



NATIONAL SENIOR CERTIFICATE EXAMINATION  
NOVEMBER 2013

**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.
  7. It is in your own interest to write legibly and present your work neatly.
- 

**REQUIREMENTS**

Drawing instruments  
Radar Plotting Sheet

**ANNEXURES**

1. NIL
-

**SECTION A SEAMANSHIP****QUESTION 1**

In terms of the International Regulations for Preventing Collisions at Sea, 1972, as amended (COLREGS):

- 1.1 What action should a sailing vessel take having sighted a tug with a tow displaying the day signals indicating that it is severely restricted in ability to manoeuvre? The tug is on a steady bearing two points off the port bow. (5)
- 1.2 Describe and illustrate the day signals displayed on the tug and its tow when the length of the tow exceeds 200 metres, and the towing vessel is severely restricted in ability to manoeuvre. (10)
- 1.3 What do the following terms mean:
- 1.3.1 'sailing vessel'? (2)
- 1.3.2 'vessel engaged in fishing'? (8)
- 1.4 When two vessels are in sight of one another and the one sound five short and rapid blasts on the whistle, what does this signal mean? (5)
- [30]**

**QUESTION 2**

What preparations should a rescue vessel make while searching for and expecting to recover survivors from the sea? List at least 10 activities to prepare on board when drawing up a plan to recover the survivors.

**[10]**

**QUESTION 3**

- 3.1 Illustrate with a neat drawing the typical loadline marks on the side of a vessel with the following details:
- 3.1.1 Deck line
- 3.1.2 Plimsoll Mark with Lloyd's Register
- 3.1.3 Freshwater line
- 3.1.4 Tropical freshwater line
- 3.1.5 Tropical loadline
- 3.1.6 Summer loadline
- 3.1.7 Winter loadline
- 3.1.8 Winter North Atlantic loadline (10)

- 3.2 What is the freeboard of a ship? (2)
- 3.3 What is the Gross Tonnage of a ship? (4)
- 3.4 What is the deadweight of a ship? (4)
- [20]**

#### QUESTION 4

A vessel navigating in reduced visibility estimated to be less than 1 000 metres is on a course of  $065^\circ$  (T) with a speed of 8 knots.

The following observations were made of an approaching target detected on Radar:

TIME	BEARING	RANGE
08:00	$260^\circ$ (T)	10.0 miles
08:06	$260^\circ$ (T)	8.7 miles
08:12	$260^\circ$ (T)	7.5 miles

- 4.1 Plot the target on the plotting sheet provided. (5)
- 4.2 Compile a full target report at 08:12. (10)
- 4.3 At 08:24 the target is bearing  $260^\circ$  (T) at 4.8 miles. What action would you take to avoid a close quarter situation? (5)
- [20]**

#### QUESTION 5

Describe the design features of a DRY BULK CARRIER. Illustrate your answer with a sketch of the cross-section of a typical bulk carrier. **[10]**

<b>90 marks</b>
-----------------

**SECTION B COMMUNICATIONS AND METEOROLOGY**

**QUESTION 6**

- 6.1 Describe what an EPIRB is. (10)
- 6.2 GMDS requires ships of 300 gross tonnes and above on international voyages to have a range of equipment capable of performing nine communication functions. List five of these functions. (5)
- [15]**

**QUESTION 7**

Explain how land and sea breezes are caused. [20]

**35 marks**

**SECTION C SAILINGS**

**QUESTION 8**

- 8.1 What is the course and distance from a position off Cape Town in Lat. 33° 45'S Long. 018° 15'E to the Rio Plata Lat. 35° 30'S Long. 055° 00'W?

LATITUDE	MERIDIONAL PARTS
33° 45'S	2140.41
35° 30'S	2267.43

(20)

- 8.2 If the vessel departs from this position off Cape Town on 2<sup>nd</sup> February at 14:00 (Time Zone 'B') and is expected to average 19 knots, what is the ETA at the position off the Rio Plata (Time Zone 'Q')? (5)
- [25]**

**25 marks**

**Total: 150 marks**