



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

MARITIME ECONOMICS

NOVEMBER 2022

MARKS: 300

TIME: 3 hours

This question paper consists of 12 pages.



INSTRUCTIONS AND INFORMATION

1. Please check that your question paper is complete.
2. Read the questions carefully before answering.
3. Answer all questions.
4. Answer the questions in the same order that they appear on the question paper.
5. Show all working where calculations are involved.
6. It is in your own interest to write legibly and to present your work neatly.



QUESTION 1: THE MARITIME WORLD

- 1.1 Until the 1930s, Port X used to be an important coal bunkering place for ships trading between Port A and Port B. In 1935, the tonnage of coal bunkers taken by ships was 1 250 344 tons. By 1955, this total had been reduced to 21 040 tons and now, no ships call for coal bunkers.
- 1.1.1 Explain why there has been a reduction in the number of ships calling for coal bunkers at Port X. (6)
- 1.1.2 How will this change have affected the maritime sector of Port X? (8)
- 1.2 Some shipowners are investigating more environmentally friendly means of propulsion for their ships.
- 1.2.1 Name TWO types of environmentally friendly energy that are of interest to some shipowners for use as fuel in their ships. (4)
- 1.2.2 Besides alternative means of propulsion or alternative fuel, give TWO ways in which shipowners are trying to make their ships more "environmentally friendly". (4)
- 1.3 Study the information below. It represents the average freight rates (per ton of cargo in US\$) for particular routes for Capesize COAL carriers for a particular year. Now answer the questions that follow.
- | | JULY | NOVEMBER |
|------------------------|-------|----------|
| Brazil-China | 24,45 | 27,34 |
| Brazil-Rotterdam | 20,33 | 24,54 |
| Richards Bay-China | 22,78 | 24,55 |
| Richards Bay-Rotterdam | 20,45 | 22,32 |
- 1.3.1 What is a Capesize ship? (4)
- 1.3.2 Which route shows the greatest increase in rates from July to November? (6)
- 1.3.3 Give TWO possible reasons for the change in rates on the route you gave for your answer to QUESTION 1.3.2. (4)
- 1.3.4 What is the overall trend in the rates from July to November – FIRMING or SOFTENING or STEADY? (2)
- 1.3.5 Look at the rates to China. Why are the rates for the Brazil-China route higher than for the Richards Bay-China route? (2)
- 1.3.6 If a ship is chartered to move 178 000 tons of coal from Richards Bay to China in July of that year, how much will she earn for the voyage? (6)



1.3.7 Through which Convergence Zone is the ship likely to pass en route from Richards Bay to China? Choose your answer from the list below.

SUEZ CANAL; PANAMA CANAL; STRAITS OF GIBRALTAR;
STRAITS OF MALACCA; STRAITS OF HORMUZ; STRAITS OF
DOVER

(2)

1.4 Study the list of tanker types below and answer the questions that follow.

VLCC; SUEZMAZ; AFRAMAX; PRODUCT TANKER; SHUTTLE TANKER;
CHEMICAL TANKER; GAS TANKER

1.4.1 Which tanker type would be best to bring crude oil from an offshore storage rig to Hamburg in Germany for refining?

(2)

1.4.2 Which tanker type would be best to move 150 000 tons of crude oil from Kuwait in the Arabian Gulf to an oil terminal in the Mediterranean Sea?

(2)

1.4.3 Which tanker type would be best to move LNG from Qatar in the Arabian Gulf to Japan?

(2)

1.5 Many of the world's seafarers are drawn from developing countries as fewer western people now choose seafaring as a career.

1.5.1 Which country supplies more seafarers than any other country?

(2)

1.5.2 Give TWO reasons for the decline in the number of western seafarers.

(4)

[60]



QUESTION 2: SHIPPING OPERATIONS

2.1 The Supramax bulker *Katarina G* (Length 210 metres; loaded draught 12,5 metres and registered in Cyprus) was approaching Walvis Bay (Namibia) to discharge 32 950 tons of wheat, originating from La Plata Granary, La Plata in Argentina, and destined for Namibian Grain Milling Company, Windhoek, inland from Walvis Bay. In number 5 hold was 8 250 tons of wheat destined for Tsumeb Grain Mills, Tsumeb, Namibia, also inland from Walvis Bay.

