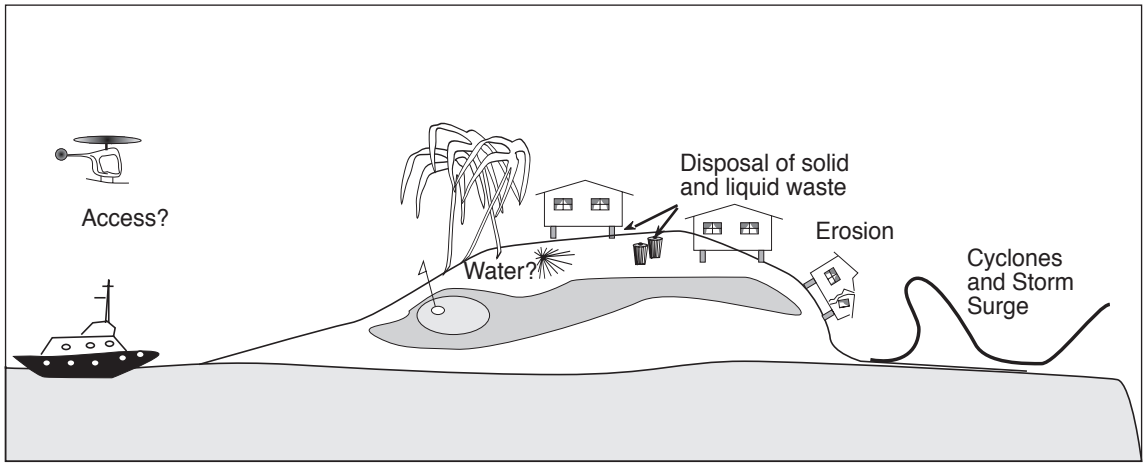
Q 115 Hatchings of *Cherax quadricarinatus* weigh:-
(a) 2.0g.
(b) 0.002g.
(c) 0..02g.
(d) 0.2g.

Q 116 Name 3 characteristics of mudcrabs which do not lend themselves to farming.

Q 117 You are an aquaculture consultant, and you have advised a local farmer to construct a number of smaller ponds instead of one large single pond. Outline three reasons why you would give this advice.

Q 118 Why have management problems caused by tourism facilities on coral cays been so severe that permission for further cay developments is unlikely?

Q 119 Pictured below is a coral cay which is to be developed as a tourist destination. How would you solve the problems listed whilst still preserving the environment and natural beauty of the island?



After James Cook Uni and AIMS staff

Q 120 What solutions are there for these problems?

Q 121 Some of the invertebrates are very suited to mariculture. Farms are now being given more emphasis as they are more energy efficient and have greater productivity. Suggest 2 reasons for this development.

Q 122 Outline 3 reasons (explain each in detail) why aquaculture is becoming more and more a viable solution to the decrease in the number of fish in Australia's freshwater environment.

Q 123 Outline the reasons why aquaculture will become more important in the future.

Q 124 Outline the steps taken to culture pearls.

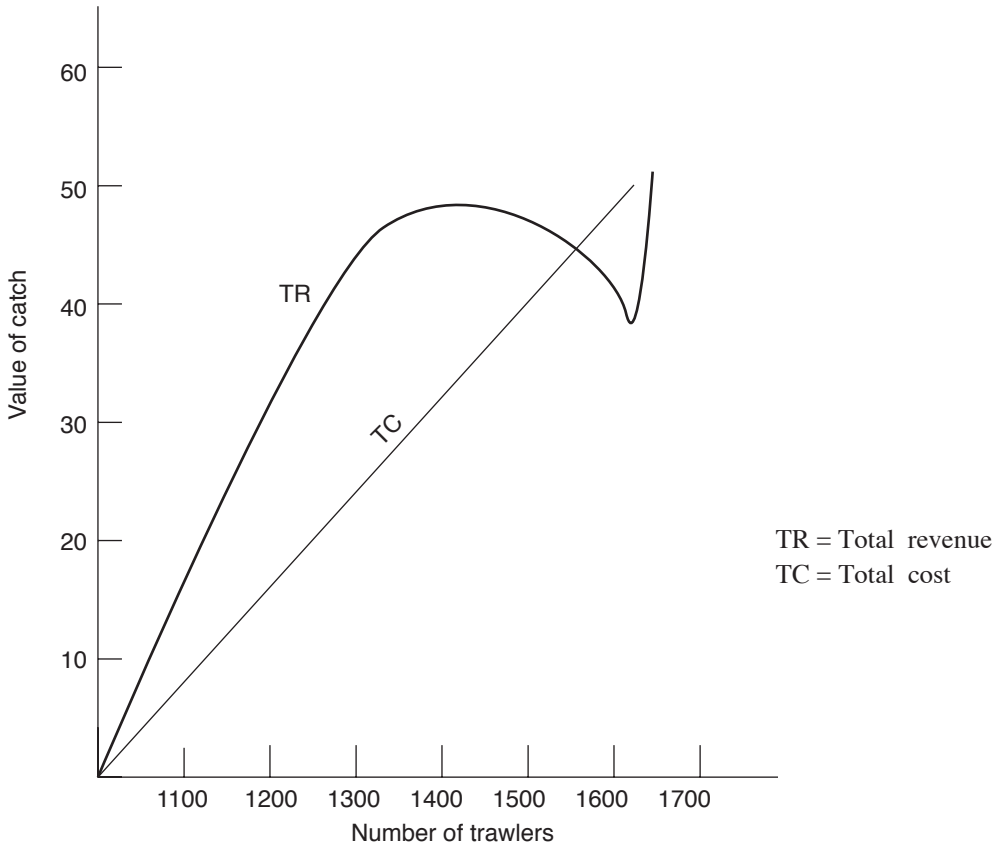
Q 125 Can plankton be farmed? If so, of what nutritional value is it?

Q 126 Describe how to peel a prawn.

Q 127 How are oysters prepared for market?

Q 128 What should you look for when buying prawns for your seafood restaurant?

The following question refers to the graph below



Q 129 Maximum sustainable yield (MSY) is the maximum number of fish that can be caught without affecting stock. That is at MSY losses from natural death and catches equals gains resulting from growth and birth.

(a) Mark on the graph the point of maximum sustainable yield (MSY).

(b) How may trawlers were operating at the time?

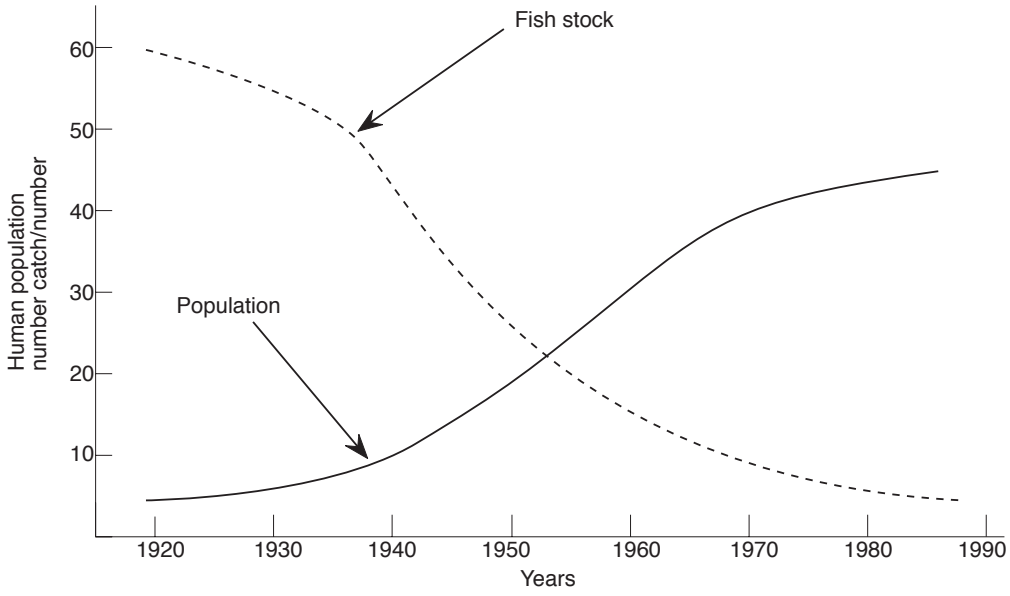
(c) What is the total value of the catch at MSY?

(d) At what point (approx.) did over exploration of the state prawn fishery occur (answer in number of trawlers)? Can you give a reason for this exploitation?

The next question refers to the information below

In 1920 a tropical island is inhabited by a group of 20 people. At this stage the fish population is abundant and there are more than enough fish to supply the community with food and the recreational and commercial fisherman with profit. Over the next 70 years, the population increases dramatically and fishing on both a recreational and commercial scale also increases dramatically, until there is a noticable decline in both the quantity of the fish caught and their average size.

Population trends and fish stock have been graphed below.



The community relies totally on the fish catch for food and economic revenue. This revenue is used to buy in other products needed by the community.

The commercial fishermen depend solely on the fish stock for their living. Recreational fishermen depend on the fish to supplement their food supply.

The community's survival depends on a continuous supply of fish as well as a source of income.

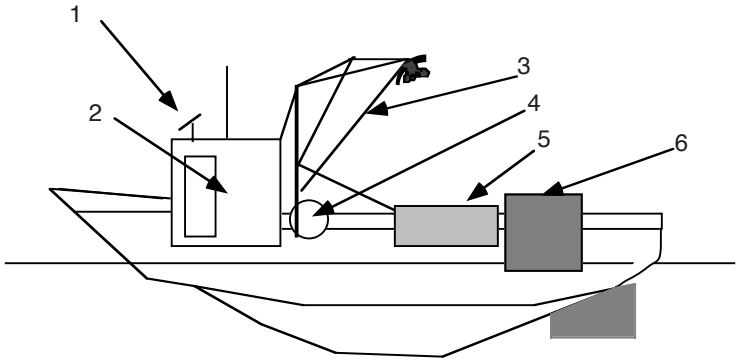
Q 130 You are the chairman of a committee set up to solve the communities crisis.

(a) Can you develop a management plan that will satisfy the fisherman , the community and the fish? (Your management plan should contain objectives, options and ways of implementing these options).

(b) What restrictions will you have to impose and why?

(c) What effects will these restrictions have on the community fishermen and fish?

The next three questions refer to the diagram of the trawler below



Q 131 What is the function of the otter boards and from what materials are they constructed?

Q 132 Identify the parts labelled 1 - 6 and state the function for each.

Q 133 Describe what happens to a catch of prawns when they are on board a trawler.

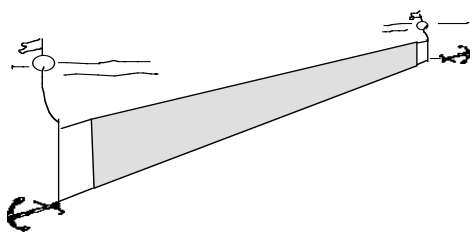
Q 134 Why do tiger prawns moult?

Q 135 Describe the life cycle of the tiger prawn, making sure you classify each stage into either planktonic, nektonic or benthic.

