



NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2011

NAUTICAL SCIENCE: PAPER I

MARKING GUIDELINES

Time: 3 hours

Marks: 150

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.

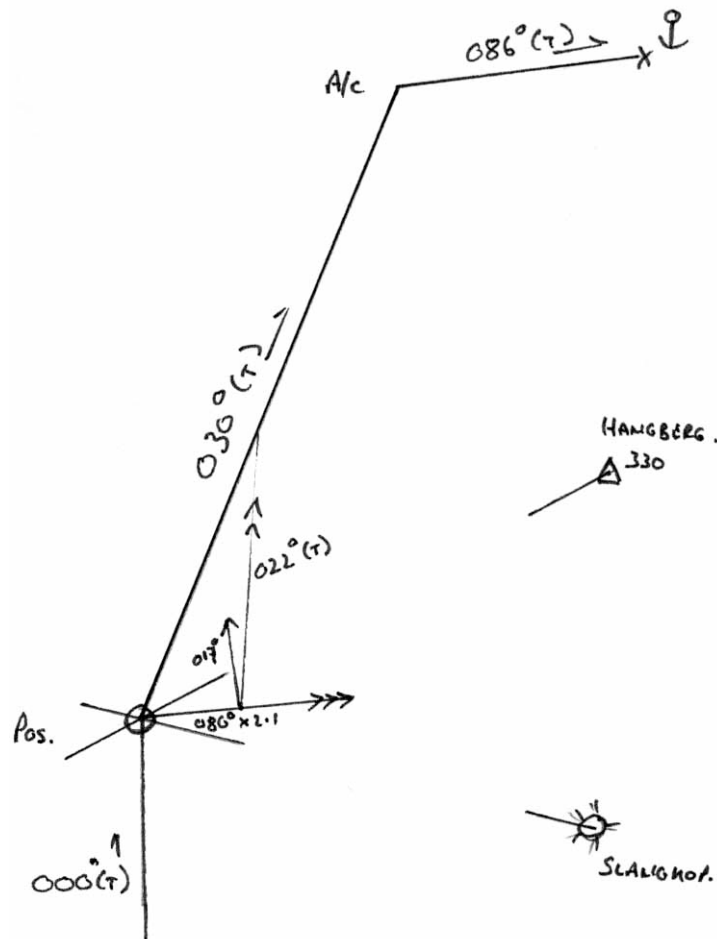
The IEB will not enter into any discussions or correspondence about any marking guidelines. It is acknowledged that there may be different views about some matters of emphasis or detail in the guidelines, and different interpretations of the application thereof. Hence, the specific mark allocations have been omitted.

SECTION A PRACTICAL CHARTWORK

QUESTION 1

	Course	Slangkoppunt Lt.	Hanberg Bcn.
	020° (C)	125° (C)	089° (C)
Deviation	<u>4° E</u>	<u>4° E</u>	<u>4° E</u>
	024° (M)	129° (M)	093° (M)
Variation	<u>24° W</u>	<u>24° W</u>	<u>24° W</u>
	000° (T)	105° (T)	069° (T)

- 1.1 Course to make good 030° (T)
 Course to counter current 022° (T)
 Leeway (South) 5° (-)
 Course to steer 017° (T)
 Variation 24° W
 041° (M)
 Deviation 2° E
Compass course 039° (C) (15)
- 1.2 From A/C to anchorage 086° (T)
 Variation 24° W
 110° (M)
 Deviation 4° E
Compass course 106° (C)



(5)
 [20]

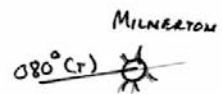
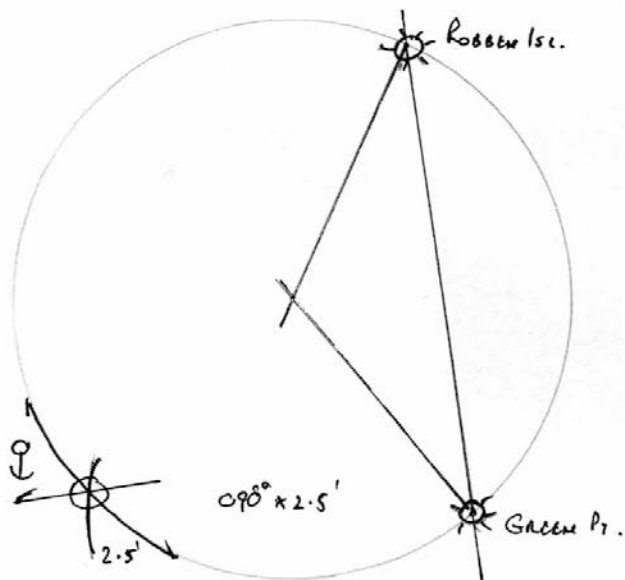
QUESTION 2

