



NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2010

NAUTICAL SCIENCE: PAPER II

MARKING GUIDELINES

Time: 3 hours

150 marks

These marking guidelines were used as the basis for the official IEB marking session. They were prepared for use by examiners and sub-examiners, all of whom were required to attend a rigorous standardisation meeting to ensure that the guidelines were consistently and fairly interpreted and applied in the marking of candidates' scripts.

At standardisation meetings, decisions are taken regarding the allocation of marks in the interests of fairness to all candidates in the context of an entirely summative assessment.

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, and different interpretations of the application thereof. Hence, the specific mark allocations have been omitted.

SECTION A SEAMANSHIP**QUESTION 1**

- 1.1 (a) Responsibility of the tug and tow heading north:
- In respect of the trawler, the tug must keep clear of the vessel engaged in fishing (Rule 18(a) (iii)).
 - The tug should either reduce speed if possible, or make a bold alteration to port to allow the trawler to pass ahead.
 - The tug must signal its intention to alter course to port with two short blasts on the whistle.
- (b) Responsibility of the tanker:
- As an overtaking vessel, she must keep well clear of the tug and tow (Rule 13).
 - In respect of the trawler, the 'stand-on vessel', the tanker must keep out of the way (Rule 18(a) (iii)).
 - The tanker should either make a bold alteration to starboard to pass well ahead of the trawler; or reduce speed, or stop, to allow the trawler to pass ahead. She should then proceed with caution, keeping well clear of both the trawler and tug and tow.
- (c) Responsibility of the trawler (engaged in fishing):
- Maintain her course and speed (Rule 17a), but she may take action to avoid collision by her maneuver alone as soon as it becomes apparent to her that either one or both of the other vessels is not taking appropriate action in compliance with the rules (Rule 17a(ii), (b) & (c)). In which case she should give five short and rapid blasts on the whistle (Rule 34 (d)).

(10)

- 1.2 (a) Tug – sound at intervals of not more than two minutes three blasts in succession, namely one prolonged followed by two short blasts (Rule 35 (c)).
- (b) Vessel towed – the last vessel in the tow, if manned, shall at intervals of not more than two minutes sound four blasts in succession, namely one prolonged followed by three short blasts. Where practical, this signal shall be made immediately after the signal made by the towing vessel (Rule 35(d)).
- (c) Tanker – a power driven vessel making way through the water shall sound at intervals of not more than two minutes one prolonged blast (Rule 35(a)).
- (d) Trawler – sound at intervals of not more than two minutes three blasts in succession, namely one prolonged followed by two short blasts (Rule 35 (c)).

(3 × 2 = 6)

1.3

1.3.1 Viewed from ahead:

○ White steaming light



3 Red all-round lights



○ White steaming light



Red & Green side lights

(3)

1.3.2 Viewed from astern:



3 Red all-round lights



White stern light

(3)

1.4 In terms of Rule 34 (a & b):

- One short blast – Alter course to starboard;
- Two short blasts – Alter course to port;
- Three short blasts – Going astern;
- Five short and rapid blasts – If a vessel fails to understand the intentions of the other vessel, or is in doubt of the other's actions, then she shall immediately sound five short and rapid blasts on the whistle (Rule 34(d)).

(4 × 2 = 8)

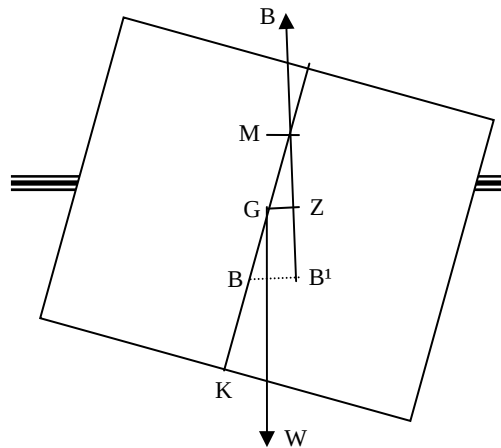
[30]**QUESTION 2**

- (1) Mark the position on the chart and in the Satnav receiver as 'waypoint' or 'datum point'.
- (2) Release a lifebuoy preferably with a light or smoke marker.
- (3) Sound the general alarm.
- (4) Helm hard over toward the side from which the person has fallen.
- (5) Signal 'O' by flag.
- (6) Post lookouts.
- (7) Engine room to stand-by, and reduce to manoeuvring speed.
- (8) Steady up on the reciprocal course (180°) for a few minutes to regain speed, and then put the helm hard over in the same direction to return to the original course. Alternatively the Williamson Turn:
 - Full helm through approximately 60°
 - Then put the helm hard over in the opposite direction
 - Bring the vessel round to the reciprocal course
- (9) Prepare the motor lifeboat.
- (10) Prepare recovery equipment such as cargo nets, ropes, buoys, ladders, etc.
- (11) Broadcast SECURITE or a navigation warning, and inform the Owners or Operators.
- (12) Prepare the chart for an appropriate search pattern.
- (13) Prepare the medical facilities on board to receive casualties.