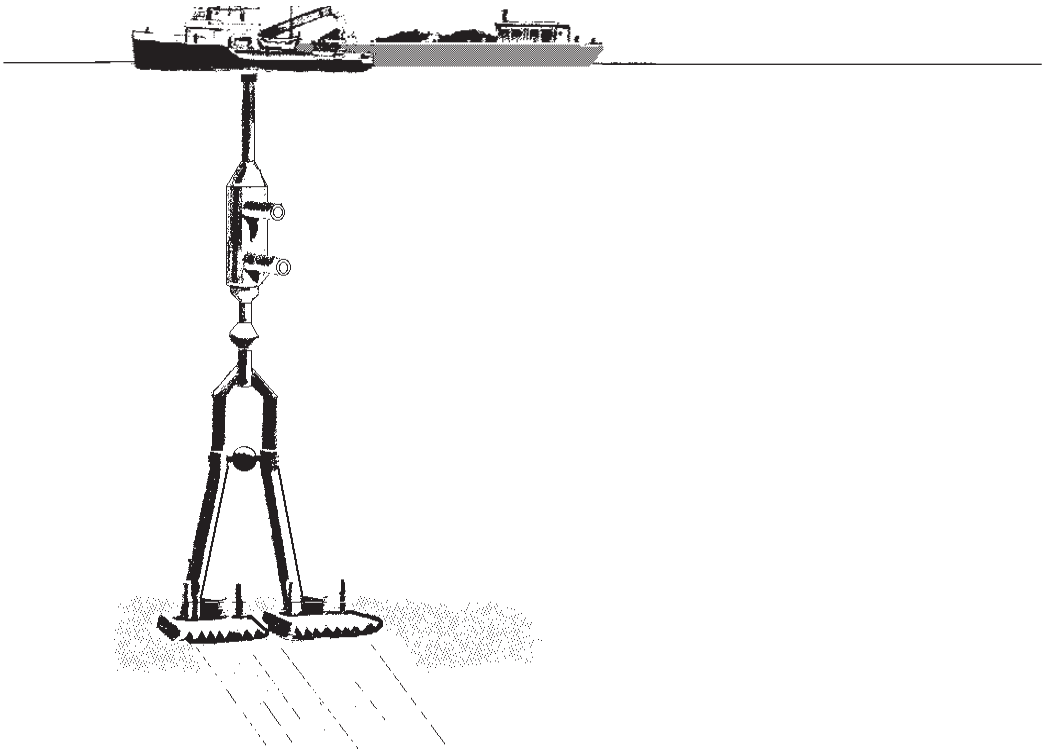
Q 136 Describe how you would prepare and cook a fish for a meal to a particular recipe. In doing so, make sure you identify the recipe and then describe the processes involved in:-
(a) Gutting and chilling.
(b) Filleting.
(c) Cooking .
(d) Presenting it to the table.

Q 137 On your excursion to the trawler base describe the steps involved in:-
(a) Selling the catch.
(b) Preparing the catch for sale.
(c) Marketing the catch .
(d) What is the difference between retailing and wholesaling?

Q 138 The net shown to the right is:-
(a) A gill set net.
(b) A long line net.
(c) A purse net.
(d) A drop line net.



The next six questions refer to the illustration below



Q 139 What minerals could be mined using this method?

Q 140 Describe how the vessel would work to remove minerals from the sea bed.

Q 141 What limitations would be placed on this method and why?

Q 142 What environmental problems would be created and how much damage to the sea bed would occur?

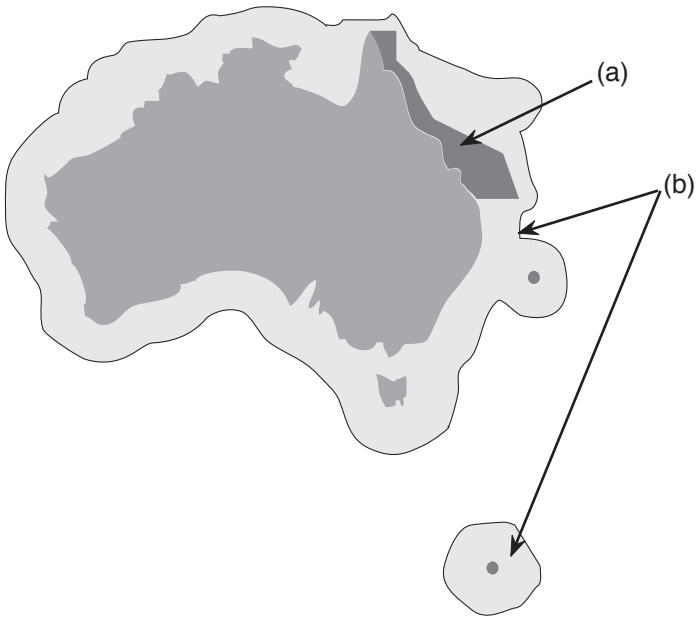
Q 143 If you were an Environmental Protection Agency and this method was in operation, what limitations would you place on its operation.

Q 144 A cure for AIDS has been found in a rare chemical found on the Great Barrier Reef in dead corals eaten by Crown of thorns starfish. It seems that the starfish causes a chemical reaction, inducing the AIDS fighting chemical to form.

Would you allow mining of the coral in the national park?

List the reasons for and against its distribution.

The next five questions refer to the map of Australia below



Q 145 What is the zone marked (b) and why is it important to all Australians?

Q 146 What is the area shaded (a) and of what significance is it to Australia?

Q 147 If you were to defend Australia from an invasion from the north, what defences would you put in place and why?

Q 148 What advantages would there be to allowing fishing boats from other nations to fish our waters? Give reasons for your answer.

Q 149 Make a rough sketch on the map below where whales migrate to and from during summer and winter months.

Q 150 Extended answer question

Background information

Students visited two local aquaculture operations. They toured the plants and were given talks by qualified marine biologists. They were also given the opportunity to formulate and ask questions of the various aquaculture staff. Using this information students were required to write an in class essay. Students were allowed to use any notes they took whilst visiting the aquaculture farm.

Assessment criteria

* Essay is to be between 500 and 1500 words in length (strive for quality rather than quantity).
* Students may use notes taken during the visit to the aquaculture farm.
* Students are to write their report in an essay format not note form.

STUDENT NAME: _____ FORM GROUP:

TEACHERS NAME: _____ MARK:

ESSAY TITLE:

INTRODUCTION:	Student	Teacher
A paragraph introducing the topic and giving the reader an overview of the essay format.	( )	( )
MAIN BODY:		
1. (1-2 Paragraphs) General overview of the aquaculture operation	( )	( )
2. (2-3 paragraphs) Problems with the operation	( )	( )
3. (2-3 Paragraphs) Benefits from the aquaculture operation	( )	( )
4. (2-3 Paragraphs) Future of the operation	( )	( )
5. (2-3 Paragraphs) Any positive or negative effects on the environment or the economy.	( )	( )
CONCLUSION: A paragraph summarizing conclusions reached in the essay.	( )	( )
OVERALL RATING:	( )	( )
Comment:		

The term paper

Name of School _____

Year _____ **Semester** _____

Date Set _____ **Teacher's Name** _____

Draft Due _____ **Parent's Signature** _____

Due Date _____

Students Name _____ **Marks** _____

Class time allocated _____ **Weighting** **Summative** _____%
Formative _____%

The purpose of this assignment is for the student to research a selected topic and write 1500 - 2000 word paper. Topics may be selected from the following areas or any other topic relevant to human influences on the marine environment. Students are required to research the topic themselves though the teacher will provide relevant information and contacts where applicable.

Marine Studies Topics

1. Restrictions on barramundi fishing
2. Rezoning of the Great Barrier Reef Marine Park
3. Tourism on Green Island
4. Commercial red claw farming. Is there really a need?
5. Oil spills on the Great Barrier Reef
6. Long line fishing
7. Coquette Point Tourist Development
8. Trinity Point Project
9. The Floating Hotel
10. Water Pollution on the local environment.
11. Lobster catches in _____ (Torres Strait)
12. Restrictions on crab catches
13. Future tourism in _____(Innisfail)
14. Drift netting
15. Port Douglas, the effects of the tourist boom
16. Oil spills in _____ (Innisfail sugar mills)
17. Mackerel Fishing
18. Effects of bill fishing and accidental commercial fishing on the black marlin

Marine Studies Papers

Papers should contain the following information:-

(a) Title page
- Listing topic, date, student's and teacher's names

(b) Introduction
- A paragraph introducing the topic and giving the reader an overview

(c) Main body
- Should contain a description of the subject matter
- Student's description of how data was collected
- Arguments supporting both sides/view of the project
- data supporting the above arguments

(d) Conclusion
- a paragraph summarizing the conclusions reached in the paper

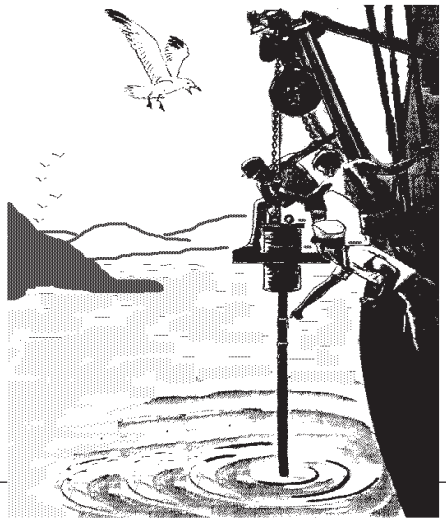
(e) Relevant papers/reports used

(f) Bibliography.

Topic 6

Sample Exam Questions

COASTAL STUDIES AND OCEANOGRAPHY



Complete the sentences in each of the next six questions

Q 1 The movement of sand off a dune to an offshore bar during a storm is called _____ .

Q 2 The distance of ocean over which a wind blows to cause a wave is called the _____ .

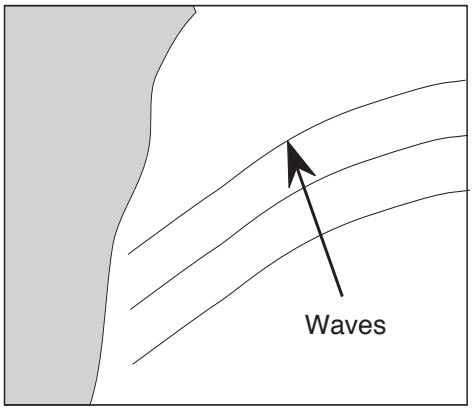
Q 3 Coastal spinifex is important to dune conservation because _____ .

Q 4 One type of breaking wave is called "surging". The other two are called _____ and _____ .

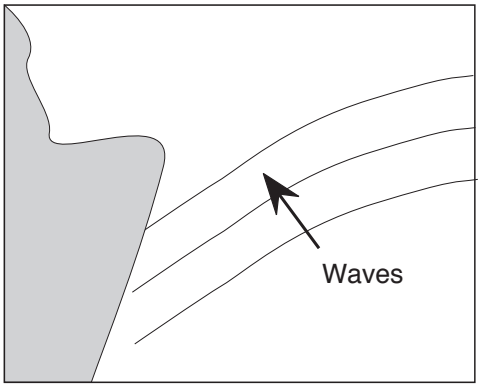
Q 5 Deep water currents may flow in a direction 180^0 to the wind blowing over the surface. What is the name given to this effect? _____ .

