



NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2018

MARITIME ECONOMICS

Time: 3 hours

300 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of 15 pages, an Answer Sheet of 1 page (i) and an Addendum of 1 page (i). Please check that your question paper is complete.
 2. Please write your examination number in the blocks provided on the Answer Sheet. Remember to hand in this sheet.
 3. Answer all the questions.
 4. Read the questions carefully before answering.
 5. It is in your own interest to write legibly and to present your work neatly.
 6. When doing calculations, all working detail must be shown.
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QUESTION 1 MULTIPLE-CHOICE QUESTIONS

Answer these questions on the Answer Sheet provided. Place an X in the block next to the letter that is the answer to the question, or is the term described. YOU MUST ANSWER THE QUESTIONS IN THE SAME ORDER IN WHICH THEY APPEAR ON THIS QUESTION PAPER.

- 1.1 Shipowners are being forced to ensure that the following devices are fitted to their ships' exhaust flues:
- A exhaust brooms
 - B exhaust scrubbers
 - C exhaust trimmers
 - D exhaust refiners
- 1.2 How many engineering officers are usually assigned to a large tanker with an engine of about 45 000 break horsepower?
- A two
 - B three
 - C four
 - D five
- 1.3 The country providing most of the world's merchant seafarers is ...
- A Liberia
 - B China
 - C Norway
 - D Philippines
- 1.4 A ship is registered in Singapore but is owned by a British company. The term for this practice is ...
- A cross-registering
 - B trans-registering
 - C flagging away
 - D flagging out
- 1.5 The organisation that will declare a ship seaworthy after an accident is ...
- A Classification Society
 - B Shipping Society
 - C Lloyd's Association
 - D Lloyd's Convention
- 1.6 A handysize bulk carrier sails from Newcastle (south-east coast of Australia) to Shanghai (China). Through which of the following seas or oceans will she pass?
- A Indian Ocean
 - B Pacific Ocean
 - C Arabian Sea
 - D South China Sea

- 1.7 What type of insurance would cover damage to a buoy that was hit by a ship?
- A TT Club
 - B FFO
 - C P&I Club
 - D Hull & Machinery
- 1.8 What type of insurance would cover damage to a ship resulting from a severe storm?
- A TT Club
 - B FFO
 - C P&I Club
 - D Hull & Machinery
- 1.9 What type of insurance would cover a ship needing to divert to land an injured crewmember?
- A TT Club
 - B FFO
 - C P&I Club
 - D Hull & Machinery
- 1.10 What type of insurance would cover injury to a stevedore when cargo fell following the breaking of the cable on a ship's crane?
- A TT Club
 - B FFO
 - C P&I Club
 - D Hull & Machinery
- 1.11 The term that applies to the process of settling a dispute between a salvage tug owner and a shipowner whose ship was the subject of a salvage claim is known as ...
- A resolution
 - B salvage review
 - C legal opinion
 - D arbitration
- 1.12 A severe revolving storm encountered off the coast of Florida (USA) where wind speeds reached 195 kmph is known as a ...
- A hurricane
 - B typhoon
 - C mid-latitude cyclone
 - D monsoon

- 1.13 Between the Gulf of Aden and the Red Sea lies ...
- A Strait of Hormuz
 - B Strait of Malacca
 - C Bab-el-Mandeb
 - D Torres Straits
- 1.14 The Incoterm that indicates that the costs of carrying the cargo (from before it crosses over the ship's gunwale) until it reaches the consignee's premises will be paid by the consignee.
- A FOB
 - B FAS
 - C CIF
 - D DDP
- 1.15 The Incoterm that indicates that the costs of shipping cargo from the shipper's premises to the consignee's premises will be paid by the consignor.
- A FOB
 - B FAS
 - C EXW
 - D DDP
- 1.16 Who bears the shipping freight charges on the ocean leg of the transport chain if cargo is shipped DDP (Delivered Duty Paid)?
- A the shipper
 - B the consignee
 - C the carrier
 - D the forwarding agent
- 1.17 The document that sets out the conditions of the carriage of goods by sea is called the ...
- A charter party
 - B bill of lading
 - C cargo manifest
 - D mate's receipt
- 1.18 A passenger is injured aboard a cruise ship. Who pays the medical bills when he is treated in hospital?
- A the cruise ship owner
 - B the travel agent who booked his passage aboard the ship
 - C the ship's P&I Club
 - D the Classification Society

1.19 The primary cause of rough seas off the south-western coast of southern Africa in winter is ...

- A mid-latitude cyclone
- B tropical cyclone
- C shape of the coastline
- D north-east monsoon