In the thick fog and at spring high tide at 00:01 on 25 July, she grounded on the western side of Pelican Point at the entrance to Walvis Bay. Despite her Master attempting to refloat the vessel, she remained fast on the sandy beach.

He requested tug assistance and the salvage tug *Benguela* sailed from Walvis Bay harbour to try to refloat the ship. As there was no immediate danger to the ship, the crew remained aboard.

When the tug could not refloat the ship immediately, a salvage team came from Cape Town to assist and to bring the vessel's bunker oil ashore. They connected pipes from the ship to the tug that was able to take off 478 tons at a time, take it to Walvis Bay and discharge it into tanks ashore.

At the next spring high tide 13 days later, the tug managed to pull the ship off the beach and towed her into Walvis Bay. Divers inspected her hull and found that some damage had been caused by the grounding, but as no leaks had occurred, surveyors decided that she could discharge her cargo in Walvis Bay. Discharging operations began at 12:00 on 10 August.

Once discharging had been completed, she went to Cape Town for drydocking where repairs would be carried out. The cost of repairs and refloating amounted to \$4 500 400.

The cargo was not damaged. *Katarina G* was covered for all forms of marine insurance.

- 2.1.1 When the tug left Walvis Bay, her owners had negotiated a salvage agreement with the ship's owners for a "no-cure-no-pay" operation. What is the proper name for this agreement? (2)
- 2.1.2 When they realised that the ship could not be refloated immediately, the tug owners changed that agreement to another and the tugowner instructed the tugmaster to assist with taking the oil from the wrecked ship. What is the name for that other agreement? (2)
- 2.1.3 Can the tug claim salvage from this operation? Give a reason for your answer. (4)



- 2.1.4 Assume:
- *Katarina G* had taken a full stem of heavy fuel oil in her previous port;
 - her capacity for heavy fuel is 2 118 tons;
 - the voyage from her previous port to Walvis Bay took 18 days; and
 - during the voyage, she used 38 tons of heavy fuel per day at sea.
- (a) How many tons of heavy fuel did she consume during her voyage from Argentina? (6)
- (b) How many tons of heavy fuel did she have on board when she went aground? (6)
- (c) How many trips to Walvis Bay did *Benguela* have to make to discharge the oil? (6)
- 2.1.5 Explain why it is so important to try to avoid oil spillage at sea. (10)
- 2.1.6 Why was the refloating operation easier when the spring high tide occurred? (6)
- 2.1.7 The owners of *Katarina G* discuss with their lawyers and insurers whether they should declare General Average. Can the owner declare General Average? Answer YES or NO. (2)
- 2.1.8 What kind of marine insurance covers EACH of the following?
- (a) The damage to the ship (2)
- (b) The hire of the tug to move the fuel oil to Walvis Bay harbour (2)
- (c) An injury to the Second Mate as he was securing the towing line from the tug (2)
- 2.1.9 What is the role of the ship's Classification Society regarding this accident? (6)
- 2.2 What term is given to EACH of the following?
- 2.2.1 The rank of the navigating officer who is immediately senior in rank to the Second Mate (2)
- 2.2.2 The process used to settle disputed marine insurance claims (2)
- 2.3 How many bills of lading will be used for the cargo of wheat carried by *Katerina G*? (2)
- 2.4 Which government departments would the agent for *Katarina G* need to inform that the vessel was due at Walvis Bay? (6)



2.5 The cargo carried by *Katarina G* was as follows:

1 HOLD:	6 850 TONS WHEAT
2 HOLD:	8 650 TONS WHEAT
3 HOLD:	8 750 TONS WHEAT
4 HOLD:	8 700 TONS WHEAT
5 HOLD:	8 250 TONS WHEAT

She has five cranes that, **working simultaneously**, discharged the ship in Walvis Bay. Each crane could discharge on average 50 tons of grain per hour.

2.5.1 Which hold will determine the length of time the discharging operation would take? (2)

2.5.2 How many hours will the discharging operation take? (6)

2.5.3 How will the wheat cargo be transported to Windhoek and Tsumeb? (2)

2.5.4 Irrespective of your answer to QUESTION 2.5.3, assume that the discharging operation took 8 days and that she sailed from Walvis Bay at 00:01 on 24 August, she arrived in Cape Town at 00:01 on 28 August, and after drydocking, she sailed for La Plata in Argentina at 23:59 on 5 September when she resumed her charter.

