NATIONAL SENIOR CERTIFICATE EXAMINATION
MAY 2025

MARITIME ECONOMICS

Time: 3 hours 300 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of 14 pages and an Answer Sheet of 1 page. Please check that your question paper is complete.
2. Answer Question 1 on the Answer Sheet provided and hand it in at the end of the examination. Remember to write your examination number in the space provided.
3. Read the questions carefully before answering.
4. Answer all the questions.
5. Answer the questions in the same order that they appear on the question paper.
6. Show all working where calculations are involved.
7. It is in your own interest to write legibly and to present your work neatly.
8. **Final** answers to calculations on hours and days must be rounded off to the **next** unit.
9. Start each question on a new page.

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QUESTION 1 MULTIPLE-CHOICE QUESTIONS

Answer these questions on the Answer Sheet provided. Place an X in the block on the letter that is the correct answer to the question. **You must answer the questions in the same order in which they appear on this question paper.**

1.1 Countries that currently supply large numbers of seafarers to the global fleet are …

A Brazil, Russia, South Africa, India.
B Panama, Liberia, Marshal Islands, Singapore.
C China, Philippines, Indonesia, Russia.
D Philippines, Panama, China, Liberia. (2)

1.2 How many engineering officers will be allocated for a safe manning of a large modern ro-ro ship?

A One
B Two
C Three
D Four (2)

1.3 A trainee navigation officer onboard ships is known as a …

A Deck Cadet.
B Deck Trainee.
C Engine Cadet.
D Engine Trainee. (2)

1.4 These vessels depended on coal bunkers to make way through the water.

A Ancient motor vessels
B Sailing ships
C Steamships
D Harbour tugs (2)

1.5 From the list of ships' fuels listed below, which one is most dirty?

A HFO
B MDO
C MGO
D LNG (2)

1.6 The country with the most ships on its registry.

A Panama
B Liberia
C Singapore
D South Africa (2)

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1.7 The important detail concerning the ship's registration that will appear on the ship's stern is …

A port of load/discharge.
B ship's name.
C classification society.
D country of registry. (2)

1.8 A country in which a ship has been registered is known as a …

A coastal state.
B flag state.
C country of registration.
D Panama state. (2)

1.9 Some shipowners prefer to register their ships in foreign countries because …

A they want to participate in wars.
B they are born in those countries.
C they want to benefit from better tax systems.
D they want to pay more for crew members. (2)

1.10 An organisation to approve a ship's major structural modifications is a …

A Flag State.
B Society of Master Mariners.
C P&I Club.
D Port State Control. (2)

1.11 The process of settling maritime disputes pertaining to charter rates payable is known as a/an …

A dispute settlement.
B arbitration.
C court order.
D attribution. (2)

1.12 Ship A's hull was badly damaged after a collision. Which insurance will cover the damage of Ship A's hull?

A Ship A's P&I Club
B Ship A's Hull and Machinery
C Ship A's FFO
D Cargo Insurance (2)

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1.13 Ship A, on a coastal passage, collided with a lighthouse. Which insurance will cover the damage to the lighthouse?

A Ship A's P&I Club
B Ship A's Hull and Machinery
C Ship A's FFO
D Cargo Insurance (2)

1.14 Ship A's hull was badly damaged and there was an ingress of water damaging the cargo of wheat in the number one hold. Which insurance will ultimately cover the damage to the cargo?

A Ship A's P&I Club
B Ship A's Hull and Machinery
C Ship A's FFO
D Cargo Insurance (2)

1.15 A nine-holds Capesize bulk carrier is loaded in holds four, five, and six. Which of the following hull stresses will she experience?

A Hogging
B Sagging
C Torsion
D Forward and aft trim (2)

1.16 The world's busiest and largest bunker port is …

A New York.
B Durban.
C Singapore.
D Shanghai. (2)

1.17 A sea area that extends 200 nautical miles from a baseline of a littoral state is known as …

A territorial waters.
B contiguous zone.
C exclusive economic zone.
D continental shelf. (2)

1.18 A maritime convergence zone that is highly important for the Far East's industrialisation is …

A Strait of Dover.
B Strait of Hormuz.
C Strait of Malacca.
D Strait of Gibraltar. (2)

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1.19 Incoterms clearly define the shipping responsibilities and liabilities between the …