Q 6 The formula which relates the velocity, wavelength and frequency of a set of waves is? _____

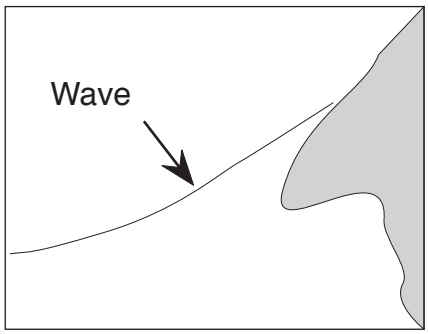
Q 7 This diagram shows waves approaching a beach. Draw an arrow to show approximate position and direction of maximum current flow.

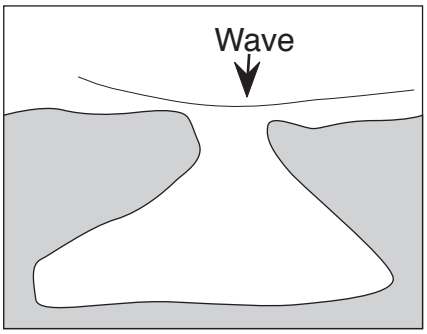


Q 8 This diagram shows waves approaching a headland. Draw an arrow to show approximate position and direction of current flow.

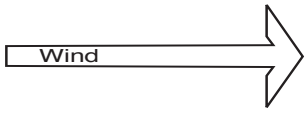


Q 9 These two diagrams show a wave approaching a shoreline. Draw the remainder of the wave pattern as the wave moves to the shore.



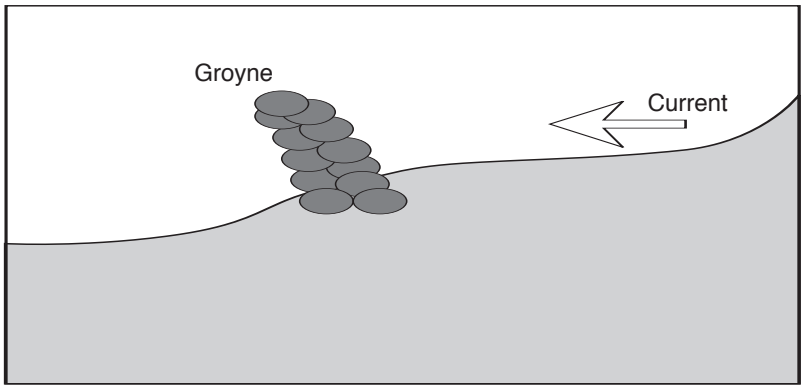


Q 10 The arrow shows the direction in which a wind is blowing over the ocean in the Southern Hemisphere.



Draw an arrow to show the direction in which the surface water will move.

The next four questions refer to the diagram below of a groyne erected on an open beach



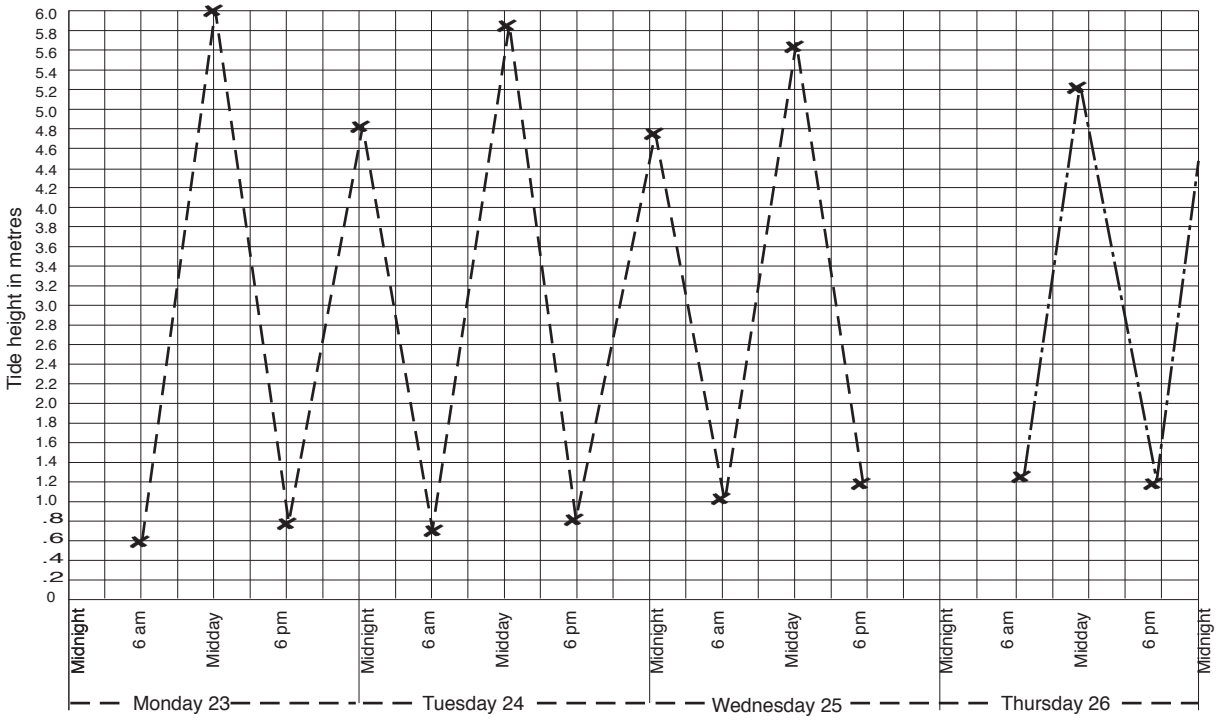
Q 11 Shade in the area in which sand build-up would occur.

Q 12 What does the term "headland by-passing" mean and show how this could occur in the diagram.

Q 13 What are two advantages and two disadvantages of groynes?

Q 14 Name one place where controversy has erupted in the press over groynes.

The next four questions refer to the graph below which shows the tide times and heights over a period of 4 days at Mackay in January. The moon was full on January 23.



Q 15 What was the maximum tidal range on Monday 23?

Q 16 Why are the two high tides each day of different heights? (A diagram may be useful.)

Q 17 Estimate the time and height of the missing tide.

Q 18 If the moon was full on Jan. 23, what pattern would you expect the tide heights to follow between Jan. 23 and Feb. 6?

Q 19 A build-up of sand immediately above the zone of wave action is called a:-

(a) Longitudinal dune.
(b) Chenier.
(c) Beach ridge.
(d) Berm.

Q 20 A long, narrow dune on top of mud or silt is called a:-

(a) Longitudinal dune.
(b) Chenier.
(c) Beach ridge.
(d) Berm.

Q 21 The length of water over which the wind blows is called the:-
(a) Low pressure area.
(b) High pressure area.
(c) Crest.
(d) Fetch.

Q 22 A wave will break when the height exceeds its length by:-
(a) 1/7.
(b) 4/7.
(c) 6/7.
(d) 1/1.

Q 23 A wave that gradually breaks with white water at the wave crest is a:-
(a) Surging wave.
(b) Plunging wave.
(c) Spilling wave.
(d) Sudden wave.

Q 24 Lines that are drawn perpendicular to wave crests and show the direction of wave energy are called:-
(a) Incident waves.
(b) Perpendiculars.
(c) Orthogonals.
(d) Reflected waves.

Q 25 A common depositional landform composed of sand that runs along a beach is known as a:-
(a) Groyne.
(b) Breakwater.
(c) Headland.
(d) Spit.

Q 26 The build up of sand on one side of a groyne is called:-
(a) Literal drift.
(b) A sand bar.
(c) Erosion.
(d) Accretion.

Q 27 The movement of air from high to low pressures is called:-
(a) A fetch.
(b) A high pressure gradient.
(c) Wind.
(d) A low pressure gradient.

Q 28 Beach ridges are most likely to form in areas where:-
(a) The sea is advancing into the land.
(b) The land is advancing into the sea.
(c) Neither sea nor land is advancing.

Q 29 The conversion for 60km/hr expressed as m/sec is:-
(a) 16.7 m/sec.
(b) 24.8 m/sec.
(c) 52.4 m/sec.
(d) 73.5 m/sec.

Q 30 When an object makes rapid, repeated motions, what is one complete motion called?
(a) A cycle.
(b) The period.
(c) The frequency.
(d) None of the above

Q 31 The time required for one cycle is called:-
(a) The velocity.
(b) The period.
(c) The frequency.
(d) None of the above.

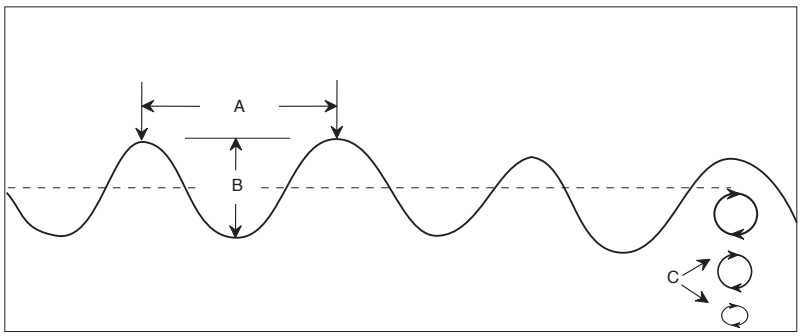
Q 32 If a fisherman counts 180 waves washing on the beach in 1 hour while he is waiting for a bite, what is the frequency of the waves?
(a) 20 waves per second.
(b) 1/20 wave per second.
(c) 20 cycles per second.
(d) 180 waves per cycle.

The next three questions refer to the diagram below

Q 33 The feature labelled A is the:-
(a) Wavelength.
(b) Crest.
(c) Trough .
(d) Wave height.

Q 34 The feature labelled B is the:-
(a) Wavelength.
(b) Crest.
(c) Trough.
(d) Wave height.

Q 35 The feature labelled C is the:-
(a) Wavelength.
(b) Crest.
(c) Trough.
(d) Orbit field.



Q 36 How fast is cyclonic wind blowing when a palm tree is clocked at travelling 580 metres in 2.5 seconds?
(a) 232 m/sec.
(b) 23.2 secs.
(c) 2.32 secs.
(d) 0.233 m/sec.

Q 37 Waves slow down as they approach the beach because they:-
(a) Lose their momentum.
(b) Get smaller.
(c) Lose energy.
(d) Gain energy.

Q 38 The formula to the right best describes:-
(a) Waves in the sea.
(b) Waves approaching the shore.
(c) Broken waves.
(d) Waves breaking against a cliff.

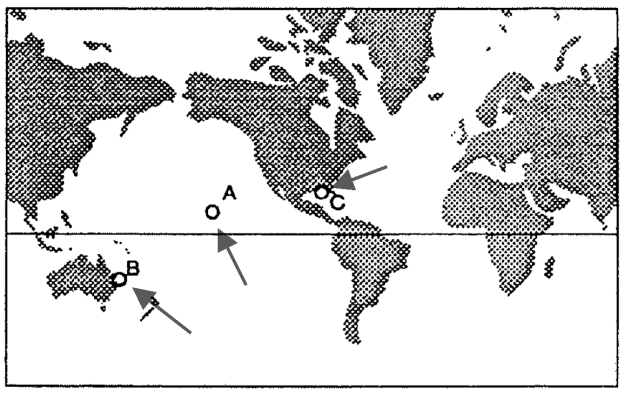
$$\frac{C_1}{C_2} = \frac{L_1}{L_2}$$

Q 39 The following description refers to which type of wave? These are waves which break gradually and have much white water at the crest. They are most common on gentle sloping sandy beaches, or at point surf at high tide.
(a) Plunging waves.
(b) Surging Waves.
(c) Spilling waves.
(d) Barrels.

