NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2018

NAUTICAL SCIENCE: PAPER II

MARKING GUIDELINES

Time: 3 hours Marks: 150

These marking guidelines are prepared for use by examiners and sub-examiners, all of whom are required to attend a standardisation meeting to ensure that the guidelines are consistently interpreted and applied in the marking of candidates' scripts.

The IEB will not enter into any discussions or correspondence about any marking guidelines. It is acknowledged that there may be different views about some matters of emphasis or detail in the guidelines. It is also recognised that, without the benefit of attendance at a standardisation meeting, there may be different interpretations of the application of the marking guidelines.

SECTION A SEAMANSHIP

QUESTION 1

1.1 The vessel being overtaken is the stand-on vessel and must comply with Rule 17(a); (i) & (ii).

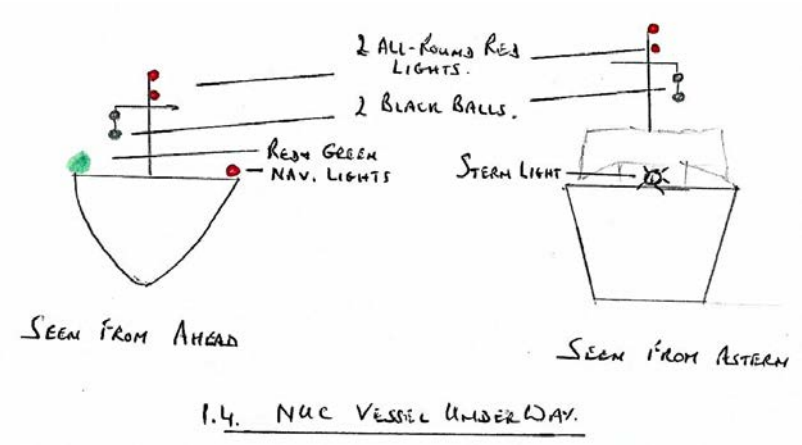
(i) Where one of the two vessels is to keep out of the way, the other shall keep her course and speed.

(ii) The latter vessel may, however, take action to avoid collision by her manoeuvre alone, as soon as it becomes apparent to her that the vessel required to keep out of the way is not taking appropriate action in compliance with these rules. (8)

1.2 It means any vessel fishing with nets, lines, trawls or any other fishing apparatus which restricts manoeuvrability, but does not include a vessel with trolling lines or other fishing apparatus which do not restrict manoeuvrability. (8)

1.3 It means that a vessel is not at anchor, or made fast to the shore, or aground. (2)

1.4
- Two all-round red lights in a vertical line where they can best be seen; (1)
- Two balls or similar shapes in a vertical line where they can best be seen; (1)
- The red and green sidelights and a stern light. (1)



(5)

1.5 Rule 15 – When two power-driven vessels are crossing so as to involve risk of collision, the vessel which has the other on her own starboard side shall keep out of the way and shall, if the circumstances of the case admit, avoid crossing ahead of the other vessel. (4)

[30]

QUESTION 2

1. Stop engines. (1)

2. Activate the general alarm and assemble crew. (1)

3. Call the Master.

4. Inform the engine room, ballast and fire pumps ready for use. (1)

5. Display the required lights and shapes, turn the deck lights on.

6. Plot position of the vessel on the chart. (1)
7. Assess the times of the tides and tidal range.
8. Prepare to transmit an emergency message to request assistance.
9. Maintain a rough log of times and incidents. Update the Deck Logbook as soon as possible.

10. Shut and secure all watertight doors and portholes. (1)

11. Prepare anchors (1)

12. Assemble emergency party to assess damage. (1)

13. Sound all compartments and monitor the ingress of water.

14. Draw up a ballasting and fuel transfer plan. (1)

15. Prepare the lifeboats and rafts for launching. (1)

16. Inform the owners, charterers and coastal authorities. (1)

Or any other relevant actions that may be listed.

