



NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2011

NAUTICAL SCIENCE: PAPER II

Time: 3 hours

150 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of 4 pages. Please check that your question paper is complete.
 2. Answer **ALL** the questions in Sections A, B and C.
 3. Begin the answer to each new question on a new page.
 4. The use of scientific calculators is permitted.
 5. Alphanumeric calculators and dictionaries are **NOT** permitted.
 6. Nautical tables may be used.
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REQUIREMENTS

Drawing instruments
Radar Plotting Sheet

ANNEXURES

1. NIL
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SECTION A SEAMANSHIP**QUESTION 1**

- 1.1 In terms of the International Regulations for Preventing Collisions at Sea, 1972, as amended (the COLREGS), what action should a power driven vessel take when being overtaken by another vessel and there is a risk of collision? (8)
- 1.2 What vessels are required to comply with the COLREGS? (4)
- 1.3 Define the term 'vessel engaged in fishing'. (7)
- 1.4 Describe with the aid of a sketch, the lights and day shapes that a vessel not under command (NUC) is required to exhibit whilst under way. (6)
- 1.5 Two power-driven vessels making way through the water and crossing are in risk of collision. What is the responsibility of each of these vessels in terms of the COLREGS? (5)
- [30]**

QUESTION 2

List ten action points the OOW would immediately take in the event of the vessel running aground.

[10]

QUESTION 3

- 3.1 A box-shaped vessel floats at a draft of 2,1 m in dock water density 1 020 kg/m³. What will the draft be for the vessel at the same displacement in salt water of density 1 025 kg/m³? (5)
- 3.2 Define the following terms:
- 3.2.1 Deadweight of a vessel (4)
- 3.2.2 'Reserve buoyancy' (3)
- 3.3 What is the statutory freeboard of a ship? Illustrate this by means of a sketch showing the load line and the deck line. (8)
- [20]**

QUESTION 4

You are the OOW navigating in restricted visibility on a course heading 075° (T) and at a reduced speed of 10 knots. You detect a radar target which you have been plotting with the following bearings and ranges:

Time	Bearing	Range
10h06	030° (T)	10,0 M
10h12	033° (T)	8,0 M
10h18	038° (T)	6,0 M

- 4.1 Plot the target's movements on the plotting sheet provided. (5)
- 4.2 Prepare a full target report. (10)
- 4.3 From the above report, what action would you take to avoid a close quarter situation? (5)
- [20]**

QUESTION 5

- 5.1 Container vessels have replaced many general cargo vessels.
- 5.1.1 List four advantages of containerisation. (4)
- 5.1.2 List four disadvantages of containerisation. (4)
- 5.2 Name two products that a reefer vessel will load out of Cape Town. (2)
- [10]**

90 marks

SECTION B COMMUNICATIONS AND METEOROLOGY**QUESTION 6**

- 6.1 How would you transmit a distress message by VHF (very high frequency) radio? Assume the name of your ship is 'Agulhas' and the call sign is ZSST. Use the phonetic alphabet where necessary. (10)
- 6.2 What flag signal is flown by a ship indicating "I am disabled; COMMUNICATE WITH ME"? Give the phonetic alphabet for this flag signal. (3)
- 6.3 Which is the most important flag flown by a ship in port, and where on the ship would this flag be displayed? (2)
- [15]**

QUESTION 7

- 7.1 What causes wind to blow in a particular direction? (2)
- 7.2 Near the equator the wind tends to move parallel to the isobars, but elsewhere it tends to be deflected. What is the deflecting force called? (1)
- 7.3 In which direction is the deflection in the southern hemisphere? (2)
- 7.4 Describe with the aid of a sketch what a 'Col' is. In your sketch show the relevant pressures of each of the isobars and wind direction, assuming this is in the southern hemisphere. (15)
- [20]**

35 marks

SECTION C SAILINGS**QUESTION 8**

On a passage from Cape Town to New York on the 27th August at noon (GMT – 2) the position of the vessel was fixed at Lat. 12° 06'N; Long. 037° 21'W.

The following day, 28th August the noon position was fixed at Lat. 16° 54'N; Long. 043° 12'W. During the night the ship's clocks were retarded 1 hour to GMT – 3.

Calculate the course made good and the average speed of the vessel for the 'days run' using the Plane Sailing Method.

25 marks

Total: 150 marks