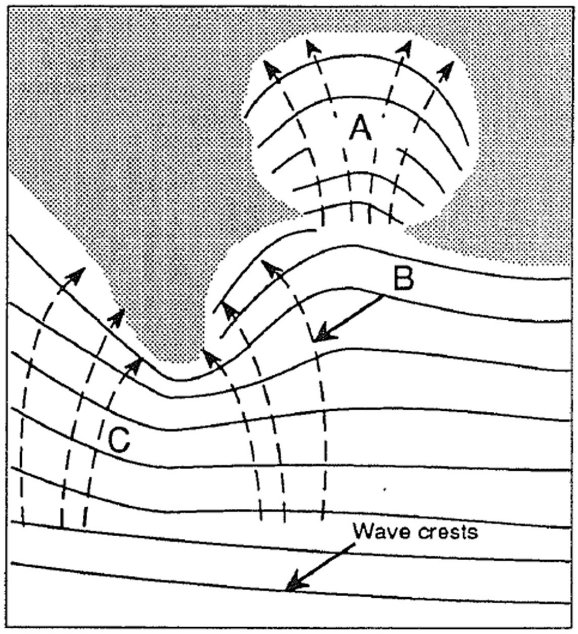
Q 40 The wave set up is the area of water:-
(a) Above no surf level.
(b) The swash zone .
(c) The surf zone.
(d) Both (a) and (b).

Q 41 The movement of water parallel to the shore caused by waves striking the beach at an angle, forcing water to move parallel to the shore best describes:-
(a) Rip currents.
(b) Sweeps.
(c) Long shore drift.
(d) Tidal flows.

Q 42 In the diagram to the right, which of the landmasses circled will have the biggest shoaling waves?
(a)
(b)
(c)



The next three questions refer to the diagram opposite



Q 43 The bending effect of waves as they travel into shallow water as shown by C is called:-

(a) Refraction.
(b) Reflection.
(c) Diffraction.
(d) Wave set-up.

Q 44 The lines in the diagram labelled B that are perpendicular to the wave crests are:-

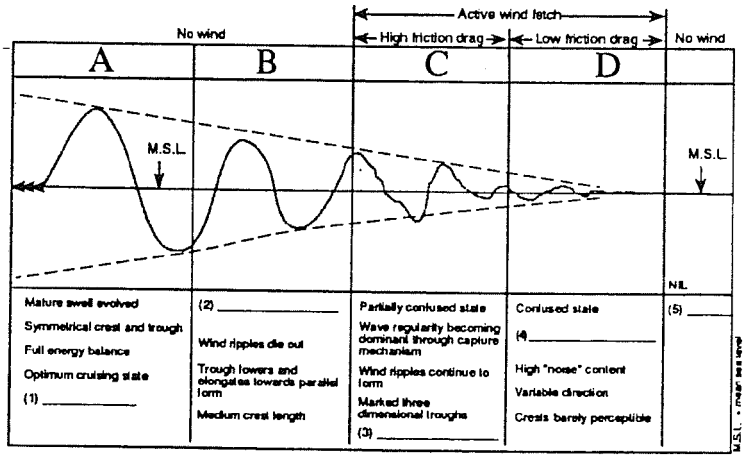
(a) Orthagonals.
(b) Diffracted lines.
(c) Refracted lines.
(d) Lines showing the direction of the transmitted energy.

.

Q 45 The bending effect of waves as they travel into the bay as shown by A is called:-

(a) Refraction.
(b) Reflection.
(c) Diffraction.
(d) Wave set-up.

The following questions refer to the diagram below



Q 46 Name the types of sea found in situation:-

A _____

B _____

C _____

D _____

Q 47 Complete the characteristics missing for 1, 2, 3, 4 and 5.

1 _____

2 _____

3 _____

4 _____

5 _____

The next three questions refer to the diagram below.

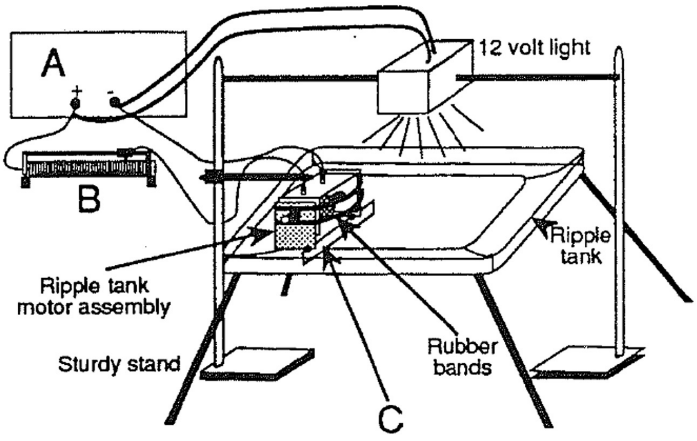
Q 48 Name the parts A, B and C of the ripple tank opposite.

Q 49 What is the function of the rubber bands?

Q 50 What does the motor in the ripple tank assembly do?

Q 51 How much water should you put into the tank?

Q 52 A wax block was placed in the middle of the tank with the motor going. Draw the effects you would observe around that block.



The next four questions refer to the diagram opposite

Q 53 Describe what is happening at C and D.

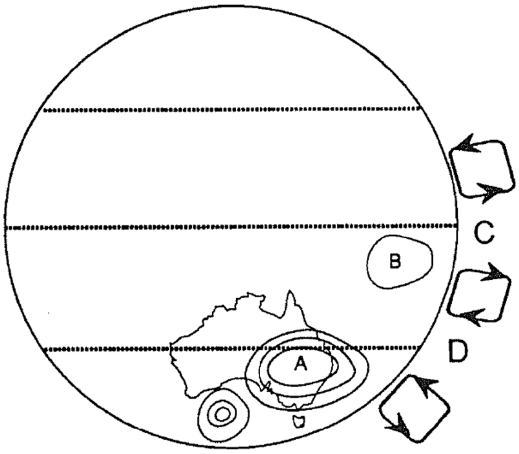
C _____

D _____

Q 54 Which way will A move? To the right or to the left? Why?

Q 55 What is B, which way could it move and why?

Q 56 What effects does it have when it reaches the coastline?



Q 57 Draw a diagram to illustrate what you understand by the term **wave diffraction.**

Q 58 Name 2 beach erosion control measures that are used on the Gold Coast and discuss their effects.

Q59 State the formula for the relationship between velocity, frequency and wavelength.

Q60 State the formula between period and frequency name the symbols used.

Q61 If someone said that waves were travelling towards a beach at 6, they would be wrong because they failed to state the units. What are the standard units for velocity?

Q 62 If waves in the sea have a length of 30 metres and velocity 28m/sec, how fast will they travel when they enter shallow water and change length to 18 metres?

Q 63 If waves travel at 15m/sec as they approach a shore, and have a length of 16 metres, how long will they be in the sea if they were travelling at 26m/sec?

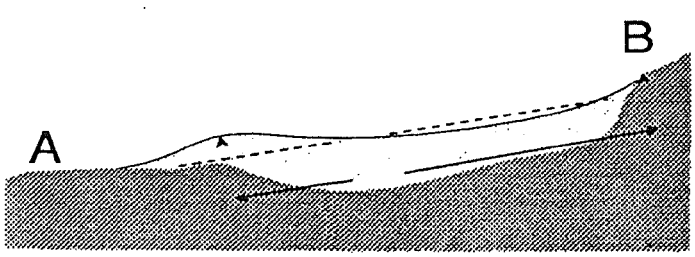
Q 64 The length of water over which the wind blows is called the:-
(a) Low pressure area.
(b) High pressure area.
(c) Crest.
(d) Fetch.

Q 65 The equation for limiting steepness of a wave is:-
(a) H / crest angle.
(b) Crest angle / H.
(c) H / λ.
(d) λ / H.

Q 66 A common depositional landform composed of sand that runs along a beach is known as a:-
(a) Groyne.
(b) Breakwater.
(c) Headland.
(d) Spit.

Q 67 The build up of sand on one side of a groyne is called:-
(a) Littoral drift.
(b) Sand bar.
(c) Erosion.
(d) Accretion.

The next two questions refer to the diagram below



Q 68 Mark in the position of the moon, the wave length and tide height.

Q 69 Would the tidal range be greater at A or B? Give reasons for your answer.

Q 70 The timing of tidal rise and fall of the ocean is influenced by the:-
(a) Sun.
(b) Moon.
(c) Sun and moon.
(d) Sun, moon and earth.

Q 71 Spring tides occur:-
(a) Every 2 months.
(b) Every 2 weeks.
(c) Every 2 days.
(d) Every day.

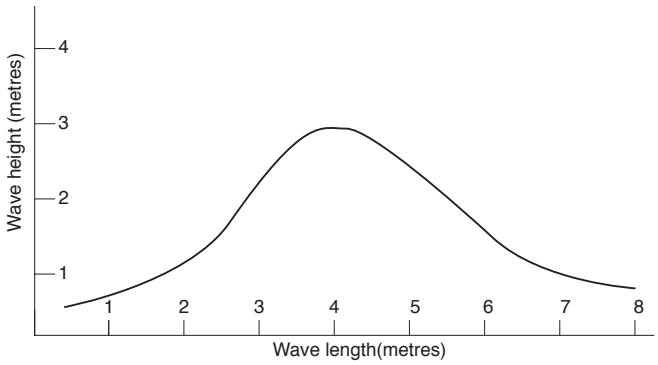
Q 72 A wave that gradually breaks with white water at the wave crest is a:-
(a) Surging wave.
(b) Plunging wave.
(c) Spilling wave.
(d) Sudden wave.

Q 73 Lines that are drawn perpendicular to wave crests are called:-
(a) Incident waves.
(b) Perpendiculars.
(c) Orthogonals.
(d) Reflected waves.

Q 74 What is the difference between wave refraction and wave diffraction? Use diagrams to illustrate your answer.

Q 75 Name 2 beach nourishment control measures that are used on the Gold Coast and discuss their effects.

The next question refers to the diagram of the wave below



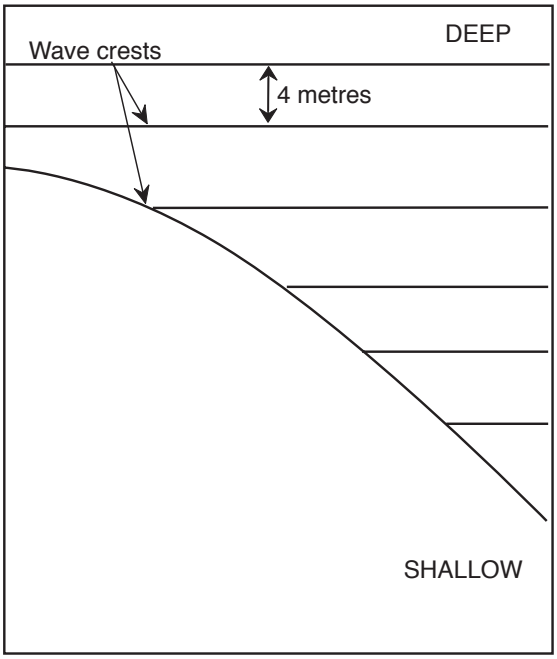
Q 76 Show calculations to determine if the above wave will break.

