NATIONAL SENIOR CERTIFICATE EXAMINATION
SUPPLEMENTARY EXAMINATION – MARCH 2018

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

ANNEXURES – Nil

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SECTION A SEAMANSHIP

QUESTION 1

1.1 The following vessels under way in clear weather are in close proximity of one another so as to involve possible risk of collision:

1.1.1 a pilot vessel on duty. (3)

1.1.2 a trawler engaged in trawling. (3)

1.1.3 a yacht under sail. (3)

In terms of the International Regulations for Preventing Collisions at Sea, 1972, as amended (COLREGS), what is the responsibility of each of these vessels with respect to the other two vessels?

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 upon 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. (7)

3.2 the metacentric height. (7)

3.3 stable equilibrium of a vessel. (6)

[20]

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QUESTION 4

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

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

TIME	BEARING	RANGE
22:22	270° (T)	11 miles
22:28	271° (T)	9 miles
22:34	272° (T)	7 miles

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

4.2 Compile a target report at 22:34. (7)

4.3 What action, if any, would you take at 22:34 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]

90 marks

SECTION B COMMUNICATIONS AND METEOROLOGY

QUESTION 6

6.1 What is a 'SAFETY' message? (4)

6.2 Give an example of a SAFETY message. (6)

6.3 List five operating procedures when making a radio call or transmission. (5)
[15]

QUESTION 7

7.1 With the aid of diagrams, explain the vertical and horizontal airflow and type of weather generally associated with a southern hemisphere cold front or frontal depression. (15)

7.2 Describe a HYGROMETER and what its purpose is to a navigator at sea. (5)
[20]

35 marks

SECTION C SAILINGS

QUESTION 8

8.1 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. (15)

8.2 At a speed of 18½ knots, what is the steaming time between waypoints A and B? (5)
[20]

QUESTION 9

Explain the reason why 'Plane Sailing' is used in certain circumstances and 'Mercator Sailing' in different circumstances.

[5]

25 marks

Total: 150 marks

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