



NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2017

NAUTICAL SCIENCE: PAPER II

Time: 3 hours

150 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of 6 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 to present your work neatly.
-

REQUIREMENTS

Drawing Instruments
Radar Plotting Sheet

ANNEXURES – Nil

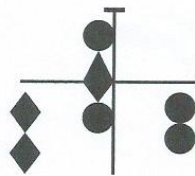
SECTION A SEAMANSHIP

QUESTION 1

In compliance with the Convention on the International Regulations for Preventing Collisions at Sea, 1972 as amended (hereinafter referred to as the COLREGs), answer the following questions:

1.1 How should the Officer of the Watch ascertain whether a risk of collision exists between two vessels approaching one another? (5)

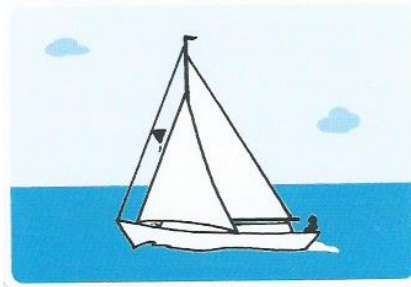
1.2 From the bridge you sight a vessel ahead on a steady bearing displaying the following day signal:



(a) What do these signals tell you about the operation of this vessel? (2)

(b) What is your course of action if this vessel is seen right ahead? (4)

1.3 When approaching the harbour you see a sailing vessel outbound. The vessel displays a day signal of a "black cone" apex down, in the forepart where it can best be seen.



(a) What does this signal mean? (3)

(b) What fog signal will this vessel sound? (4)

1.4 Two vessels are proceeding down a channel, the one overtaking the other. In terms of the COLREGs, the overtaking vessel is to "give-way", and the other is to "stand-on". What do you understand by the terms:

(a) "Give-way vessel"? (4)

(b) "Stand-on vessel"? (4)

- 1.5 State which vessels must comply with the COLREGs. (4)
- 1.6 A vessel over 50 metres in length is stopped and not making way through the water due to a machinery breakdown and is therefore "not under command".
- (a) State what lights and day shapes are required to be displayed by this vessel, and support your answer with a sketch for each (night and day). (7)
- (b) What fog signal would this vessel sound? (3)
- [40]**

QUESTION 2

- 2.1 List six action points in preparing to abandon ship (fitted with gravity davits). (6)
- 2.2 Name four action points that should be completed with the boats and life rafts immediately after they have been launched in the water. (4)
- [10]**

QUESTION 3

Explain the effect on a vessel's stability and draught when a mass of weight is shifted within the vessel if:

- 3.1 bunker fuel is transferred aft from No. 1 double bottom tanks port and starboard to the engine room service tanks centre. (3)
- 3.2 ballast water is transferred from No. 4 upper wing tank port to No. 4 double bottom tank starboard. (6)
- 3.3 ten containers are shifted from No. 4 lower hold starboard to No. 4 hatch top port side. (6)
- [15]**

QUESTION 4

Your vessel is navigating in restricted visibility on a course of 030° (T), speed 6 kt. A target is detected on the 12-mile radar range. The following bearings and ranges were recorded:

TIME	BEARING	RANGE
10h00	324° (T)	11,4 m
10h03	325° (T)	10,5 m
10h06	325½° (T)	9,6 m

- 4.1 Plot the target on the plotting sheet provided. (7)
- 4.2 Prepare a full target report. (6)
- 4.3 Explain what action you would take to avoid a close quarter situation with the target. (7)
- [20]**

QUESTION 5

General cargo vessels are also referred to as break-bulk vessels. What is the difference between a break-bulk ship and a container ship?

[5]

90 marks

SECTION C SAILINGS**QUESTION 8**

A vessel is preparing a passage from Vigo, Spain to Recife, Brazil.

- 8.1 Calculate the course and distance by Mercator sailing from the following waypoints:

Vigo W.P.	42° 00' N 009° 30' W	
Recife W.P.	08° 00' S 034° 40' W	(20)

- 8.2 What is the steaming time at 18 knots to reach Recife? (5)

25 marks

Total: 150 marks