NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2010

MARITIME ECONOMICS

Time: 3 hours 300 marks

PLEASE READ THESE INSTRUCTIONS CAREFULLY

1. This paper consists of 11 pages and an Addendum of 3 (i to iii pages). Please check that your paper is complete.
2. Answer all questions.
3. Read the questions carefully.
4. It is in your interests to write legibly and to present your work neatly.
5. Show all working where calculations are involved.

QUESTION 1 THE MARITIME WORLD

1.1 No commercial ships operate with coal-fired boilers. Give two reasons for this. (4)

1.2 What type of engine does a large, modern containership have? (2)

1.3 Some shipowners are exploring several more eco-friendly ways to power their ships.

1.3.1 Why are they doing this? (2)

1.3.2 Give two examples of these 'more eco-friendly ways' to power their ships. (4)

1.4 Study the graphs from *Marine Transport Weekly* provided as Addendum One and answer the questions below.

NOTE:

- A **Spot Rate** is a charter rate for a particular type of ship, and the word **current**, means the **present charter rate**. For example: Figure 24 shows the spot charter rates for VLCCs from 2003 to the present time.
- The rates shown are in US$ per day.
- A **Suezmax** tanker is a tanker that can pass through the Suez Canal fully laden.
- An **Aframax** tanker is a tanker of about 75 000 to 100 000 deadweight.
- A **Panamax** tanker is a tanker that can pass through the Panama Canal fully laden.
- An **LR Product** tanker is a tanker of about 50 000 deadweight that carries petroleum products.
- An **MR Product** tanker is a tanker of about 30 000 to 40 000 deadweight that carries petroleum products.
- Assume the year **begins** at the line, e.g. 2007 stretches from the line marked 2007 to the line marked 2008.

1.4.1 In which year was the rate for VLCCs the highest? (2)

1.4.2 What is a VLCC? (2)

1.4.3 If you had a cargo of 120 000 tons of crude oil to move from Kuwait in the Arabian Gulf to Europe, which type of tanker would you use? (2)

1.4.4 Give a reason for your answer to Question 1.4.3. (2)

1.4.5 Which route would a tanker use to move a cargo of 37 000 tons of petrol from Curacao (in the Caribbean Sea) to Chile (on the west coast of South America)? (2)

1.4.6 How many of the graphs show that the spot rate now is higher than the spot rate in 2003? (2)

1.4.7 All of the graphs show a relatively high rate around the end of each year, and in some cases, into the early part of the next year. Explain this trend. (8)

1.5 Read the extract from *Marine Transport Weekly* provided as Addendum Two and answer the questions below.

NOTE:

AG/East means the route from the Arabian Gulf to the East.
30k b/d means 30 thousand barrels of oil a day.
y/y means year on year.
Frontline is a large tanker operator.

1.5.1 Look at the first paragraph. In the context of this extract, what does the term **fixture** mean? (4)

1.5.2 Look at the first paragraph. Have any of the tanker rates dropped recently? Answer either YES or NO, *and explain your answer*. (8)

1.5.3 Look at the second paragraph. What three developments indicate that the demand for oil is increasing? (6)

1.5.4 Look at the third paragraph. How many tankers has Frontline bought? (2)

1.5.5 If you had to draw the graph for spot rates for VLCCs from now until the end of the year, would your graph go upwards or downwards? (2)

1.5.6 What aspect of Frontline's recent activities would support your answer to Question 1.5.5? (2)

1.6 What role does the term STCW 95 Convention play in shipping? (4)

[60]

QUESTION 2 SHIPPING OPERATIONS

Here are some details about the containership *Clermont*.

Owners	Island Shipping, Bahamas	
Charterers	Eezee Container Lines, Hamburg, Germany **(On time charter at $34 000 per day.)**	
Managers	Nordzee Ship Managers, Bremerhaven, Germany	
Port of Registry	Freeport, Bahamas	
Classification	Lloyd's Register *100 A1* LMC	
Year built	2009	
Insurance	Hull & Machinery: Lloyds Covered by Northern P&I Club	
Dimensions of the ship	Length overall	252 metres
	Beam	32 metres
	Draught (fully laden)	12 metres
Cargo Capacity	4 800 teu (including 800 40-foot reefer slots)	
Usual Schedule	Hamburg (Germany)-Rotterdam (Netherlands)-Cape Town-Port Elizabeth-Durban-Cape Town-Las Palmas (on Grand Canaria Island off the bulge of Africa)-Felixstowe (UK)-Hamburg	