1.20 The apex predator in the marine food chain is ...

- A blue whale
- B great white shark
- C leopard seal
- D orca

1.21 The term for an area where the river widens near its mouth is ...

- A riviera
- B atoll
- C estuary
- D bay

1.22 An international code in terms of which ships must have regular fire drills aboard is

- A SOLAS
- B STCW 95/2010
- C ISM
- D ISPS

1.23 The distance that a ship can steam without refuelling is called the ...

- A fuel capacity
- B fuel consumption
- C range
- D log

1.24 A vessel that carries liquefied natural gas is called a ...

- A LNG FPSO
- B LNG bulker
- C LNG carrier
- D LNG terminal

1.25 The country in which a ship is flagged is known as the ...

- A port state
- B flag state
- C ship state
- D ship register

1.26 The African country with the largest ships' register is ...

- A South Africa
- B Nigeria
- C Egypt
- D Liberia

1.27 If a country has a system of cabotage, it means that the country ...

- A allows ships of any nationality to move cargoes between its ports.
- B allows only foreign ships to move its export cargoes to foreign ports.
- C allows only foreign ships to move cargoes between its ports.
- D allows only ships registered in its ports to move cargoes between its ports.

1.28 A ship steaming from Cape Town to Walvis Bay (Namibia) will ...

- A steam against the Benguela Current.
- B steam against the Agulhas Current.
- C steam with the Agulhas Current.
- D steam with the Benguela Current.

1.29 Conditions associated with a monsoon may affect shipping in the ...

- A Arabian Sea
- B Caribbean Sea
- C Tasman Sea
- D Baltic Sea

1.30 Conditions associated with a typhoon may affect shipping near ...

- A Lagos (Nigeria)
- B Rio de Janeiro (Brazil)
- C Manila (Philippines)
- D Fremantle (Australia)

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QUESTION 2 THE MARITIME WORLD

- 2.1 Study the graph of coal exports from Port X, given as **Addendum 1** to this question paper. Note that the figures for Years 2018 to 2021 are estimates only. Now answer the questions set.
- 2.1.1 What was the greatest tonnage of coal exported in a single year via Port X? (2)
- 2.1.2 In which year was the greatest tonnage of coal exported via Port X? (2)
- 2.1.3 The graph shows a steady decline in coal exports through Port X.
- (a) In terms of global energy trends, suggest two reasons for this decline in coal exports. (4)
- (b) How will the decline in coal exports affect Port X? (8)
- 2.1.4 Look at the tonnage of coal exported in 2015.
- (a) If the average cargo capacity of bulk carriers moving that coal was 150 000 tons, how many bulk carriers would have called at Port X in that year to load coal? (4)
- (b) How many bulk carriers would have arrived each week to load coal at Port X in 2015? (4)
- (c) From the figures below, choose the approximate deadweight of a bulk carrier that can carry 150 000 tons of cargo when fully loaded.
- 190 000 dwt; 180 000 dwt; 170 000 dwt; 160 000 dwt;
150 000 dwt (2)
- 2.2 A large modern bulk carrier capable of carrying 150 000 tons of cargo has a powerful main engine.
- 2.2.1 What type of fuel does her main engine use? (2)
- 2.2.2 On a large bulk carrier, what are generators used for? (2)
- 2.2.3 The type of propulsion used in a modern bulk carrier does not cause as much air pollution as the propulsion system in a coal-fired steam ship of similar power in 1920. Give four other advantages of the type of propulsion used in a modern bulk carrier. (8)
- 2.2.4 Give two ways in which shipowners are trying to reduce air pollution from a ship's exhaust gases. (4)

- 2.3 Read the following comment that was made after President Cyril Ramaphosa had delivered his first speech to the South African parliament earlier this year. Then answer the question set.

The president's positive stance on many issues is good news for the shipping industry that is calling for favourable economic conditions in which it can operate and grow. This is especially important because around 93 per cent of South African trade is carried by ships, presenting opportunities for local shipowning and chartering with local companies providing brokerage work, insurance and other services for South African ships.

– Cape Times 21 February 2018

Explain why the South African shipping industry needs favourable economic conditions (in South Africa) in which it can operate and grow.

(8)
[50]

QUESTION 3 SHIPPING OPERATIONS

3.1 Here are some details about the bulk carrier *Penguin*.

Length		223 metres
Loaded Draught		14 metres
Freeboard when loaded		5 metres
Owner		Penguin Shipping, Hong Kong
Port of Registry		Hong Kong
Origin of the Cargo		Oz Coal Exporting Company, Newcastle
Charterer		Yangtze Coal Company, Shanghai, China (The company has bought the consignment of coal that will be delivered over 12 months by <i>Penguin</i> .) She is on a time charter for 12 months.
Insurers	H&M	HK Insurers, Hong Kong
	P&I	North of England P&I Club
Deadweight		84 300 dwt
Usual cargo distribution during her charter voyages		
		No 1 Hold 7 500 tons
		No 2 Hold 10 500 tons
		No 3 Hold 11 500 tons
		No 4 Hold 13 000 tons
		No 5 Hold 12 500 tons
		No 6 Hold 12 500 tons
		No 7 Hold 12 500 tons