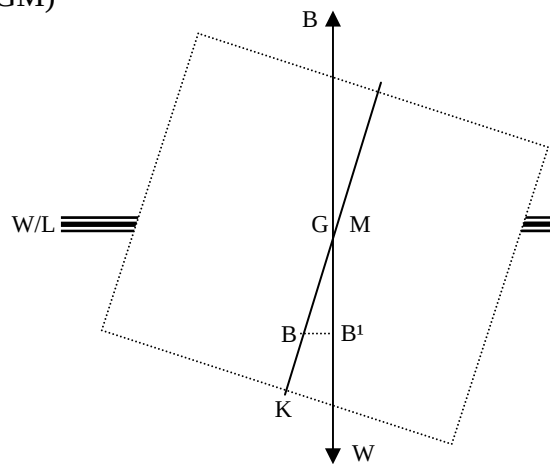
[10]

QUESTION 3

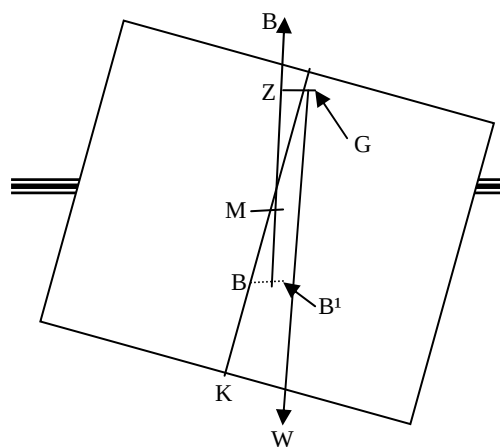
3.1 3.1.1 Stable (+ GM) –



3.1.2 Unstable (-GM)



3.1.3 Neutral (Ø)



- 3.1 Legend –
- K = Keel
 - B = Centre of buoyancy
 - B¹ = Shift of centre of buoyancy when heeled
 - G = Centre of gravity of vessel
 - GZ = Righting lever
 - M = Metacentre
 - W/L = Water line

(3 × 5 = 15)

- 3.2 A vessel 'heels' to starboard due to external forces such as wind, waves, etc. (1)
- 3.3 A vessel 'lists' due to internal forces such as the shifting of weight off the centre line to port or starboard, or the imbalance of weights on either side of the centre line, etc. (1)
- 3.4 Gross tonnage is the internal volume of the ship below the tonnage deck plus the tween deck tonnage which includes the volume of any closed-in spaces on or above the tonnage deck. (3)
- [20]**

QUESTION 4

- 4.1 See attached plotting sheet. (5)
- 4.2 Target identification 'B'
 Time of initial plot 20:00
 Initial range & bearing 255° (T) x 8,0 miles
 CPA 0 miles collision
 Time of CPA 20:30
 Target's true course 075°
 Target's true speed 20,0 knots. (10)
- 4.3 Alter course 90° to starboard to 165° (T) and continue to carefully monitor the target. (5)
- [20]**

QUESTION 5

- 5.1. Features of a Ro-Ro ship:
- 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.

(5)
[10]

90 marks

SECTION B COMMUNICATIONS AND METEOROLOGY**QUESTION 6**

- 6.1. Sea Area A1 is within radio telephone coverage of at least one VHF coast station from which continuous DSC (Digital Selective Calling) alerting is available. It extends up to 50 nautical miles from the coast station. (3)

- 6.2. Distress Call:
MAYDAY, MAYDAY, MAYDAY
THIS IS ASTOR, ASTOR, ASTOR

Followed by Distress Message:

MAYDAY

ASTOR, CALL SIGN Zulu Siera Alpha Romeo

POSITION NORTH WEST COAST OF DASSEN ISLAND

MY VESSEL IS AGROUND

REQUIRE IMMEDIATE ASSISTANCE

WEATHER – WIND NW FORCE 7, POOR VISIBILITY

OVER.

(12)

[15]

QUESTION 7

- 7.1 Depression

(5)

- 7.2 Anticyclone

(5)

7.3 High Pressure Ridge

(5)

7.4 Low Pressure Trough

(5)
[20]

35 marks

SECTION C SAILINGS

QUESTION 8

	LAT	Meridional Parts	LONG
Noon 13 Feb	31° 06' S	1952.93 S	013° 35' E
W P	18° 55' N	1148.62 N	063° 25' W
D.Lat/DMP/D.Long	50° 01' N	3101.55	77° 00' W
	3001		4620

8.1 Tan Co. = D.Long/DMP
 = 4620 / 3101.55
 = N56°W (10)

Course = 304° (T)

8.2 Distance = D.Lat / Cos Co.
 = 3001 / Cos 56°
 = 5 38 4.1 miles (10)

8.3 St time @ 18 knots = 5384.1 / 18
 = 299.117 hrs
 = 12 d 11 h 7 m

Date	13d	12h	00m
@ 18 kts	12	11	07
ETA (GMT + 1)	25	23	07
Time dif.		-5	00
ETA	<u>25th</u>	<u>18h</u>	<u>07m</u>

(5)
[25]

25 marks

Total: 150 marks