A carrier and ship.
B shipper and consignee.
C shipper and carrier.
D shipper, carrier, and consignee. (2)

1.20 An IMO convention that guides the functioning of bills of lading and other sea transport documents is called a …

A bill of lading convention.
B carriage of goods by sea convention.
C sea transport documents convention.
D SOLAS. (2)

1.21 An organisation that is responsible for the national customs control is ...

A South African Revenue Services.
B South African National Ports Authority.
C South African Department of Home Affairs.
D South African Maritime Safety Authority. (2)

1.22 Forming the apex of the aquatic/marine food chain are …

A orcas.
B seals.
C zooplankton.
D phytoplankton. (2)

1.23 Current found off the Southern African west coast is …

A warm Agulhas current.
B warm Benguela current.
C cold Agulhas current.
D cold Benguela current. (2)

1.24 A ship sailing from Brazil to South Africa in winter could encounter a …

A hurricane.
B monsoon.
C mid-latitude cyclone.
D typhoon. (2)

1.25 Sailing from Taiwan to South Korea in July, a ship could encounter …

A willy-willies.
B a hurricane.
C a monsoon.
D a typhoon. (2)

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QUESTION 2 THE MARITIME WORLD

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2.1 2.1.1 Why do drillships require a Dynamic Positioning propulsion system? (2)

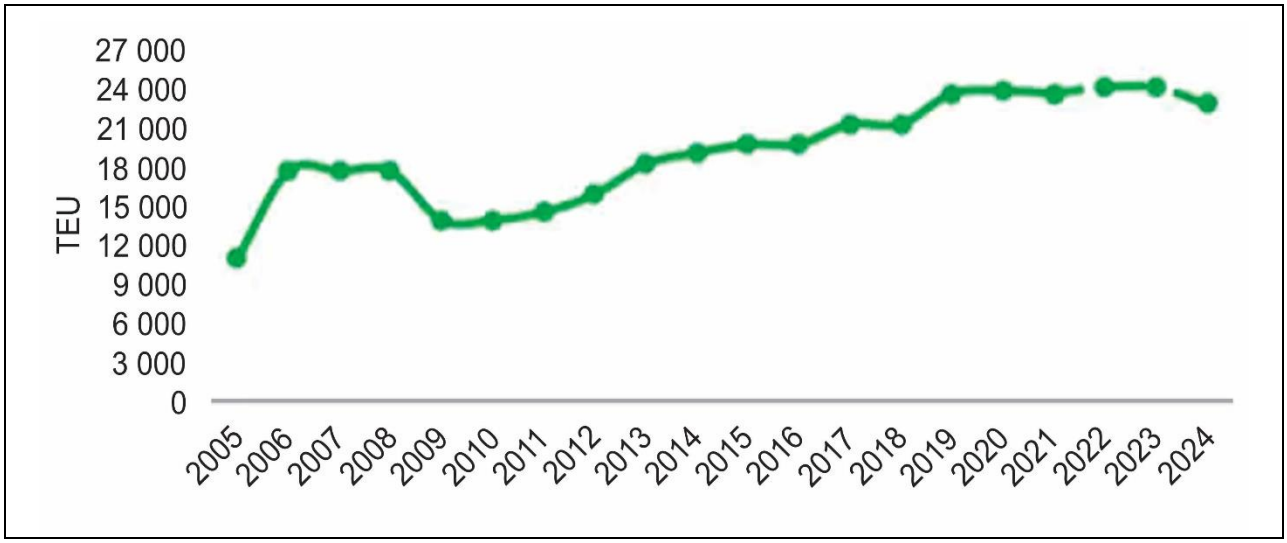
2.1.2 Briefly explain how the change from steam-powered ships to motor vessels affected shipping. (8)

2.1.3 Motorships have a greater sailing range when compared to steamships. What does this mean? (2)

2.1.4 Besides the installation of funnel scrubbers, how else are shipowners trying to reduce greenhouse gas emissions from their ship? (6)

2.2 Study the line graph shown below and answer the questions set.

Figure 1: Maximum Container Ship TEU Capacity by Built Year



[Source: HIS Markit Maritime Portal]