3.1.1 Refer to the ship's details given above. What type of bulk carrier is *Penguin*? (2)

3.1.2 She will move coal from Newcastle (Australia) to Shanghai (China).

- It is expected that she will carry about 80 000 tons of coal per voyage.
- Loading in Newcastle will be done by two shiploaders at a rate of 2 000 tons an hour **each**.
- Loading on her first voyage from Newcastle is scheduled to begin at 08:00 on 4 December.
- Breaks (tea breaks, change of shift, etc.) will total four hours for the duration of the loading process.
- Before she can sail, various clearance procedures and other procedures will take four hours **once cargo work has been completed**.

(a) How many hours will it take to complete the loading of the cargo, **including breaks**? If necessary, round off to the NEXT hour, e.g. 16,3 becomes 17 hours. (6)

(b) When will the loading of the cargo be finished? (6)

- (c) When will she sail from Newcastle? (4)
- (d) Name three of the procedures that have to be completed before the ship can sail. (6)
- 3.1.3 Refer to your answer to Question 3.1.2 (a). The charter party required that cargo loading should be completed in 38 hours.
- (a) Did she take a longer or a shorter period of time to load this cargo? Choose your answer from LONGER or SHORTER or THE SAME. (2)
- (b) Will demurrage or dispatch be payable in this case? (2)
- 3.1.4 In his calculations prior to the charter, *Penguin's* owner worked on the following information for the voyages to move the coal from Newcastle to Shanghai and return to Newcastle:
- A round voyage begins on the ship's arrival in Newcastle and ends on the ship's arrival back in Newcastle.
 - Time allowed for stay in Newcastle on each voyage: 3 days.
 - Time allowed for anchoring during one round voyage: 5 days.
 - Time allowed for voyage from Newcastle to Shanghai: 14 days.
 - Time allowed for discharging in Shanghai: 7 days.
- (a) Draw a sketch to show one round voyage of *Penguin* from arrival at Newcastle, her voyage to Shanghai, her stay in Shanghai, and her return voyage to Newcastle. Indicate the number of days spent on each part of the voyage. (8)
- (b) How many days will **one round voyage** take? (6)
- (c) How many round voyages will she be able to **complete** during the year that she is on time charter? (6)
- (d) Assuming she carries a similar amount of coal per voyage, how much coal will she have carried during all those completed round voyages? (6)
- 3.1.5 The contract to carry the coal indicates that it will be carried CIF, the INCOTERM for *Cost of Insurance and Freight*.
- Choosing your answers from CONSIGNOR (SHIPPER) or CONSIGNEE or CARRIER, who pays for each of the following costs?**
- (a) The shipping costs from Newcastle to Shanghai. (2)
- (b) Insurance on the coal cargo. (2)

3.2 During a voyage from Newcastle to Shanghai, a fire breaks out in the coal cargo in number 3 hold. Carbon dioxide is released into the hold, but the fire is not extinguished and increases in intensity. The master decides to flood the hold with seawater, but realises that the heat from the fire has been so intense that the coal in number 4 hold has also caught fire. He also floods number 4 hold with seawater. He turns the ship to return to Newcastle (672 nautical miles away) and transmits an "all ships" radio call. The containership *Australian Hawk* and the salvage tug *Kangaroo* respond.

Three hours later, *Australian Hawk* arrives abeam of *Penguin*, and *Kangaroo* arrives later in the day. The fire is extinguished by *Penguin's* crew and the flooding of the two holds. *Australian Hawk* continues her voyage and *Kangaroo* accompanies *Penguin* back to Newcastle where surveyors board the ship before she enters the port. After a formal inspection of the damage she is allowed into port where the partly burnt coal in numbers 3 and 4 holds is discharged. It is discovered that the ship has suffered fire damage to plating and to some of her frames, which need to be repaired. The rest of her cargo is also discharged and she sails for Sydney where the nearest available dry-dock is situated.

Three weeks later, she returns to Newcastle to load a new cargo for Shanghai and to resume her charter.