(NOTE: *Katarina G* had been taken on an eight-month charter by La Plata Granary to move this cargo to Walvis Bay, and thereafter to move four other wheat cargoes from Argentina to Mombasa in Kenya.)

(a) What is the term for a chartered ship not being able to fulfil the requirements of the charter? (2)

(b) For how many days was *Katarina G* not able to fulfil the requirements of the charter? (6)

(c) What is the term for the type of charter where *Katarina G* was chartered for eight months? (2)



- 2.6 The following message was received by Plata Shipping, the port agents at La Plata, Argentina, for *Katarina G*. Ships arriving to load grain usually undergo inspection by surveyors in the anchorage before berthing.

ETA PILOT STATION LA PLATA 00:01 16/09 FOR PILOTAGE TO ANCHORAGE FOR PRE-LOADING INSPECTION. PREVIOUS PORTS (LAST CALL GIVEN FIRST) CAPE TOWN, WALVIS BAY; LA PLATA; RICHARDS BAY; SINGAPORE; MUMBAI; GIBRALTAR; ROTTERDAM; ANTWERP, SALDANHA BAY. DRAUGHT FORWARD 6 METRES AFT 6.5 METRES. REQUEST FREE PRATIQUE. REQUIRE STORES AS PER LIST EMAILED TO YOU 13/09. I CONFIRM THAT I RECEIVED VOYAGE INSTRUCTIONS LA PLATA TO MOMBASA.

HOLDS SWEEPED, CLEAN AND DRY AS PER INSTRUCTIONS. PLEASE ENSURE THAT IMMIGRATION, CUSTOMS AND VARIOUS SURVEYORS MEET THE SHIP ON ARRIVAL IN ANCHORAGE.

ZAMATA, MASTER KATARINA G

- 2.6.1 Study the Master's message.

- (a) Who will supply the stores for the ship?

Choose from: AGENT or OWNER or CHANDLER or CHARTERER or SHIPBROKER (2)

- (b) Quote a sentence from the message that indicates that the Master will know exactly what is expected for the voyage from La Plata to Mombasa. (2)

- (c) Quote the part of the message that refers to the fact that the Master wishes port health authorities to clear the ship as no one on board is suffering from any serious illness. (2)

- (d) Why must the holds be swept clean and dry on arrival in La Plata? (4)

- (e) Why did the Master need to provide the draught of his vessel? (2)

- 2.6.2 What is the name of the document that is the agreement governing the chartering of a ship? (2)

- 2.6.3 Surveyors are to meet the ship in the anchorage.

- (a) Two surveyors arrive on board the ship. Whom is each likely to represent? (4)

- (b) Why does the Master want the surveyors to board the ship in the anchorage and not wait until the ship is alongside the loading terminal? (2)



2.6.4 It had been agreed that loading would be done within 36 hours, but it took 42 hours.

(a) Is demurrage or dispatch payable in this case? (2)

(b) Who pays whom in this case? Choose your answer from the following:

SHIPOWNER PAYS CHARTERER or CHARTERER PAYS
SHIPOWNER or SHIPOWNER PAYS AGENT or AGENT
PAYS CHARTERER (2)

2.6.5 Referring to the message from the Master of *Katarina G* and from your own knowledge of shipping, list FOUR items of expenditure that will appear on the disbursement account that the agent will prepare to send to the vessel's owner once the ship has left La Plata.

(8)
[120]



QUESTION 3: INTERNATIONAL TRADE

- 3.1 Refer to the message sent by the Master of *Katarina G* in QUESTION 2.6.
- 3.1.1 In terms of an IMO code, her last 10 ports of call are listed. Name the IMO code that, among other requirements, requires ships to list these ports before clearance is given by the Port State Control. (2)
- 3.1.2 Look at the list of ports. How many times did *Katarina G* come to South Africa? (2)
- 3.1.3 Between which TWO ports did she pass through the Suez Canal? (4)
- 3.1.4 *Katarina G* is owned in Greece and registered in Liberia. She has been chartered to an Argentine company to move wheat from Argentina to Kenya. She has officers from several countries and Filipino ratings.
- (a) What flag would be flown at the stern when she is loading the wheat in La Plata? (2)
- (b) Give TWO reasons for the owner wishing to register the ship in Liberia instead of in Greece. (4)
- (c) Give TWO reasons for the owners wishing to employ a Filipino crew instead of a Greek crew. (4)
- (d) Which country would exercise its responsibilities as Flag State Control in this instance? (2)
- (e) *Katarina G* might be regarded as a vessel flying a flag of convenience, and some people view this negatively. Giving reasons for your answer, provide your opinion on this matter. (10)
- (f) Referring to *Katarina G* and her voyage carrying Argentine wheat to Kenya, explain why a country's maritime law must conform to international maritime law and to the various codes and conventions associated with international maritime trade and shipping. (10)
- 3.2 The grain is being carried by *Katarina G* in terms of the Incoterm CIF (Cost of Insurance and Freight). Who pays for EACH of the following?
- (Choose your answers from THE CARRIER or THE SHIPPER or THE CONSIGNEE.)
- 3.2.1 The movement of the grain from the ship to the consignee's premises (2)
- 3.2.2 The loading of the grain into the ship in La Plata (2)