Q 77 What is the most important vegetation in holding beaches together?
(a) Casuarinas (She Oaks).
(b) High rise palm trees.
(c) Hibiscus plants.
(d) Grasses.

Q 78 The deposition of sand onto beaches by pumping or other means with the view to restoring an adequate buffer zone is called:-

(a) Accretion.
(b) Erosion.
(c) Replenishment.
(d) Long shore drift.

Q 79 Complete the blanks below (show calculations) and draw in the refracted waves.



F_1 =

V_1 = 20 m/sec.

λ_1 =

F_2 =

V_2 = 10 m/sec.

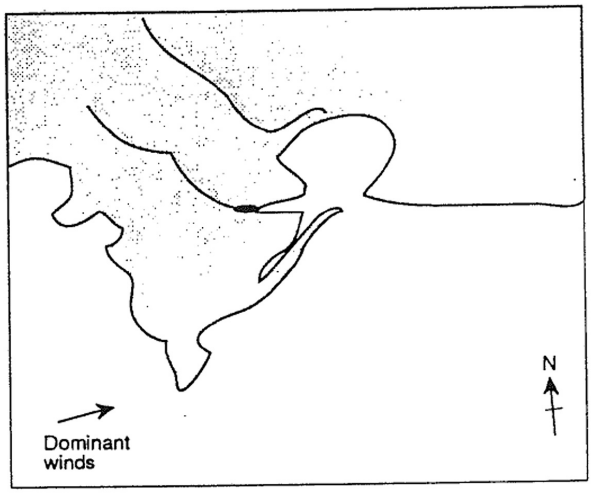
λ_2 =

The next question refers to the diagram below

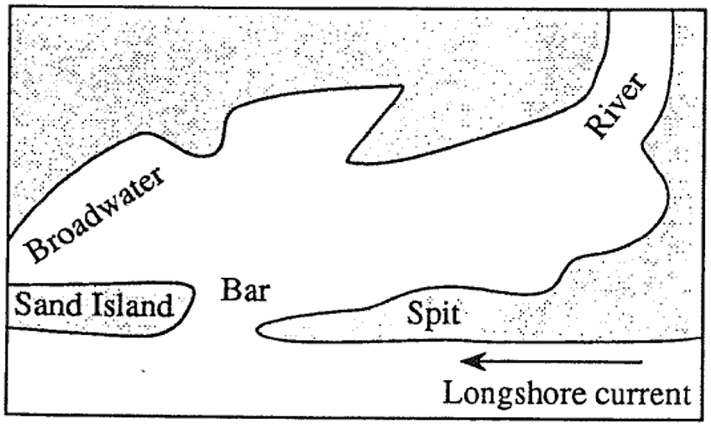
Q 80 Dominant wind direction is shown.

Draw the waves to show the following:-

(a) Incoming waves.
(b) Refracted waves.
(c) Diffracted waves.
(d) Long shore current.
(e) Orthogonals (3 sets).
(f) Spit.
(g) Headland.



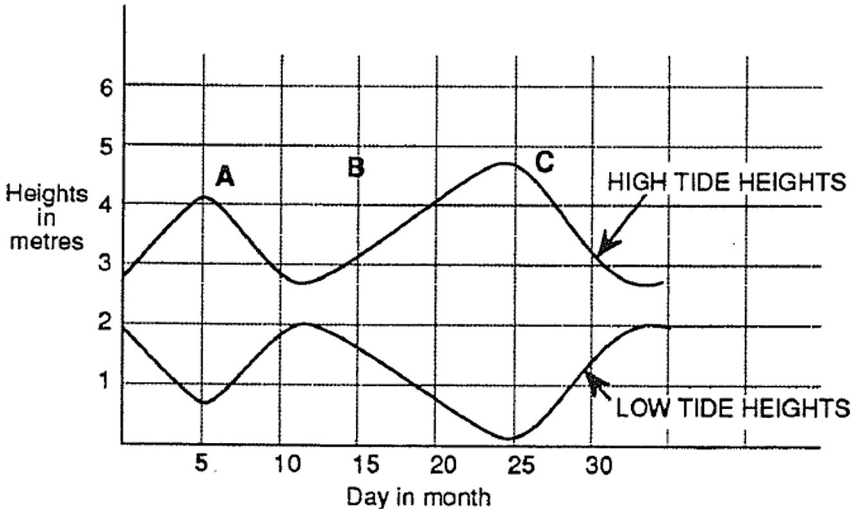
Q 81 In the diagram below the people of the town want the bar to be stabilised. Draw in any groynes and other features to ensure the long term stabilisation of this bar.



Explain your design criteria.

The diagram below relates to the next two questions

Below is a graph of high and low tide over a period of a month.



Q 82 Draw earth, moon, sun system diagrams to illustrate what is happening at A, B and C.

Q 83 What is the phase of the moon at position A and at position C?

Q 84 Tidal variation on the Gold Coast is about 2 metres, whereas at Broome in Western Australia it is much greater. Account for this difference.

Q 85 If 180 waves wash up on a shore in 1 hour, what is the time between waves in seconds?

Q 86 A wave moves 10 metres per second, how fast does it travel in km/hr?

Q 87 A wind produces waves with a wavelength of 2m and a frequency of 30Hz. What is the speed of the waves?

Q 88 Waves travel in the sea at a speed of 2.5m/sec. Their frequency is 2Hz. Calculate their wavelength.

Q 89 The speed and wavelength of waves in deep water is 15m/sec and 2.2m respectively. If the speed in shallow water is 10m/sec, what is their wavelength?

Q 90 Do you agree with the new Resort development on the Spit? Why?

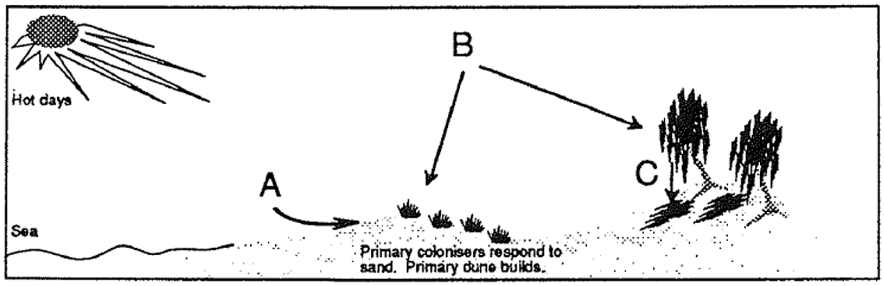
Q 91 Is it right or wrong to remove the she oaks in front of the Hotel? Why?

Q 92 Why is it wrong to break down the fences on the beach?

Q 93 Why is it wrong to destroy dune vegetation?

Q 94 Why is it wrong **NOT** to stick to the paths that the council has made down to the beach?

The next two questions refer to the diagram below

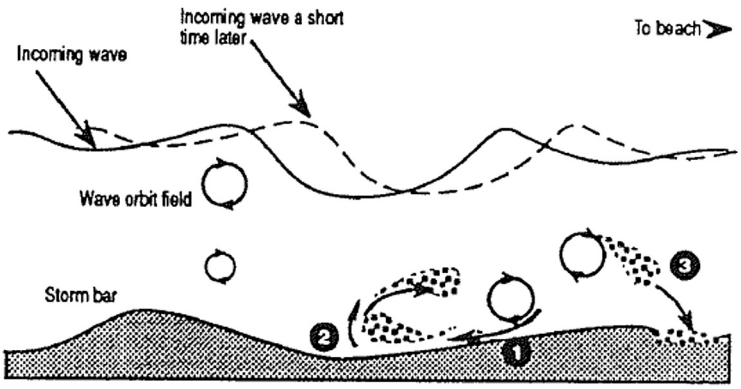


Q 95 What is happening at B and C?

Q 96 What is happening at A?

The next questions refers to the diagram oppsoite

Q 97 Describe what is happening at 1, 2 and 3.



Q 98 Name two coastal landforms formed by deposition.

Q 99 Predict what would happen to coral growth on the Great Barrier Reef if the sea level fell 100m in the next 5000 years, then rose gradually by 50m, to a level 50m above the present level. Diagrams would be useful.

Q 100 There are no coral cays in the middle part of the Great Barrier Reef. This may be because cyclones in this section are more frequent and more violent. How would this affect the formation of coral cays?

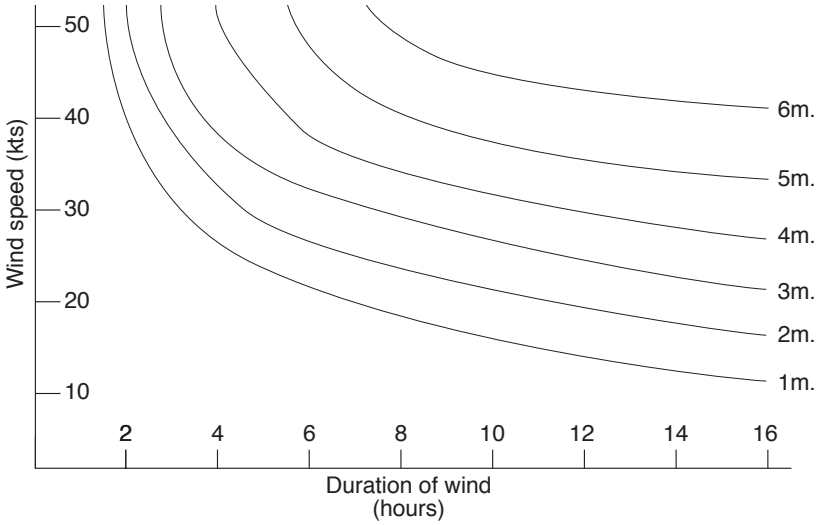
Q 101 Explain the formation of each of the following:-
(a) Blowout.
(b) Beach ridge.
(c) Foredune.

Q 102 A hilly region of sandy soil near a river is cleared of trees and used for cattle grazing. What could happen at the river mouth and nearby beaches?

Q 103 The major contribution that grasses make to stabilizing sand to form dunes is:-
(a) Providing a habitat for burrowing animals.
(b) Holding the sand while other vegetation takes hold.
(c) Reducing wind speed so that sand drops.
(d) Binding the sand with roots.

Q 104 A series of waves has wavelength 40m and velocity 5 m/sec. Calculate the frequency of the waves.

Use the graph below to answer the next three questions



Q 105 Find the wave height caused by a 30 knot wind blowing for 10 hours.

Q 107 Find the wave height caused by a 35 knot wind for a period of three hours.

Q 108 If waves are 3 metres high and a 30 knot wind is blowing, calculate the fetch of the wave-forming wind.

Q 109 Lines that are drawn perpendicular to wave crests and showing the direction of wave energy are called :-
(a) Incident waves.
(b) Perpendiculars.
(c) Orthogonals.
(d) Reflected waves.

Q 110 A commonly found depositional landform composed of sand that runs along a beach is known as a:-
(a) Groyne.
(b) Breakwater.
(c) Headland.
(d) Spit .