- 3.2.1 Look at the details of the ship and the cargo distribution as given in Question 3.1. Draw a general arrangement plan of the ship (**as viewed from the port side**) and indicate the following on the plan: the holds where the fire was located; her actual draught; her actual freeboard; her actual length; her bow; her stern; her funnel; her accommodation; her main mast. (12)
- 3.2.2 Can the tug claim salvage associated with this incident? Answer YES or NO. (2)
- 3.2.3 Give two reasons for your answer to Question 3.2.2. (4)
- 3.2.4 When she arrived at Newcastle, surveyors representing three organisations were waiting to assess the damage to the ship and the cargo. Which organisations do they represent? (6)
- 3.2.5 What is the term that will apply to a ship that cannot fulfil the requirements of the charter party, as happened in this case? (The ship is) (2)
- 3.2.6 What type of insurance will cover each of the following?
- (a) The loss of some of the coal cargo. (Remember that the fire began aboard the ship.) (2)
- (b) The fact that the ship was out of service for more than three weeks. (2)

- 3.2.7 In some instances, *General average* can be declared after an accident or damage to a ship. Who declares *General average* when the ship is operating on a liner service? Choose your answer from: SHIP'S MASTER or SHIPOWNER or CHARTERER or SHIPPER. (2)
- 3.2.8 You are a maritime journalist. Write a short article (about 50 words) on the fire aboard *Penguin*. Be sure to include quotes from the master of the ship and from the port captain of Newcastle harbour that tell the reader something about the fire on board. (10)
[100]

QUESTION 4 INTERNATIONAL TRADE

- 4.1 How many *bills of lading* are required for the cargo of coal being carried by *Penguin*? Choose your answer from: ONE PER VOYAGE or ONE PER HOLD or ONE PER TON or ONE FOR THE ENTIRE SHIPMENT OVER THE YEAR. (2)
- 4.2 Refer to the details of the ship as provided in Question 3.1. In the case of the coal cargoes being moved from Newcastle to China, what is the name of ...
- (a) the consignor (shipper)? (2)
- (b) the consignee? (2)
- 4.3 Look at your answers to Questions 3.1.4 (c) and 3.1.4 (d).
- 4.3.1 If a Capesize bulk carrier with a cargo capacity of 160 000 tons of coal had to be used instead of *Penguin* for this charter, how many round voyages would she have had to make to carry the same **total** amount of cargo? (6)
- 4.3.2 What might have been the possible advantages to the charterer if a Capesize vessel had been used? (4)
- 4.3.3 Despite the possible advantages to the charterer of using a Capesize ship, give two possible reasons why the charterer chose a ship like *Penguin* to move the coal from Newcastle to China, rather than a Capesize vessel. (4)
- 4.4 The government of Country X wants to stimulate the shipbuilding industry because it is labour intensive (i.e. it provides jobs for lots of people). However, a shipyard was established in Port A, but it is struggling to compete with foreign shipyards that are able to build ships more cheaply than the shipyard at Port A. One of the main reasons that the shipyard in Port A is struggling is because it needs to import vital parts (e.g. engines, generators and major electronic equipment) for the ships it builds. In addition, customs duty on these imports is very high.
- 4.4.1 Explain what Country X should do to ensure that the shipbuilding industry can grow in size and in profitability. (6)
- 4.4.2 Apart from providing jobs, explain why a shipbuilding industry will be important for Port A and Country X as a whole. (8)
- 4.4.3 What type of ship will be used to bring clothing from China to Port A? (2)

- 4.5 The Strait of Hormuz is a very important convergence zone in world shipping.
- 4.5.1 Describe the position of this convergence zone. (4)
- 4.5.2 Explain its **economic** importance in terms of world trade. In your answer include reference to important cargoes that pass through the strait. (10)
- 4.6 Explain why maritime law needs to be similar in all countries. (6)
- 4.7 Name the organisation that ...
- 4.7.1 is the international controlling body for shipping. (2)
- 4.7.2 would act against a ship that has stopped five miles south of Cape Agulhas without informing the authorities. (2)
- 4.8 Look at your answer to Question 4.7.2. What action would that organisation take against the ship described in that question? (4)
- 4.9 Marine pollution gains international attention, especially in cases of oil pollution or plastic (in its many forms) being found in the sea. Much of the plastic is washed into the sea from rivers.
- 4.9.1 What is the actual source of much of the plastic found in the sea? (2)
- 4.9.2 What are some of the results of plastic pollution in the sea? (4)
- [70]**

QUESTION 5 MARINE ENVIRONMENTAL CHALLENGES

5.1 The following is the shipping weather forecast for the area around Port Elizabeth, i.e. for the period 00:01 to 12:00 on 24 November.

WIND SPEED	28 KNOTS, GUSTING 35 KNOTS AT TIMES STRENGTHENING LATER
WIND DIRECTION	SOUTH-EASTERLY
WEATHER	CLEAR
SEA STATE	SWELL 2 METRES, BECOMING 3 METRES LATER
VISIBILITY	MODERATE

How will the weather during the forecast period affect each of the following operations in Port Elizabeth harbour?

- 5.1.1 Container operations. (4)
- 5.1.2 Loading vehicles onto a car carrier. (4)
- 5.1.3 The sailing of a full containership that is 300 metres long. (4)
- 5.2 Explain why fishing quotas are applied to companies engaged in fishing in South African waters. (8)

[20]

Total: 300 marks