- 3.3 Virtually all consignments of iron ore exported from Saldanha Bay are shipped in terms of the Incoterm FOB (Free on Board). This means that the consignee pays for the ocean leg of the voyage and therefore can choose which ship will carry the iron ore. Why could it be more beneficial to South Africa if iron ore export cargoes were shipped from Saldanha Bay in terms of CIF (Cost of Insurance and Freight) where the shipper pays for the ocean leg of the voyage and therefore can choose which ship will carry the cargoes?

Clue: Think of whether South African ships could carry the cargoes and the benefits that would bring.

(8)

- 3.4 Cape Agulhas is an extremely important convergence zone in international shipping.

3.4.1 Give TWO important cargoes (EXCLUDING OIL) that pass Cape Agulhas on a regular basis.

(4)

3.4.2 Give the main source of the oil cargoes that pass **eastbound** past Cape Agulhas.

(2)

3.4.3 Into which ocean will an eastbound tanker steam once she has passed Cape Agulhas?

(2)

3.4.4 About 80 merchant ships pass Cape Agulhas every day. Some of the ships passing Cape Agulhas will call at South African ports to discharge or load cargo. Some will call only for bunkers. The rest pass by without calling at South African ports. An economist has estimated that, besides the fuel purchased in a South African port, every ship calling only for bunkers will pay about R1 million for other services while she is in a South African port.

NOTE: For the subquestions (a) to (c) below, round off your answers to the NEXT ship, e.g. 8.4 ships will become 9 ships; 11,8 ships will become 12 ships.

(a) On average, how many ships will pass Cape Agulhas every hour?

(6)

(b) On average, how many ships will pass Cape Agulhas each year?

(6)

(c) If five per cent of the ships passing Cape Agulhas can be attracted to bunker in a South African port, how many ships a year will call only to bunker in a South African port?

(6)

(d) How much revenue could be earned by South African ports in a year, excluding fuel – as estimated by that economist?

(6)

(e) Give THREE services (excluding fuel) for which a ship may have to pay while calling only to bunker.

(6)

[90]

QUESTION 4: MARITIME ENVIRONMENTAL CHALLENGES

- 4.1 When *Katarina G* is 120 nautical miles west of Cape Agulhas, she received the following weather forecast for the area Cape Point to Gqeberha (Port Elizabeth). As the weather system is moving in the same direction as the ship but at a faster speed, it will catch up to her when she is in the area.

GALE WARNING +++++ GALE WARNING +++++ GALE WARNING

WIND NORTH-WEST TO WEST, FORCE 10 GUSTING TO
80 KNOTS AT TIMES
SEA HEAVY SWELL REACHING 9 METRES AT TIMES
WEATHER HEAVY RAIN
VISIBILITY POOR IN THE RAIN

- 4.1.1 What weather system is causing the conditions described in this forecast? (2)
- 4.1.2 As the ship begins to experience the effects of the storm, what precautionary measure might the Master take to lessen the impact of the storm on the ship? (2)
- 4.1.3 With modern electronic systems for navigation, is the rain likely to affect the ship's passage in any way? Answer YES or NO. (2)
- 4.1.4 This weather system will affect Cape Town harbour operations. List THREE ways that it will influence those harbour operations. (6)
- 4.2 Explain why the exchange of ballast water is an important practice in shipping. (8)
- 4.3 What is the top predator in the marine food chain? (2)
- 4.4 What type of swirling weather system – with very strong wind – causes heavy seas in the Caribbean Sea and US Gulf in the late summer? (2)
- 4.5 Why is plastic such a problem in the sea? (6)

[30]

TOTAL: 300