Q 111 What do you understand by the term "fetch"?

Q 112 Explain how wind forces produce ocean currents.

Q 113 Longshore drift on the east coast of Australia is northerly, because the fetch of the wind is:-
(a) Northerly.
(b) North easterly.
(c) South easterly.
(d) Southerly.

Q 114 A wave will break when the height of the wave is:-
(a) 1/3 the depth of water.
(b) The same as the depth of the water.
(c) 1 1/3 the depth of the water.
(d) 2/3 the depth of the water.

Q 115 With the aid of a diagram, explain how sand is moved up the beach by the wind.

Q 116 When the Southport Seaway was constructed an expensive sand by-pass system was installed. Why was this deemed to be necessary?

Q 117 Explain how the composition of rocks is important in the shaping of coastal landforms.

Q 118 Explain the process by which an offshore island may be produced from a headland as a result of wave action.

Q 119 A captain measures the wavelength of waves in a storm to be 20 metres, and their velocity to be 30 m/s. In order to cross a shallow bar safely the velocity of the waves must be less than 10 m/s. If s/he observes that the wavelength decreases to 12 metres when the waves enter the shallow water of the bar, will it be safe to cross or will the ship have to weather the storm?

Q 120 With the aid of diagrams outline the difference between **diffraction** and **refraction** of waves.

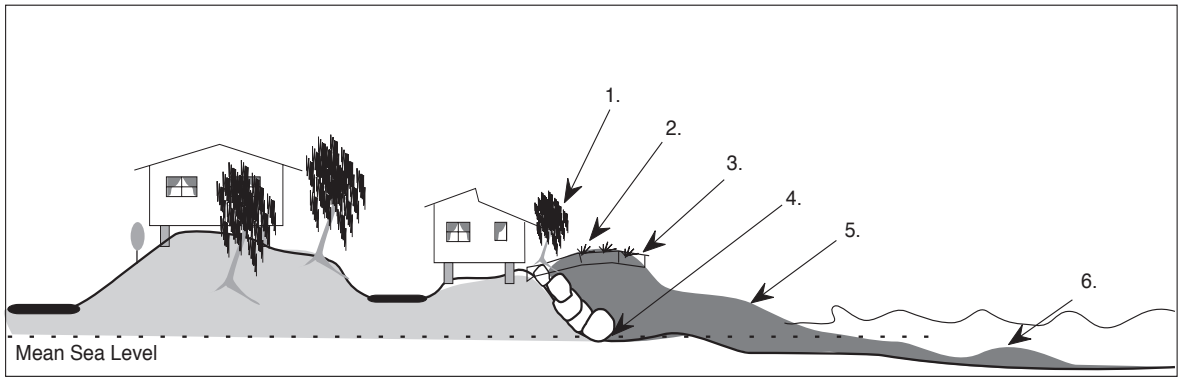
Q 121 The build up of sand on one side of a groyne is called:-
(a) Accretion.
(b) Revetment.
(c) Nourishment.
(d) Erosion.

Q 122 The type of wave which forms a tunnel as it breaks is:-
(a) A surging wave.
(b) A plunging wave.
(c) A spilling wave.
(d) A diverging wave.

Q 123 Longshore drift is:-
(a) The process by which sand is eroded from beaches.
(b) The process by which sand is transported by the currents.
(c) The process by which sand is blown along the beach.
(d) The process by which sand is formed from sedimentary rock.

Q 124 Succession is best described as:-
(a) Successful stabilization of the fore-dune by pioneering plants.
(b) Gradual change in the dominant plant species due to changing conditions.
(c) Gradual movement of dunes away from the water's edge due to the wind.
(d) Gradual movement of dunes towards the water's edge due to the wind.

The next question refers to the diagram below



Q 125 There is always a compromise where beach development has occurred too close to the beach. Such a compromise is shown above.

Modern beach nourishment methods have identified six things that can be done to maintain a sandy beach during all conditions. Name the six shown and can you list any others used in your local area?

The diagrams below represent two beach situations

Q 126 Which beach is eroding and which accreting?

Q 127 What types of waves occur at C and D?

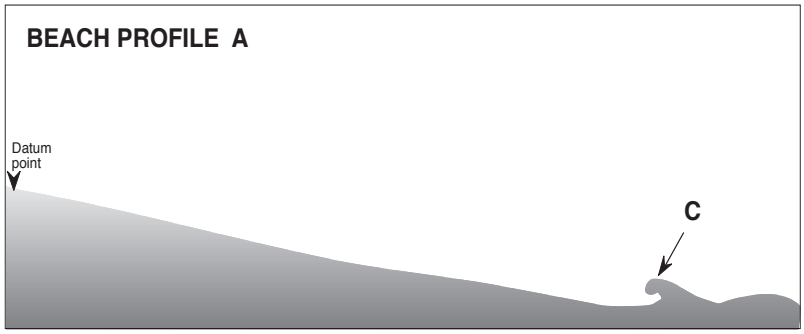
Q 128 What occurs at E and why it important to the beach?

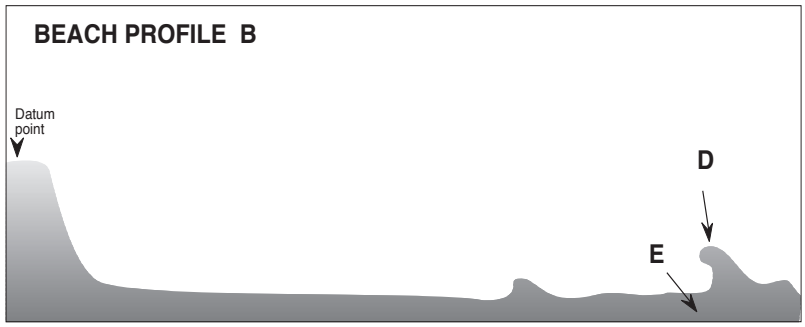
Q 129 Which has the greatest profile angle?

Q 130 What does the datum point mean?

Q 131 Mark in the high tide and low tide marks on both beaches.

Q 132 Assuming there are no storms for the next 12 months, redraw the beach profile in the box opposite.





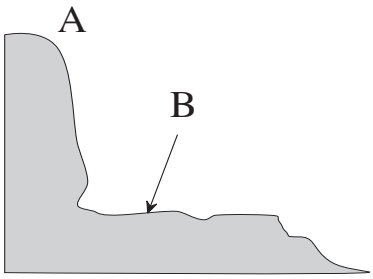
Beach profile C

The next question refers to the diagram below

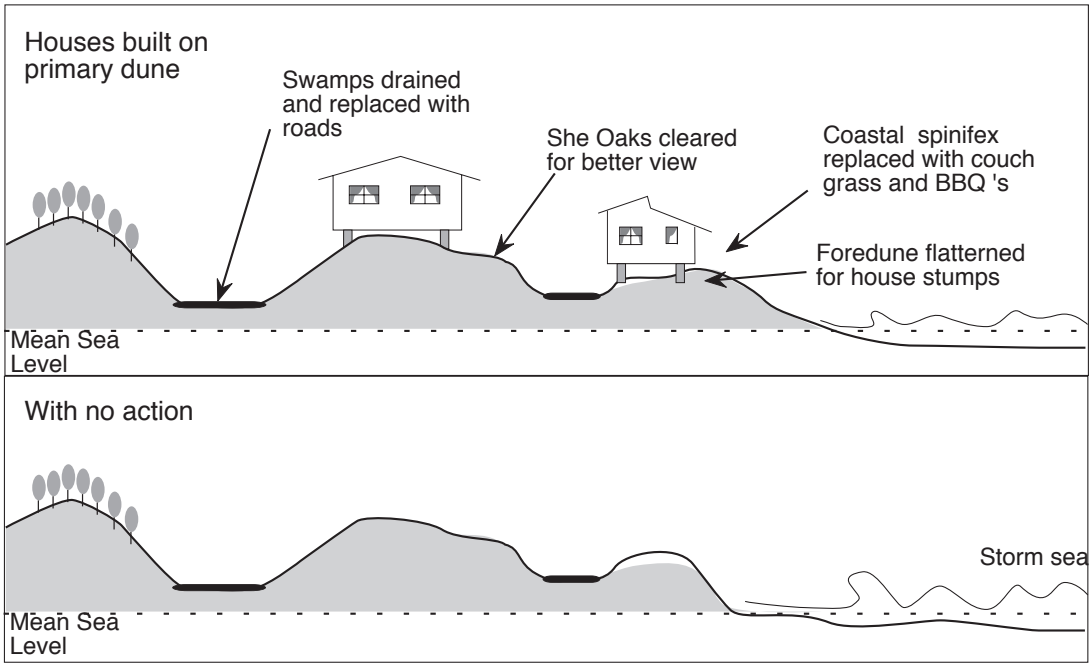
Q 133 What is A?

Q 134 What coastal feature is B?

Q 135 Mark in where high tide would occur.



The next two questions refer to the diagrams below



Q 136 Draw diagrams to show what could happen to the housing development given the information?

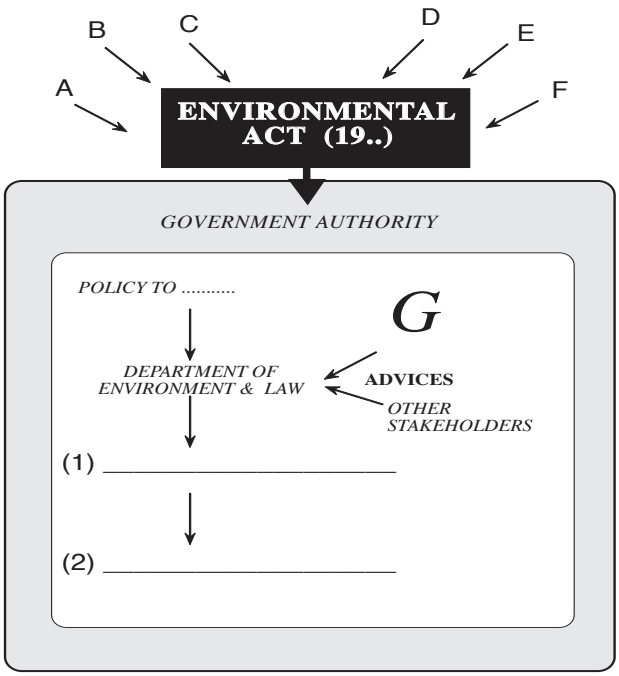
Q 137 Draw in diagram above the correct beach erosion control measures, given that the development cannot be relocated.

The next three questions refer to the diagram opposite

Q 138 Assign names to possible stakeholders A - F.

Q 139 Who are G and what do they do?

Q 140 Who are (1) and (2) in the diagram and what role do they play in the process of designing environmental law?

