NATIONAL SENIOR CERTIFICATE EXAMINATION
MAY 2025

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 to present your work neatly.

REQUIREMENTS

Drawing instruments
Radar plotting sheet

IEB Copyright © 2025

SECTION A SEAMANSHIP

QUESTION 1

The following questions are to be answered in terms of the International Regulations for Preventing Collisions at Sea, 1972, and as amended (COLREGS).

1.1 The following vessels under way in clear weather are in close proximity of each other so as to involve possible risk of collision. What is the responsibility of each of these vessels in respect to the other two vessels?

1.1.1 A power-driven vessel (3)

1.1.2 A trawler engaged in trawling (3)

1.1.3 A yacht under sail (3)

1.2 What are the fog signals of the following vessels?

1.2.1 A tug towing another vessel (4)

1.2.2 A vessel of 100 m or more in length at anchor (7)

1.2.3 The additional signal for a vessel at anchor to warn of her position and the possibility of collision of an approaching vessel (4)

1.3 Describe, with the aid of a sketch, the lights and day shapes that a vessel under way and greater than 20 m in length will display when engaged in fishing. (6)

[30]

QUESTION 2

List FIVE action points that you would take on discovering a fire in a cabin during routine deck rounds during the early hours of the morning on board your ship.

[10]

QUESTION 3

Explain, with the aid of diagrams, the following terms:

3.1 metacentre (6)

3.2 the metacentric height (6)

3.3 stable equilibrium of a vessel (8)

[20]

IEB Copyright © 2025

QUESTION 4

Your vessel is steering a course 336º (T) at 10 knots. Visibility is about 5 cables.

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

	Target 'A'	
TIME	**BEARING**	**RANGE**
22h00	270º (T)	11,0 miles
22h06	271º (T)	9,0 miles
22h12	272º (T)	7,0 miles

4.1 Plot the target on the plotting sheet provided. (8)

4.2 Compile a full target report including the target's aspect at 22h12. (5)

4.3 What action, if any, would you take at 22:12 in order to avoid a close quarter situation? (7)

[20]

QUESTION 5

Describe the design features of a Dry Bulk Carrier. Illustrate with labels your answer with a sketch of the cross-section of a typical bulk carrier.

[10]

90 marks

IEB Copyright © 2025

SECTION B COMMUNICATIONS AND METEOROLOGY

QUESTION 6

6.1 Write an example of a SAFETY message. (5)

6.2 List FIVE operating procedures when making a radio call or transmission. (5)
[10]

QUESTION 7

7.1 Describe the vertical and horizontal air flow and type of weather generally associated with a southern hemisphere cold front or frontal depression. (20)

7.2 Include diagrams to support your description. (10)
[30]

40 marks

SECTION C SAILINGS

QUESTION 8

Calculate the course and distance from the waypoint 'A' in Lat. 33° 15'S Long. 028° 00'E to the next waypoint 'B' in Lat. 34° 00'S Long. 026° 00'E.

[20]

20 marks

Total: 150 marks

IEB Copyright © 2025