2.1 Has this ship been flagged out? Answer YES or NO. (2)

2.2 Give a reason for your answer to Question 2.1. (2)

2.3 This ship is classed by Lloyd's Register. Describe the role of Lloyd's Register for this ship. (10)

2.4 When *Clermont* arrived in Cape Town, a surveyor boarded to do a Port State Control inspection.

2.4.1 From which state organisation would he have come to do that inspection? (2)

2.4.2 List two reasons he might have for boarding the ship. (4)

2.5 Which country would undertake a Flag State inspection of the ship? (2)

2.6 Give two functions of the Flag State in respect of this ship. (4)

2.7 Assume this ship would discharge and load the following cargo as shown in the table below.
The Port Rotation is shown at the top of the table.
Assume that all containers to be loaded during her first call at Cape Town will be destined **for** Durban.
Assume that all containers to be loaded in Port Elizabeth, Durban and Cape Town (northbound call) are destined for European ports.

GP	=	General Purpose Dry Cargo Container
DG	=	Dangerous Goods (e.g. flammable cargo; toxic cargo; acids)
DIS	=	Containers to be Discharged
LOAD	=	Containers to be Loaded
CAPE TOWN N/B	=	Cape Town Northbound Call. This means that the ship will also call at Cape Town on her way back to Europe. On that call, she will discharge some containers **from** Durban and load containers **for** Europe.

	CAPE TOWN		PORT ELIZ.		DURBAN		CAPE TOWN (N/B)	
	DIS	*LOAD*	DIS	*LOAD*	DIS	*LOAD*	DIS	*LOAD*
40' GP FULL	220	*005*	121	*134*	634	*525*	009	*046*
40' GP DG	010	*000*	007	*000*	027	*016*	018	*000*
40' GP EMPTY	101	*000*	063	*024*	145	*223*	058	*145*
20' GP FULL	025	*000*	012	*000*	087	*054*	011	*012*
20' GP EMPTY	000	*000*	002	*000*	016	*024*	000	*042*
40' REEFER FULL	008	*112*	001	*132*	017	*122*	000	*401*
40' REEFER EMPTY	488	*000*	188	*000*	201	*000*	011	*000*
20' TANK FULL	021	*034*	009	*000*	029	*029*	000	*034*
20' TANK DG	012	*000*	004	*000*	052	*004*	021	*002*
20' TANK EMPTY	000	*000*	000	*000*	008	*000*	027	*000*
40' FLAT RACK FULL	023	*000*	006	*000*	015	*000*	000	*000*
40' FLAT RACK EMPTY	000	*000*	000	*005*	000	*012*	000	*024*
	908	***151***	**413**	***295***	**1231**	***1009***	**155**	***706***

Now answer the questions set.

2.7.1 What evidence in the table shows that the fruit farmers in the Western Cape ship fruit to Durban? (2)

2.7.2 Bearing in mind that the Western Cape produces a range of fruit and has a large fishing industry, what products are likely to be in the tank containers shipped from Cape Town to Durban? (4)

2.7.3 Large car assembly factories are in the Port Elizabeth/Uitenhage area. Bearing in mind that this ship has loaded in a German port, name two products that are likely to be in the containers discharged at Port Elizabeth. (4)

2.7.4 Give an example of the cargo that might be loaded on the flatrack containers that were landed in Cape Town. (2)

2.7.5 In Port Elizabeth, two gantry cranes will be available for *Clermont* when she works cargo. Each gantry can handle 16 containers per hour, and breaks will total 2 hours. She will sail one hour after she has finished cargowork.

(a) How many hours will it take to handle all the containers in Port Elizabeth, including breaks? (4)

(b) If she starts cargowork at 08:00 on 4 December, what is her expected time of departure from Port Elizabeth? (4)

2.7.6 How many **TEU** (NOT containers) is she scheduled to load **for Europe** in South African ports? Show your calculations. (4)

2.7.7 When this ship sails from Cape Town for Europe, will she be loaded to capacity? Answer YES or NO. (2)

2.7.8 Explain your answer to Question 2.7.7. (4)

2.7.9 Will she have space for 45 reefer containers that she is scheduled to load in Las Palmas? Answer YES or NO, *but show your calculations to support your answer*. (6)

2.7.10 Where would the containers marked DG be stowed on the ship? (2)

2.7.11 Explain the difference if cargo in one container is shipped FOB (free on board) and cargo in another container is shipped EXW (ex works). (6)

2.8 *Clermont* is scheduled to leave Cape Town for Las Palmas on 10 December and take 9 days to steam from Cape Town to Las Palmas, to spend 1 day in Las Palmas loading reefer containers of fruit for Europe, and to take 3 days to steam from Las Palmas to Felixstowe. Her usual fuel consumption is 83 tons of HVF per day at sea, the price in Cape Town is $290 per ton and her consumption of MDO is 3 tons ($396 per ton) per day at sea and in port.