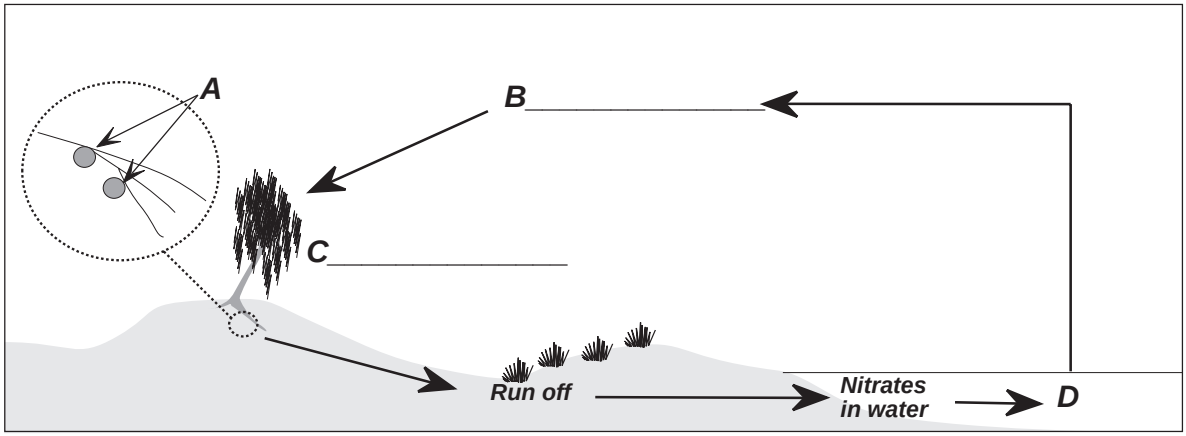


The next three questions refer to the diagram of the nitrogen cycle below

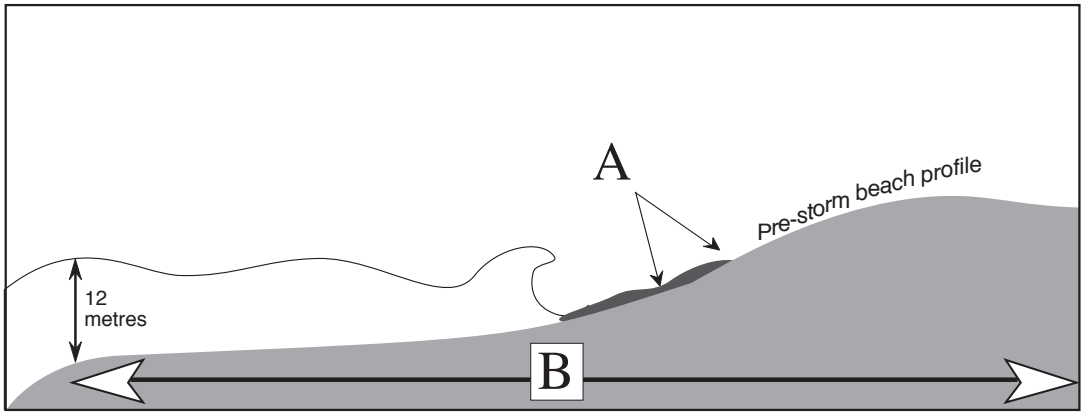
Q 141 Complete the missing parts of the diagram for B and C.

Q 142 What are the structures identified as A and what role do they play in the nitrogen cycle?

Q 143 What happens at D and name the organisms that make it happen?



The next three questions refer to the diagram of the nitrogen cycle below



Q 144 Is the beach in an accreting or eroding mode? Give reasons for your answer.

Q 145 After the wave breaks, water rushes up the beach as shown by A. This part of the wave is called a wave _____?

Q 146 The part of the beach system labelled B is called the:-

(a) Visible beach.
(b) Erosion scarp.
(c) Active beach system.
(d) Storm system.

147 Research Report

Conditions:
In class, under teacher guidance.

General Aims

(i) To examine the gradient of a beach from a point beyond the frontal dune to the water.

(ii) To examine the change in grain size of the beach sand along the line of transect.

(iii) To examine the rate of water absorption along the line of transect.

(iv) To observe the changes in (i), (ii) and (iii) over a period of time and determine the most suitable set of conditions for the maintenance of a stable beach.

Specific Objectives

(i) To construct a line of transect in order to
- (a) measure the profile of a beach
- (b) calculate the change in grain size down the beach
- (c) measure the absorption rate of water down the beach.

(ii) To manipulate apparatus in order to gather data and complete tables on (i) above.

(iii) To graph the data obtained.

(iv) To relate the three variables to the continued construction and maintenance of the beach.

(v) To compare and contrast data obtained from the beach over a period of time to determine the characteristics for a stable beach system.

Method
On each trip, use the techniques outlined to gather data on beach slope, grain size and absorption rate.
For each case, complete the graphs and answer the questions.

Once you have gathered data on your beach, answer the questions in the conclusion section of your report.

NOTE:- As you complete the requirements for each study of your beach, submit them for discussion. This will allow your teacher to give you immediate feedback and to continuously monitor your progress.

Beach transect

Organisation

* 3 groups of 6-7 members
  - (1) Slope: 2-3 members
  - (2) Grain size: 2 members
  - (3) Absorption: 2 members

Equipment

* Slope:-
  - * 2 x metre rules, 1 x spirit level
* Grain size:-
  - * 1 x grain size filter
  - * 1 x 100 ml graduated cylinder
  - * ? x sampling bags
  - * 1 x felt pen
* Absorption:-
  - * 1 x plastic tube
  - * 1 x 100 ml graduated cylinder
  - * 1 x stopwatch
  - * 1 x small bucket.

Method

(1) Slope:

(a) Start from a pre-determined reference point beyond the frontal dune. You must be able to find this point each time you return.

(b) Place one metre rule vertically on the sand (just touching).

(c) Lie the other rule horizontally down the beach with the spirit level in the middle.

(d) Raise the lower end of the rule until the level is reading horizontal.

(e) Record the height up the vertical rule in the data table (values may be +ve or -ve).

(f) Move the vertical rule to the other end of the horizontal rule, and continue down the beach to the water's edge.

* **NOTE:** Generally, the up-beach end will record the reading. However, if the down-beach end needs to be moved to make a level, record this as a positive reading (a rise in the profile). Readings below your start point should be recorded as negative.

(2) Grain size:

(a) Follow "slope" operators from station to station.
(b) At each station, gather sand to fill graduated cylinder (If the sand is wet, collect it in the sampling bags and return it to school to dry for later measurement).
(c) Remove any "debris" like large shells, vegetation, etc.
(d) Measure 100 ml of sand into the cylinder. Pour the sand onto the top of the filter and shake vigorously but carefully.
(e) Pour the contents of level 1 back into the cylinder and record the level. Discard, and repeat for the other levels (If a blockage occurs, start again).

(3) Absorption:

(a) Fill the bucket with sea water.
(b) Follow "slope" operators from station to station.
(c) At each station, insert tube to marked depth.
(d) Use the graduated cylinder to pour a measured amount of water down the tube.
(e) Measure the time taken for the water to be absorbed into the beach.
(f) Enter data in table.

Graphs

On the accompanying grids, graph the results from the three data tables.

(a) Select vertical and horizontal axes so that all data will fit and fill the page.
(b) Draw your graphs in lead pencil first and consult a teacher for checking.
(c) Complete the graphs in colour-coded pencil.
(d) The axes of subsequent corresponding graphs should be the same.

Assessment Criteria

Assessment of your report will be made using the criteria in the table below.

* Accurate completion of data table
* Graphs:- Appropriate axes, labelling and style
* Answers to questions. Your conclusions must be supported by your data
* Final Statement
* General presentation

Questions

For each set of data, answer the following:-

(1) On your graphs, identify the position of
(a) M.H.W. (Mean High Water)
(b) Berm
(c) Foredune Crest
(2) What is the average slope of the beach from the base of the foredune to the water?
(3) Where is the slope greatest? Why?
(4) Where is the slope the least? Why?

(5) How high is the crest of the foredune above M.H.W.?
(6) How far is the crest of the dune from M.H.W.?
(7) How does the grain size change up the beach? Where?
(8) How does the absorption rate change up the beach?

Research Report

Introductory Notes

The aim of this exercise is to compare and contrast the structure and composition of the beach you have investigated. Use your data, graphs and answers from BEACH TRANSECTS 1, 2 & 3 to answer the following questions.

Questions

(1) Discuss the differences (if any) that exist between the distance from M.H.W. to the foredune crest on each occasion studied. How do you explain this?
(2) Discuss the differences (if any) that exist between the height of the foredune crest above M.H.W. on each occasion.
How do you explain this?
(3) How do the relative grain sizes from each occasion compare? Why?
(4) How do the absorption rates compare? Why?
(5)* In view of your responses to ALL the questions in this report, write a brief paragraph (in point form), discussing the following points:
(a) the relationship between beach slope, grain size and absorption rate in protecting the stability of a beach.
(b) the differences in structure that have occurred during the course of your investigations with regard to the roles they play in protecting their dune systems from prevailing conditions.

Data tables

Date:___/___/___ Time:_____ Tide:_____

Wind direction & speed:_____

Other information:_____

	Slope		Grain Size		Absorption rate	
Position	Ht (cm)	ΔH	Size #	%	Time (s)	(ml/s)
0			1 2 3 4			
1			1 2 3 4			
2			1 2 3 4			
3			1 2 3 4			
4			1 2 3 4			
5			1 2 3 4			
6			1 2 3 4			
7			1 2 3 4			
8			1 2 3 4			
9			1 2 3 4			
10			1 2 3 4			

Q 148 Name two causes of tsunamis.

Q 149 Name three factors that can effect the salinity of seawater.

Q 150 Which colour of light penetrates the sea the greatest?

Q 151 Name any two factors which affect the density of the sea.

Q 152 What is the name given to the effect which causes the wind and current patterns to curve around the earth?

Q 153 What is the largest percentage of dissolved gas in the atmosphere?

Q 154 Discuss the physical character of sea water at a depth of 1000 metres (pressure, temperature and light are some of the factors to be discussed).

Q 155 Explain why a scientist is unlikely to find plant materials at a depth of 500 metres.

Q 156 Fishing fleets often look at areas of the ocean where surface water is being blown away from the coastline. Why is this so?

Q 157 Deep water ocean currents may flow in a direction 180^0 to the wind blowing over the surface. Explain how this occurs.

The next six questions require you to complete the sentence

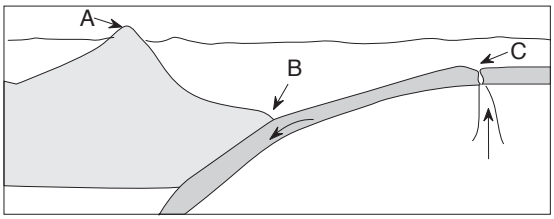
Q 158 Archimedes Principle states that " the buoyant (upthrust) force on a submerged object is equal to _____ .

Q 159 Displacement of a floating object is equal to _____ .

Q 160 The formula for density is _____ .

Q 161 The value for specific gravity for water is _____ .

Q 162 The approximate atmospheric pressure at sea level is _____ .



Q 163 The features labelled in the above diagram on an ocean floor are A ____ B ____ C _____ .

Q 164 What is one possible cause of the movement of the plates of the earth's crust?

Q 165 Explain how plate tectonics is related to the growth of coral reefs on islands.

Q 166 Guyots are undersea mountains with flat tops. The depth from the ocean surface to their tops may be 2000m or more. Draw an illustration of one and explain how they may have formed.

Q 167 Rocks on the ocean floor are rarely more than 600 million years old, while continental rocks may be 4000 million years old. Why?