$$\begin{aligned} \text{Green Pt/Robben Isl } 90^\circ - 78^\circ &= 12^\circ \text{ brg } 358^\circ/178^\circ \\ \text{Brg from Robben Isl } 166^\circ + 12^\circ &= 178^\circ \\ \text{Brg from Green Pt } 346^\circ - 12^\circ &= 334^\circ \end{aligned}$$

$$\begin{aligned} \text{Distance fm Green Pt.} &= (\text{ht} \times 1,86) / \text{sext. Angle} \\ &= (20 \times 1,86) / 14,9 \\ &= 2,5 \text{ miles} \end{aligned}$$

$$\text{Milnerton Lt. brg} \quad 080^\circ \text{ (T)}$$

Anchor position Lat. 34° 54,0' S; Long. 018° 21,2' E



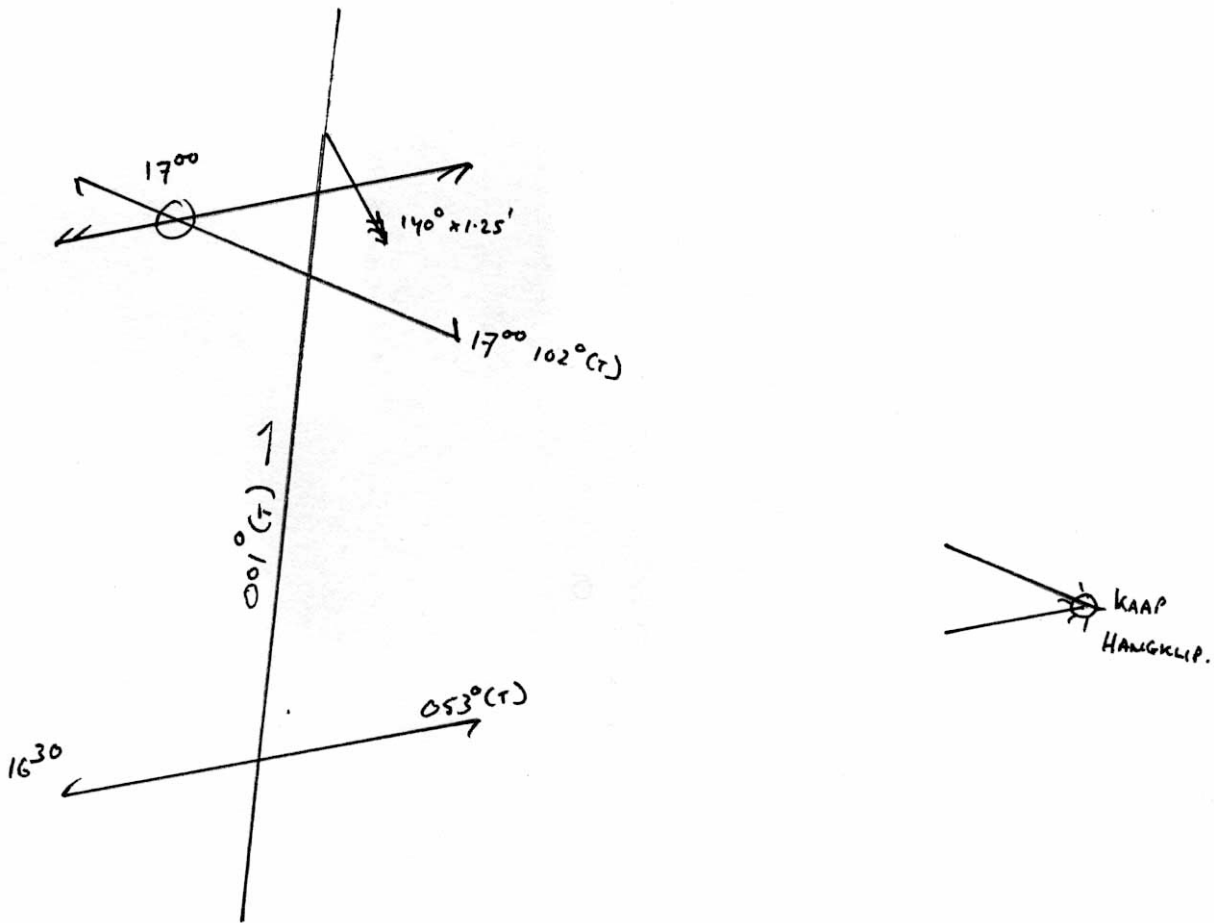
[20]