However, she is delayed for two days by wind in Cape Town, and to ensure that *Clermont* arrives **in Felixstowe** on time, she will have to increase speed and, while her MDO consumption will be unaffected, she will use 132 tons of HVF per day. She will now be at sea for the following times:

Cape Town to Las Palmas = 7.5 days
Las Palmas to Felixstowe = 2.5 days

2.8.1 Using the daily charter rate provided, what is the charter cost for a usual voyage from Cape Town to Felixstowe via Las Palmas? (4)

2.8.2 What is the fuel cost for a usual voyage from Cape Town to Felixstowe via Las Palmas? (4)

2.8.3 Showing your calculations to support your answer, will the accelerated voyage after the delay cost more or less than a usual voyage from the time she left Cape Town for Felixstowe via Las Palmas? (Do NOT include the extra two days in Cape Town.) (6)

2.8.4 Will demurrage or dispatch be applicable in the case of a delay caused by wind? (Think carefully!) (2)

2.8.5 Give a reason for your answer to Question 2.8.4. (2)

2.9 As *Clermont* approaches Felixstowe at 06:00, she hits a buoy that sinks ten minutes later, and the ship sustains minor damage to the starboard bow, although, after a survey, she is declared seaworthy. Repairs will be done when the ship arrives in Hamburg.

2.9.1 What type of marine insurance covers the loss of a buoy? (2)

2.9.2 What type of marine insurance covers the damage to the ship? (2)

2.9.3 Which two organisations will need to inspect the ship before she sails from Las Palmas to ensure that she is seaworthy? (4)

2.9.4 You are the Second Mate aboard *Clermont* and you were on the fo'c's'le with the fo'c's'le party who were preparing the mooring lines for berthing, when the ship hit the buoy. Via your radio, you had informed the bridge that the ship was heading for the buoy, and although the master reacted quickly and tried to swing the bow away from the buoy using the bow thrusters, the ship hit the buoy. You also noticed that the buoy seemed to be drifting, instead of being anchored. Compile a report of about 75 words describing what happened from the time you sighted the buoy until the ship berthed in Las Palmas. Refer also to any other facts you consider important. (12)

2.10 Describe the procedures involved in moving a refrigerated container (also known as a reefer container or an integral container) from a fruit packing shed in Ceres (Western Cape) to the warehouse of Super Supermarket, 10 kilometres from Felixstowe (UK). Remember to refer to the various checks that are made along the way, the bill of lading, and other documentation required. (12)

[120]

QUESTION 3 INTERNATIONAL TRADE

3.1 Assume that Country X produces clothing far more cheaply than Country Y. A jacket, produced in Country X, costs R300 in Country Y, including the costs of shipping the jacket from X to Y. The cheapest similar jacket – made in Country Y – costs R350.

3.1.1 How will this affect the clothing industry in Country Y? (6)

3.1.2 How can Country Y reduce the amount of clothing imported from Country X? (4)

3.2 Look at the service on which the containership *Clermont* trades (See Question 2). Name two zones of convergence through which the ship will pass during her voyages between South Africa and Europe. (4)

3.3 Assume that because of serious turbulence in the Middle East, the route via the Suez Canal becomes uncertain for shipping and, on 26 October, international shipping agencies advise owners to divert their ships to the route via the Cape.
Assume that, on 24 October, the bulker *Indian Mariner* had sailed from Mumbai (India) to Rotterdam via the Suez Canal. She would have taken 17 days to reach Rotterdam and would have consumed 45 tons of heavy fuel a day and 2 tons of marine diesel oil a day. Because the bunker price in Rotterdam was lower than in Mumbai, she had taken sufficient bunkers in Mumbai to reach Rotterdam, with a small amount of extra fuel.
At 00:01 on 28 October, her owners instruct the master to change course and head for Rotterdam via Cape Town, a voyage that will now take more than 30 days (From his present position, it will take 12 days to steam to Cape Town and from Cape Town, it will take 18 days to Rotterdam.) Second Engineer Singh would have signed off on leave when the ship arrived in Rotterdam, but now he must sign off in Cape Town and be repatriated to India.