[10]

QUESTION 3

3.1 This is a starboard hand buoy and should be left to starboard when inbound or in the conventional direction of the buoyage for that port. (1)

3.2 3.2.1 Red and green (2)

3.2.2 Red and white vertical stripes (2)

3.2.3 Yellow (1)

3.3 3.3.1 Two cones, points or apexes pointing inwards. (2)

3.3.2 Two cones, bases together and points or apexes pointing outwards. (2)

3.3.3 Two cones, points or apexes pointing downwards. (2)

3.4 On the eastern side. (1)

3.5 Safe water. (1)

3.6 On either/any side. (1)
[15]

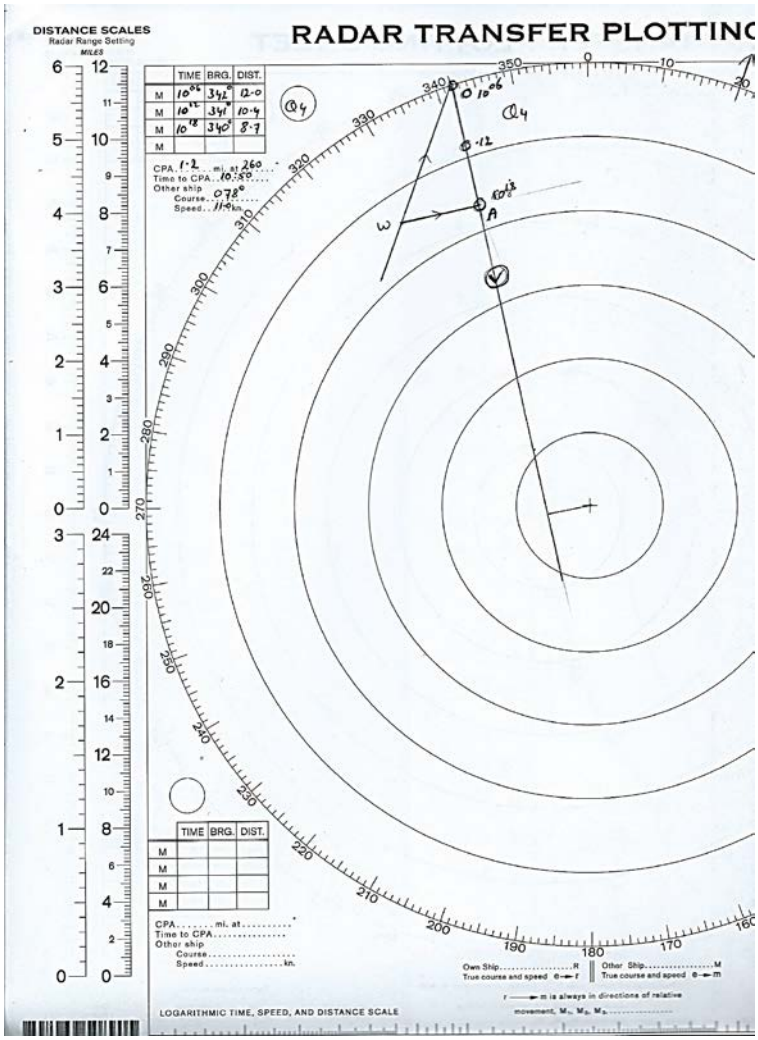
QUESTION 4

4.1 See the attached plotting sheet. (10)

4.2

1.	Contact ID	'Q4'
2.	Time of 1st plot	10:06
3.	Initial range	12 miles
4.	CPA	1,2 miles
5.	TCPA	10:50
6.	Heading of target	078° (T)
7.	Speed of target	11,0 knots (5)

4.3 The CPA of the target is less than two miles (standing instructions). The target is crossing on the port side (aspect Green 95^{o}). Own ship is the stand-on vessel. Continue to monitor and alter at 4 mls.
Therefore, the Master should be called. (5)
[20]



QUESTION 5

5.1 Features of a Ro-Ro ship:

- The prime feature of a Ro-Ro vessel is that cargo can be loaded on and off on wheels by trailers or in trucks, and can be moved around within the vessel to be stowed on or off the wheeled transport.
- Has a ramp on the stern or quarter for driving cargo on and off the vessel. On some vessels the ramps are on the side.
- Internal fixed and/or closing ramps to access different deck levels.
- Equipped with a set of mobile cargo-handling equipment such as forklifts, container stackers, low-bed trailers and mechanical horse or tractors for towing the trailers.
- Multi-decked interlinked by ramps. In some cases there may be lifts or hoists to move from one deck to the next.
- The vessels are normally self-supporting and not reliant on equipment or infrastructure from ashore.
- Capable of handling large or small parcels of cargo including containers and heavy lifts or abnormal size cargo. (5)