2.2.1 What does TEU stand for? (2)

2.2.2 The maximum capacity of container ships built in 2005 was about 10 000 TEUs. As of 2023, the carrying capacity had doubled to about 24 000 TEUs. Give THREE possible reasons for this massive increase. (6)

2.2.3 How many years' data does the above graph depict? (2)

2.2.4 What was the percentage change in maximum container ship TEU capacity built between the years 2005 (10 000 TEUs) and 2024 (23 000 TEUs)? (6)

2.2.5 What was the 10-year trend in container ship capacity growth from 2010 to 2020? CHOOSE: INCREASE, DECREASE, OR STEADY. (2)

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2.3 In 2023, the Philippine Overseas Employment Administration (POEA) deployed 400,000 seafarers to countries worldwide.

2.3.1 On which continent is the Philippines? (2)

2.3.2 Name FOUR other countries that are major suppliers of seafarers. (4)

2.3.3 According to which IMO convention must these countries train and certify their seafarers? (2)

2.3.4 Mention THREE reasons why countries like the Philippines are now the major suppliers of seafarers, when in the past most seafarers came from western European countries. (6)

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QUESTION 3 SHIPPING OPERATIONS

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The following details refer to the voyage of the container ship *MV Amazing* from Ngqura (Gqeberha) to Vancouver. The vessel has been chartered for a voyage from Ngqura to Vancouver while a regular vessel on the trade is drydocked in Vancouver.

Owners		Canada Containership Investments (CCI), Vancouver, Canada
Port of Registry		Valetta, Malta
Charterer		Pan Asian Container Lines, Hong Kong
Classification Society		Bureau Veritas
Insurance		Thames H&M; North of England P&I Club; FFO
Charter begins		00:01 on 14 May (the day she begins loading in Ngqura)
Charter ends		23:59 on the day she finishes discharging in Vancouver.
Operational costs		$38 000 per day [excluding fuel]
ETD from Ngqura		23:59 on 17 May
Port costs in Ngqura		$26 000 per day
Tugs & Pilotage [Ngqura]		$18 000
Estimated time in Vancouver		See **Operations in Vancouver**
Port costs in Vancouver		$33 000 per day
Tugs & Pilotage in Vancouver		$53 700
Distance: Ngqura-Vancouver		13 340 nautical miles
Operational speed		22 knots
Fuel consumption HFO		56 tons per day at sea
Fuel consumption MDO		03 tons per day in port and at sea
Fuel prices at Ngqura	HVF:	$282 per ton
	MDO:	$336 per ton
Agency costs for the voyage		$69 200
Sundry costs for the voyage		$238 000

Cargo manifest for *MV Amazing* on departure from Ngqura:

ALL CARGO LOADED IN NGQURA

Number	***Description***	***Freight Rate [$]***
230	20-foot dry cargo containers	1 200 each
1496	40-foot dry cargo containers	2 350 each
406	40-foot integrals containers	3 120 each
46	20-foot tank containers	1 400 each
22	40-foot flat-rack containers	2 124 each

3.1 3.1.1 *MV Amazing* was chartered to fill in for a ship currently in dry dock. Give THREE other reasons why companies may choose to charter a ship instead of buying one. (6)

3.1.2 After the charter was fixed, voyage instructions were issued. What are voyage instructions? (6)

3.1.3 Draw a load line as will be visible from *MV Amazing's* starboard side. (8)

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3.1.4 The owners of *MV Amazing* are from Canada but chose to register their ship in Malta.

(a) What is the correct name for this practice? (2)

(b) Give FOUR possible reasons why the owners chose to register her in a country other than their own. (8)

(c) What role will Malta, as the Flag State of the ship play in the lifetime of *MV Amazing*? (6)

3.2 When the charterer gave the specifications of a ship needed for the charter, what minimum TEU capacity would have been necessary to carry these containers? (8)

3.3 Refer to the details given. How many days did *MV Amazing* spend in Ngqura? (4)

3.4 How many days did *MV Amazing* spend at sea en route from Ngqura to Vancouver? Round off to the next day. (6)

3.5 What was the ship's ETA in Vancouver? (4)

3.6 Look at the cargo manifest of containers carried to Vancouver. How many containers were carried? (4)

3.7 Assume that *MV Amazing* discharged all her containers using three shoreside gantry cranes all working at a rate of 32 lifts per hour. Breaks and shift changes took six hours in total.

