



NATIONAL SENIOR CERTIFICATE EXAMINATION  
NOVEMBER 2014

**NAUTICAL SCIENCE: PAPER II**  
**MARKING GUIDELINES**

Time: 3 hours

Marks: 150

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**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.**

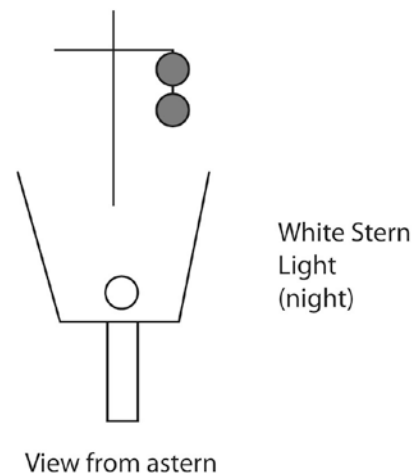
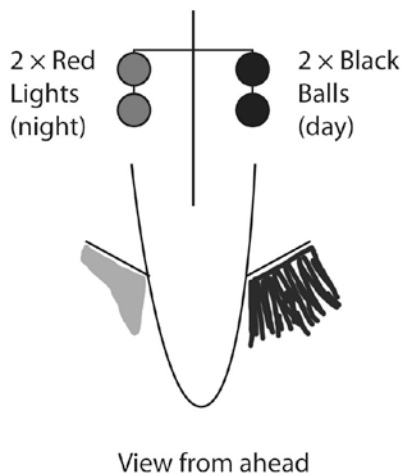
**The IEB will not enter into any discussions or correspondence about any marking guidelines. It is acknowledged that there may be different views about some matters of emphasis or detail in the guidelines. It is also recognised that, without the benefit of attendance at a standardisation meeting, there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

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**SECTION A SEAMANSHIP**

**QUESTION 1**

- 1.1 The vessel being overtaken is the stand-on vessel and so complies with Rule 17(a); (i) and (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 All vessels upon the high seas and in all waters connected there with navigable by seagoing vessels. (2)
- 1.3 1.3.1 The term 'vessel restricted in her ability to manoeuvre' means a vessel which from the nature of her work is restricted in her ability to manoeuvre as required by the COLREGS and is therefore unable to keep out of the way of another vessel. (4)
- 1.3.2 Rule 3 g. states 'the term restricted in her ability to manoeuvre shall include but not be limited to':  
 • vessel engaged in laying, servicing or picking up navigational marks, submarine cables or pipelines;  
 • vessel engaged in surveying, dredging or underwater operations;  
 • vessel engaged in replenishment or transferring persons, provisions or cargo while underway;  
 • vessel engaged in launching or recovery of aircraft;  
 • vessel engaged in mine clearance operations;  
 • vessel engaged in towing operations that severely restrict the towing vessel and her tow in their ability to deviate from the course. (6)
- 1.4 Two all-round red lights in a vertical line where they can best be seen;  
 • Two balls or similar shapes in a vertical line where they can best be seen; (2)  
 • The red and green sidelights and a stern light. (2)



- 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) Inform the engine room (1)
  - 4) Plot position of the vessel on the chart
  - 5) Assess the times of the tides and tidal range
  - 6) Prepare to transmit an emergency message and request assistance
  - 7) Maintain a rough log of times and incidents. Update the Deck Log Book as soon as possible (1)
  - 8) Shut and secure all watertight doors and portholes (1)
  - 9) Prepare anchors and let go the seaward side anchor (1)
  - 10) Assemble emergency party to assess damage
  - 11) Sound all compartments and monitor the ingress of water (1)
  - 12) Draw up a ballasting and fuel transfer plan (1)
  - 13) Prepare the lifeboats and rafts for launching (1)
  - 14) Inform the owners, charterers and coastal authorities (1)
- And more ... (1)  
[10]

**QUESTION 3**

- 3.1 This is a port hand buoy and should be left to starboard when outbound. (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 Can and cone (2)  
3.3.2 'X' shape (1)  
3.3.3 Two black balls vertically disposed (2)
- 3.4 On the eastern side (1)
- 3.5 On the southern side (1)
- 3.6 Safe water (1)
- 3.7 On either/any side (1)  
[15]

**QUESTION 4**

- 4.1 See the attached plotting sheet. (5)
- 4.2 Contact ID 'A'  
 Time of 1<sup>st</sup> plot 10:06 (1)  
 Initial range 8 miles (1)  
 Heading of target 170° (T) (3)  
 Speed of target Stopped (3)  
 CPA 0 M. Collision  
 TCPA 10:30 (2)
- 4.3 The target is stopped or stationary. Therefore make a bold alteration (about 30°) to starboard or port to pass clear of the target by 2 miles.  
 Continue to monitor the target. (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 4 or 5) and multi-deck 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 recent designed reefer vessels also carry integral reefer containers on deck and have larger crane capacity (35T) 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  
× 8 MILES  
WIND EAST FORCE 4 VISIBILITY GOOD WEATHER OVERCAST (6)  
OUT 1
- 6.3 2182kHz (2)
- 6.4 Every hour beginning on the hour and lasting for 3 minutes. (2)  
Every half-hour beginning on the half hour and lasting for 3 minutes.

[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 Left or clockwise from the high pressure centre. Or an anticlockwise direction round the area of low pressure.  
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 A Col is a region **between two depression (Low) systems and two diametrically opposed anti-cyclone (High) systems. The pressure at the Col is generally lower than around the high pressures and higher than around the low pressures.** (3)  
**The pressure gradients tend to be small and hence there will be light and variable winds or airs.** (2)

The **associated weather** will depend on the nature and interaction of the various surrounding systems. But in general the **relative humidity is high and there may be fog, or thunderstorms.** (3)

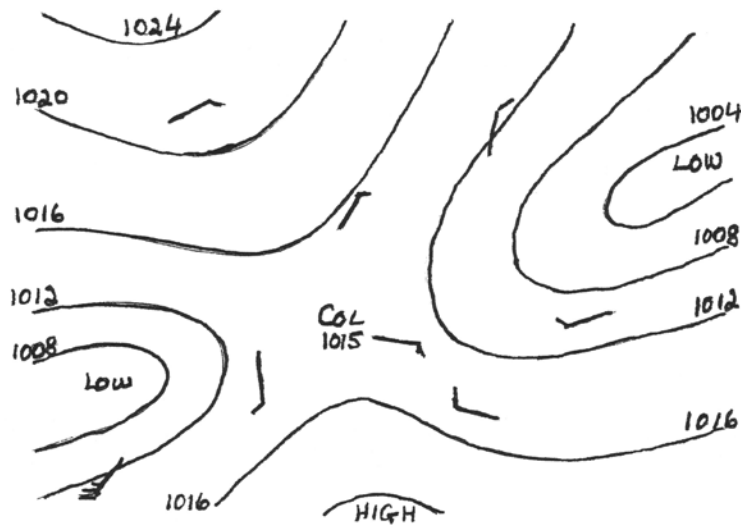


Figure 70 COL

(15)  
[20]

35 marks