5.2 Reefer vessel

- A vessel designed to carry refrigerated cargo such as perishable fruit and meat.
- It is a multi-hatch/hold (usually four or five) and multi-deck vessel designed for palletised cargoes.
- Fitted out with cranes of capacity up to 25 tons.
- Holds are insulated. Each deck and each hold temperature controlled from –20 °C to ambient temperature.
- The more recently designed reefer vessels also carry integral reefer containers on deck and have larger crane capacity (35 t) to handle the containers. (5)

5.3 Reefer export products from South Africa:

- Deciduous fruit
- Citrus fruit
- Avocado Pears
- Beef
- Fish
- Flowers (5)

[15]

90 marks

SECTION B COMMUNICATIONS AND METEOROLOGY

QUESTION 6

6.1 An "Urgency" message indicates that the **station transmitting it has urgent information concerning the safety of the vessel or persons**. It is only sent on the **authority of the Captain**. The urgency message will have **priority over all other communications except distress**. The transmission **should not be interrupted or interfered with**. (5)

6.2 SECURITE SECURITE SECURITE
THIS IS CORMORANT CORMORANT CORMORANT
ZULU TANGO OSCAR PAPA
A WHITE SIX METRE CONTAINER SIGHTED DRIFTING SEMI SUBMERGED IN POSITION CAPE RECIFE LIGHT BEARING 355 DEGREES X 8 MILES
WIND EAST FORCE 4 VISIBILITY GOOD WEATHER OVERCAST
OUT (6)

6.3 2182 kHz
VHF Channel 16 or 156.8 MHz (2)

6.4 Silent periods on 2182 kHz voice:
- Every hour, beginning on the hour and lasting for three minutes.
- Every half hour, beginning on the half hour and lasting for three minutes. (2)

[15]

QUESTION 7

7.1 Wind is the movement of air from a high pressure to a low pressure. (2)

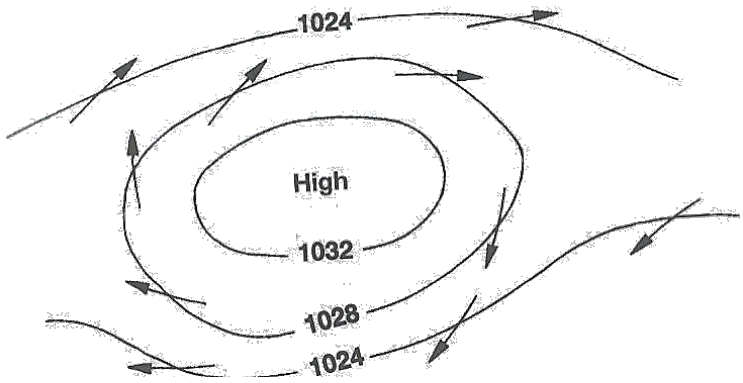
7.2 Geostrophic or Coriolis. (1)

7.3 Right or anti-clockwise from the high-pressure centre.
Buys Ballot's Law – If, in the northern hemisphere, an observer faces the wind, pressure is lower on his right hand than on his left whilst the converse is true in the southern hemisphere. (2)

7.4 An anticyclone is a region of high pressure surrounded by an area of relatively low pressure.

The isobars are circular or oval in shape.

In the northern hemisphere, the wind circulates in a clockwise direction round the centre of the high pressure.



(15)
[20]

35 marks

SECTION C SAILINGS

QUESTION 8

8.1

	LAT	Mid-LAT	LONG
Own ship	31º 06' S	31º 06' S	013º 35' E
Distress position	26º 34' S	26 º 34' S	006º 14' E
D.Lat/D.Long	4º 32' N	57º 40' .	7º 21' W
Mid-Lat	272' N	28º 50' .	441' W

Dep. = D.Long × Cos M.Lat 441 × Cos 28º50'

Dep. 386,328

Tan Co. = Dep/D.Lat 386,328/272 Dist. = DLat/Cos Co. 272/Cos 55º

S55ºE (20)

8.2 Course = **305º (T)** Distance = **474,0 m**

Steaming time @ 22 kts Dist./Speed
4474/22
21,545 hrs
0,8977 day

Fuel consumption 74 × 0,8977
Consumption = **66,4 tons** (5)

25 marks

Total: 150 marks