3.7.1 How many hours did it take to discharge all the containers? (4)

3.7.2 Charter party stipulates a laytime of 30 hours for the discharging of containers in Vancouver.

(a) What is a charter party? (2)

(b) Did the ship take more time to discharge the cargo of containers? Answer Yes or No. (2)

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

(d) Who is liable to pay? Owner or Charterer or Master. (2)

3.7.3 Assume a different scenario, where containers aboard *MV Amazing* were initially discharged using two gantry cranes for the first eight hours. Thereafter, a total of four gantry cranes worked to discharge her cargo. Each crane maintained a working rate of 32 lifts per hour. How many hours did cargo work take in this scenario? (8)

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3.8 Look at the given freight rates for the different types of containers. Why is it most expensive to ship integral containers? (4)

3.9 *MV Amazing sailed from Ngqura for Vancouver and while crossing the Atlantic Ocean north-west of Walvis Bay, she passed through extremely rough seas that caused her to roll badly. At times, her rolling exceeded 25 degrees, and resulted in her losing 22 containers overboard. The ship's railings up forward were damaged by the containers when they went overboard, and a winch and other fittings on the fo'c'sle were also damaged during the storm.*

The master sent a message to the ship's owner outlining the extent of the damage, and the owner requested his agent in Vancouver to arrange for the repairs to the ship.

The coastguard in Walvis Bay issued a Notice to Mariners, warning of the possibility of containers floating in the area. They sent a maritime patrol aircraft to the area to search for the containers and 13 were located. An anchor handling tug anchored off Walvis Bay, Namibia's main harbour, was requested to go to the area to try to recover the containers. The vessel managed to recover five containers but, on orders from Namibia, a coastguard vessel sank the others by gunfire. Those unaccounted for are presumed to have sunk.

On the ship's arrival at Vancouver, surveyors boarded the ship immediately, and once her cargo work had been completed, she shifted to a repair berth where an engineering company repaired the damage at a total cost of $523 000. The port costs while she was being repaired totalled $90 350.

A week later, the fishing trawler Mauritian Flower hit another of the containers, and, although she was damaged, she managed to return to port where repairs and time out of service amounted to $390 650.

3.9.1 How many containers were not accounted for and presumed sunken? (4)

3.9.2 Which two surveyors boarded the *MV Amazing* on arrival Vancouver? (4)

3.9.3 What kind of marine insurance will cover each of the following:

(a) Ship repairs? (2)

(b) Lost containers? (2)

(c) Cargo inside containers? (2)

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QUESTION 4 INTERNATIONAL TRADE

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4.1 Various incoterms were used for the shipment of containers aboard *MV Amazing*. Tank containers were shipped with incoterm Ex-Works (EXW), who paid for the following? Choose from Carrier, Shipper, Agent, Consignee, and Master.

4.1.1 Costs of taking containers to port. (2)

4.1.2 Cargo handling charges in the port of Ngqura. (2)

4.1.3 Freight charges. (2)

4.1.4 Cargo handling charges in Vancouver. (2)

4.2 The shipper and/or consignee for the tank containers arranged Zyl Logistics to take the containers to port on their trucks. They approached CCI to ship the containers from Ngqura to Vancouver port, where True Logistics Partners will dispatch the containers to their final destinations.

4.2.1 From the companies contracted above, which company issued a bill of lading for the tank containers? (2)

4.2.2 What type of bill of lading was issued? (2)

4.2.3 Give TWO functions of a bill of lading. (4)

4.2.4 Refer to freight rates given in Question 3. What was the total freight paid for the tank containers? (4)

4.3 Regardless of your answers to voyage questions in Question 3, assume that *MV Amazing*'s voyage totalled 32 days. 26 days at sea, 4 days in Ngqura and 2 days in Vancouver.