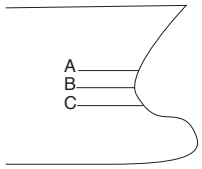
Q 168 Predict what would happen to coral growth on the Great Barrier Reef if the sea level fell 100m in the next 5000 years, then rose gradually by 50m, to a level 50m above the present level. Diagrams would be useful.

Q 169 There are no coral cays in the middle part of the Great Barrier Reef. This may be because cyclones in this section are more frequent and more violent. How would this affect the formation of coral cays?

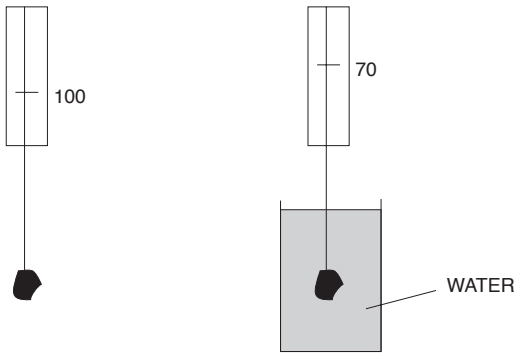
The diagram below shows the bows of a cargo ship. The lines indicate the water level on the side of the ship under different conditions

Q 170 Match the lines to the following situations.

1. Tropical fresh water [ ]
2. Tropical salt water [ ]
3. Polar salt water [ ]



Q 172 You hang a piece of rock from a spring scale. Its weight is 100 grams weight. Hanging from the same spring scale, but submerged in water, the reading is 70 grams weight. What is the buoyant (upthrust) force on the rock in grams weight?



Q 173 A hilly region of sandy soil near a river is cleared of trees and used for cattle grazing. What could happen at the river mouth and nearby beaches?

Q 174 Starting at the surface, the order of the layers in the earth are:-
(a) Core, mantle and crust.
(b) Core, crust and mantle.
(c) Crust, mantle and core.
(d) Crust, core and mantle.

Q 175 What is the appoximate percentage surface area of water on the earth?

Q 176 With the aid of a diagram explain the movement of particles in a wave. What is the principal on which a hydrometer operates?

Q 177 Why are indicators required when performing titrations?

Q 178 What do the following initials stand for?
(a) T.S.S
(b) B.O.D.

Q 179 List three factors which affects the amount of gas which will dissolve in sea water.

Q 180 Write the equation for the determination of chloride ion using silver nitrate.

Q 181 Often in estuaries the salinity is higher near the bottom than the top. Explain how this could be so.

Q 182 How are the factors of density and salinity related?

Q 183 Outline as fully as possible one method for measuring turbidity.

Q 184 List two (2) ways in which the bed rock of the ocean floor is different from that of the continental rock.

Q 185 Draw a simple sketch indicating the following topographical oceanic floor features:-
(a) Continental shelf.
(b) Continental slope.
(c) Contiental rise.
(d) Abyssal plain.
(e) Mid ocean ridge.

Q 186 Explain the process by which the plates of the earth's crust are caused to move.

Q 187 Name and explain the process by which nutrient rich water is brought to the surface of the oceans.

Q 188 Explain how wind forces produce ocean currents.

Q 189 On the map provided indicate the position, direction and name of five (5) major ocean currents of the world.

Q 190 The ocean surface waters are divided into two zones. What are they called?

Q 191 Outline the uses of Secchi Disk stating :-
(a) How it is used.
(b) How the Extinsion Coefficient is calculated.
(c) What is measures.

Q 192 The salinity of normal ocean water is :-
(a) 25%.
(b) 35%.
(c) 45%.
(d) 10% to 45%.

Q 193 Which of the following is not a cause of ocean currents?
(a) The tidal cycle.
(b) The wind.
(c) Density differences.
(d) Waves.

Q 194 Acidity is:-
(a) A ph of 7 or greater.
(b) The concentration of hydroxyl (OH^-) ions in solution.
(c) The concentration of hydrogen ($H^{+)}$ ions in solution.
(d) The concentration of hydrochloric acid dissolved in the water.

Q 195 When waves enter shallow water from deep water they:-
(a) Slow down and get further apart.
(b) Slow down and get closer together.
(c) Speed up and get further apart.
(d) Speed up and get closer together.

Q 196 A subduction zone is one in which:-
(a) New sea floor is produced.
(b) Crustal plates come together producing a mountain range.
(c) One crustal plate moves under another plate.
(d) An undersea volcano forms an island.

Q 197 Longshore drift on the east coast of Australia is northerly, because the fetch of the wind is :-
(a) Northerly.
(b) North easterly
(c) South easterly
(d) Southerly.

Q 198 The area where one plate is moving over another is called the?

(a) Subtraction zone.
(b) Subduction Zone.
(c) Spreading Zone.
(d) Collision Zone.

Q 199 An oceanographer who was studying deep sea life wrote " Animals living at threat depths are very difficult to study, since any change in conditions seems to adversely effect them." Explain why this statement is correct.

Q 200 A Hydrometer was calibrated against sea water samples of known salinity levels and the S.G. readings noted.

Salinity (%)	Reading (S.G.)
5	1.004
10	1.008
15	1.011
20	1.015
25	1.019
30	1.023
35	1.026
40	1.030

(a) Draw the calibration curve.
(b) Determine the salinity of an unknown sea water sample which has a reading of 1.025.
(c) Explain why it is important to calibrate the hydometer.

Q 201 Sand grains come in a variety of shapes and sizes, but close examination of a beach reveals that the sizes are not evenly distributed from the head of the beach to the water line. Draw a diagram and indicate where you would expect to find large, medium, and fine sized grains, and give the reasons why you would expect this distribution.

Answer the next eight questions TRUE OR FALSE

Q 202 The epipalegic zone contains the photic zone within it.

Q 203 There are no producer organisms in the dark regions of the oceans.

Q 204 The bathyplageic zone extends from 200m to 1000m in depth.

Q 205 The Australian plate is moving southward at a rate of 8cm per year.

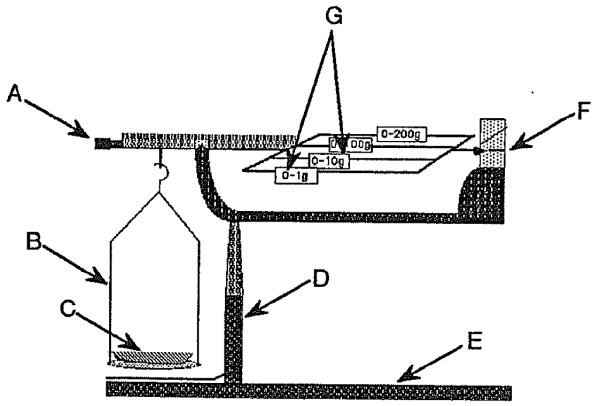
Q 206 Ocean currents always flow in the same direction.

Q 207 The *R.V. Franklin* is a military oceanographic research vessel.

Q 208 The outermost layer of the earth is called the Asthenosphere.

Q 209 The deepest part of the ocean is 4km.

The following questions refer to the operation of a laboratory balance

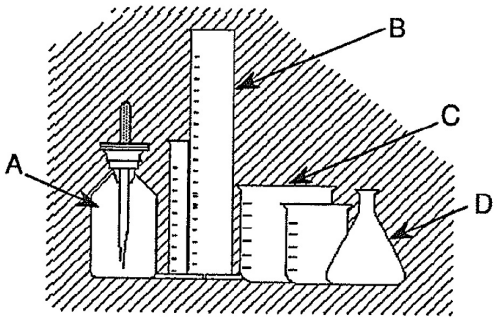


Q210 Name the parts of the balance labelled in the diagram above.

Q211 Describe how to zero a balance.

Q212 A student measured out 5.679g of solid on a cent-o-gramme balance. Another student said he could not have done this. Why?

Q213 Write the names of the pieces of lab equipment (A - D) below:-



Q 214 List any five steps you need to do in writing a scientific report and write one sentence why they are done.

Q215 Draw a **fully labelled diagram of** a water molecule.

Q216 Draw a crystal lattice of salt in the space below and describe how salt dissolves in water.

Q 217 The Antarctic and Australian Plates were at one time one plate. They seem to have separated from each other:-

(a) 2 M years ago.
(b) 60 M years ago.
(c) 150 M years ago.
(d) 750 M years ago.

Q 218 Which of the following is **NOT** in chronological order?
(a) Solar system forms, first cell, sponges seen.
(b) Sponges seen, first pine trees, dinosaurs die off.
(c) Ice sheets in Sahara Desert, dinosaurs die off, Iceland forms.
(d) Corals develop, dinosaurs die off, sponges seen.

Q 219 Some time in the future it is expected that Australia will become part of:-
(a) Asia.
(b) Antarctia.
(c) Africa.
(d) South Americia.

Q 220 The "Ring of Fire" is a region circling the Pacific Ocean which is caused by:-
(a) Sea floor spreading.
(b) Convergent plate boundary.
(c) Coriolis effect.
(d) Centrifugal force.

Q 221 "Hot Spots" is the term applied to regions of weakness in the crustal plates through which lava from upwellings of the magma inside the earth may flow. Evidence of these in the Capricorn Reef region and in a line down the east coast of Australia show that:-
(a) It was a lot hotter in that region during the Ice Age.
(b) The Australian plate moved north.
(c) Coral reefs once grew in southern Tasmania.
(d) Coral was widespread south of here many millions of years ago.

Q 222 Explain the formation of the Capricorn Basin with reference to the Paleocene and Eocene Periods.

Q 223 Discuss what can be concluded by the presence of volcanoes at Waddy Point on Fraser Island.

Q 224 Distinguish between the terms *CONTINENTAL CRUST* and *OCEANIC CRUST*.

Q 225 Name three main parts of the Earth.

Q 226 Draw a diagram of the continental margin showing the following parts:-
(a) Continental platform.
(b) Offshore islands and reefs
(c) Deep sea floor
(d) Estuaries

Q 227 Name any **TWO** plates in the Pacific.

Q 228 What does the *Theory of Plate Tectonics* postualte?

The following criteria sheet refers to a practical examination in which students are required to determine salinity by an eye drop salinity test of an unknown sample.

Criteria

* 1. Materials brought to examination.

* 2. Selecting the water sample and correct selection of pipette.

* 3. Use of pipette for collection of water sample.

* 4. Knowledge of method of water sample collection .

* 5. Use of pipette for collection of potassium dichromate.

* 6. Knowledge of method of indicator addition.

* 7. Knowledge of method of reagent to use.

* 8. Use of pipette for the addition of $AgN0_3$.

* 9. Knowledge of determination of salinity.

* 10. Determination of salinity.

The following criteria sheet refers to a presentation in which students are required to determine salinity by an eye drop salinity test of an unknown sample

Criteria

* The difference between observation and interpretation.
* Demonstrated understanding of qualitative and quantitative data.
* Roles of observation and interpretation.
* Need to draw standard calibration graphs and data tables.
* Lists of inaccuracies in equipment used to collect data.
* Experimental and control variables.
* Problems with control variables.
* Traditional methods used to investigate problems.
* Alternative, innovative and entrepreneurial methods.
* Lateral thinking and problem solving approaches.
* Respect for equipment.
* Co-operation in planning and implementation.
* Correct use of equipment.

ISBN
978-1-86283-124-7