3.3.1 Compile a message from the master of the ship to the Cape Town agents (Cape Shipping) in which he gives his ETA at Cape Town, his ship's bunker requirements for the rest of the voyage, and lists the ship's other requirements on arrival. *NB: You must show separately the calculations to find the ETA and the fuel requirements.* (18)

3.3.2 Assume the ship will spend one day in Cape Town. What is her ETA in Rotterdam? (4)

3.3.3 If ships are being diverted from the Suez Canal to the Cape Route, how will the following be affected?

(a) South African ports (a positive *and* a negative effect). (4)

(b) South African stevedores (Be careful and remember that stevedores handle cargo.) (2)

(c) South African bunker suppliers. (2)

(d) The economy of the areas surrounding the major South African ports. (2)

(e) Pilots working for the Suez Canal Authority. (2)

3.3.4 Refer to your answer to Question 3.3.3(a).

(a) How will the voyage of *Indian Mariner* be affected by the **negative** effect, other than it becoming more expensive to steam via a longer route? (2)

(b) How will *Indian Mariner* contribute in a **positive** way by calling at Cape Town? (2)

3.3.5 Study the lists of ships due in Cape Town and those due to sail as well as the list of pilots available on a given day and answer the questions set.

NOTE:

Ships of over 80 000 GRT require a pilot with an open licence.
Ships of between 40 000 GRT and 80 000 GRT require a pilot with at least an A-Grade licence.
Ships of between 20 000 GRT and 40 000 GRT require a pilot with a least a B-Grade licence.
Ships of between 10 000 GRT and 20 000 GRT require a pilot with at least a C-Grade licence.
Ships of less than 10 000 GRT require a pilot with at least a Beginner licence.
A pilot can handle ships of a lower GRT than his licence, e.g. a pilot with an open licence can handle a ship of 10 000 GRT.
Assume that all ships will need the services of a pilot for 1 hour.
Assume that tugs are available and, for incoming ships, a berth is available.

SHIP'S NAME	GRT	ETA	SHIP'S NAME	GRT	ETD
Pluto	13000	0400	*Mars*	32000	0300
Indian Mariner	22009	0600	*Penelope*	52000	0500
Formosa Star	82000	0630	*Saturn*	3500	0530
Blue Horizon	9000	0830	*Mandarin*	24000	0730

PILOTS AVAILABLE

Captain Peter Jones	Open Licence
Captain Sibu Mthethwa	Open Licence
Captain Sashen Tendulship	A Grade Licence
Captain Joe Petersen	B Grade Licence

(a) How many ships requiring a pilot with at least an open licence are on the lists? (2)

(b) Write down the names of the pilots and next to each, write down the names of the ships you would want him to handle. *Remember that each ship can only be handled by a pilot with the correct licence for that ship or a larger ship.* (12)

(c) Are any ships unable to have a pilot because there are too many ships moving at that time? Answer YES or NO. (2)

3.4 Name the maritime convergence zones described by each of the following:

3.4.1 At the western entrance to the Mediterranean Sea. (2)

3.4.2 To the north-west of Singapore. (2)

3.4.3 Between the Caribbean Sea and the Pacific Ocean. (2)

3.4.4 Of vital importance to the movement of oil. (2)

3.5 The International Ship and Port Security Code (ISPS) was introduced after the '9/11' attacks on New York and Washington in 2001.

3.5.1 Which organisation introduced this code? (2)

3.5.2 Refer to your answer to Question 3.5.1. Of which international organisation is that an agency? (2)

3.5.3 What is the purpose of the ISPS Code? (6)

3.6 Which maritime code or convention deals with each of the following?

3.6.1 Dumping of bilge water. (2)

3.6.2 The number of lifeboats and liferafts on a ship. (2)
[90]

QUESTION 4 MARINE ENVIRONMENTAL CHALLENGES

4.1 Japanese whaling operations in the Southern Ocean have attracted much media attention as the Sea Shepherd organisation has tried to stop the whaling by attacking the whaling vessels. To draw public attention to the Japanese activity, they have rammed whaling vessels, boarded whaling vessels and tried to get in between the hunted whale and the whale catcher.

While their attacks on the Japanese whaling fleet have been shown on television, many believe their tactics are wrong and wonder what would happen if one of the whaling vessels suffered severe damage during one of these encounters with Sea Shepherd and sank. Even if one bunker tank were punctured, one of the beautiful islands in the area could become polluted by bunker oil. This would have a terrible impact on marine life, including thousands of seals, birds, and whales.

Others say that this is the only way to stop whaling, irrespective of other consequences,

In about 100 words, give a good argument for or against the tactics used by the Sea Shepherd organisation. (14)

4.2 Study the map that is Addendum Three and answer the questions set.

4.2.1 What is the weather system at A? (2)

4.2.2 How will this affect a ship on passage from Cape Town (C) to Buenos Aires (B)? (8)

4.2.3 How could this system affect harbour operations in Cape Town? (6)

[30]

Total: 300 marks