4.3.1 Calculate the total operational costs for this voyage. (4)

4.3.2 Calculate the total port costs, including tugs and pilotage. (6)

4.3.3 Calculate the total fuel costs. (6)

4.3.4 Calculate the total costs for the voyage. (4)

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4.4 The following is the sailing schedule for CCI's service between west North America and South Africa:

		CCI Prince	*CCI Transporter*	*CCI Peace*	*CCI Progress*
Cape Town	***ETA***	***04/05***	***08/05***	***12/05***	***16/05***
	ETD	***05/05***	***09/05***	***13/05***	***17/05***
Ngqura	***ETA***	***06/05***	***10/05***	***14/05***	***18/05***
	ETD	***10/05***	***14/05***	***18/05***	***20/05***
Vancouver	***ETA***	***05/06***	***09/06***	***13/06***	***17/06***
	ETD	***07/06***	***11/06***	***15/06***	***19/06***
Prince Rupert	***ETA***	***10/16***	***14/06***	***18/06***	***22/06***
	ETD	***11/06***	***15/06***	***19/06***	***23/06***
Vancouver	***ETA***	***14/06***	***18/06***	***22/06***	***26/06***
	ETD	***16/06***	***20/06***	***24/06***	***28/06***
San Fransisco	***ETA***	***18/06***	***22/06***	***26/06***	***30/06***
	ETD	***19/06***	***23/06***	***27/06***	***01/07***
Cape Town	***ETA***	***10/07***	***14/07***	***18/07***	***22/07***
	ETD	***11/07***	***15/07***	***19/07***	***23/07***

4.4.1 What do we call a service like this one operating on a fixed schedule? (2)

4.4.2 KelSweet Interiors Pty in San Fransisco ordered decoration items from South Africa. It was agreed that the shipment would be done in containers via the port of Ngqura, and that the consignment must arrive in San Fransisco by the close of business, on the 28th of June.

(a) What is the name of the latest ship on which this consignment must be shipped? (4)

(b) Assume that containers must arrive in Ngqura Port two days before the ship arrives. By when should the containers have been delivered to port? (2)

(c) Why must the containers arrive in port two days before the ship arrives? (2)

(d) What is the name of the organisation that will clear the containers out of the country in Ngqura? (2)

(e) How many days is the voyage from Ngqura to San Fransisco? (4)

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4.5 The Straits of Hormuz lie at the entrance to the Arabian Gulf (formerly known as the Persian Gulf). Through these straits moves a large percentage of the world's crude oil and oil products en route to China, Japan, Europe, North America and numerous other places, including South Africa. Iran lies to the north of these straits, which are about 60 nautical miles wide in parts.

During the so-called 'Tanker War', when Iran and Iraq were at war with each other in the 1980s, many tankers were attacked by both sides. Iran threatened to close the straits which would have had a serious impact on the trade of other nations that border on the Arabian Gulf, particularly as they have to import most of their consumer goods.

4.5.1 Give TWO reasons for the Strait of Hormuz being so important to the world at large. (4)

4.5.2 Besides tankers, give TWO other types of ship that pass through the Straits of Hormuz daily? (Remember that the area surrounding the Gulf is desert and large volumes of food and 'consumer goods' must be imported.) (4)

4.5.3 The attacks on the Red Sea have made it dangerous for tankers en route from the Arabian Gulf to Europe to use the short route via the Suez Canal.

(a) What is the alternate route for these tankers to Europe? (2)

(b) Mention TWO consequences of tankers using the alternative route. (4)

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QUESTION 5 MARINE ENVIRONMENTAL CHALLENGES

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5.1 During *MV Amazing*'s passage from Cape Town to Ngqura when off Cape Agulhas, she received the following weather forecast for ships valid for the next 12 hours.

Wind	**Gale Warning: SW 35 knots, gusting 50 knots at times**
Swell	**Heavy from the southwest 6 to 8 metres in the south**
Weather	**Cloudy with rain**
Visibility	**Poor in the rain**

5.1.1 What is the type of weather system that is likely to be approaching the containership in her present position? (2)

5.1.2 Give TWO effects of the expected weather on her passage. (4)

5.1.3 Is the ship's ETA at Cape Town likely to change? (2)

5.1.4 Give TWO possible effects of the weather on shipping and port operations in Port of Ngqura over the next 24 hours. (4)

5.2 Explain why oil pollution and any other form of pollution at sea is such an unwanted act. (8)

5.3 Besides pollution, what other acts disrupt the marine ecosystem? (6)

5.4 South Africa is responsible for safety of its demarcated sea area as per UNCLOS. This includes its territorial waters and Economic Exclusive Zone.

Why is the Exclusive Economic Zone important to South Africa? (4)
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Total: 300 marks

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