QUESTION 3

	Course	Brg at 16:30	Brg. at 17:00
Compass	018°	073°	122°
Dev	4° E	4° E	4° E
Magnetic	022°	077°	126°
Var	24° W	24° W	24° W
True	358°	053°	102°
Leeway W'ly	3° +		
Track	001° (T)		

Position at 17:00

Kaap Hangklip Lt brg 102° (T) x 7,8'
Lat 34° 21,5'S Long 018° 40,6' E



[20]

QUESTION 4

- 4.1 Draught = 4,2 m
 Clearance = 2,5
 Depth required = 6,7
 Chart depth = 5,4
 Height of tide = 1,3 m
- From the Tide Tables, cross at 07h 23m 1 December
 Steaming time from berth = 00h 45m
 Latest time to depart from the berth = 06h 28m 1 December (15)
- 4.2 The MHWS is the average over a year of the heights of two successive high waters during periods of 24 hours when the range of the tides is greatest. (5)
[20]

QUESTION 5

- 5.1 5.1.1 Flash green light every 2 seconds.
 Nominal visibility of 5 miles. (3)
- 5.1.2 White light, sequence 6 very quick flashes followed by one long flash at intervals of 10 seconds. (4)
- 5.1.3 White light, sequence 3 quick flashes at 10 second intervals.
 Sounding a bell. (3)
- 5.2 Cape Point will show a fixed red light. (5)
- 5.3 one nautical mile on either side. (3)
- 5.4 1 045 metres (2)
[20]

100 marks

QUESTION 6

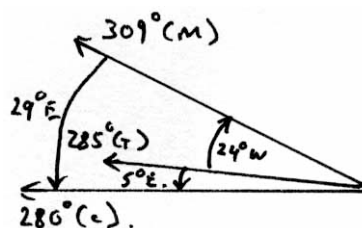
6.1	LMT sunset 20°S	17h 48m	
	Lat correction 6°S	<u>7</u>	-
	LMT sunset 26°S	17 41	
	Long. 11°E	<u>44</u>	-
	GMT sunset	<u>16 57</u>	
	Zone	<u>1 00</u>	+
	Zone time	<u>17 57</u>	

(8)

6.2	Dec 17:00 2 Dec	13° 27,1' N
	'd'	<u>0,8</u> -
	Dec 17:55	<u>13° 26,3' S</u>

$\text{Sin amp.} = \text{Sin Dec} / \text{Cos Lat}$
 $= \text{Sin } 13^\circ 26,3' / \text{Cos } 26^\circ$
 $= 0,259$
 Amp = W15°N

True brg.	285°
Compass brg	<u>280</u> °
Compass error	<u>5° E</u>



(11)

6.3	variation	<u>24° W</u>
	deviation	<u>29° E</u>

(3)

6.4	Compass course	145° (C)
	error	<u>5° E</u>
	True course	<u>150° (T)</u>

(3)

[25]

QUESTION 7

7.1 Chron = 08h 53m 23s GHA = 299° 04,0' Dec = 12° 54,9' N
 error (slow) = 00 00 45 + Inc 52m 38s = 013° 32,0' 'd' = .7' -
 GMT at obs. = 08 54 08 GHA = 312° 36,0' Dec = 12° 54,2' N
 Long E = 010° 05,0' +
 LHA = 322° 41,0'

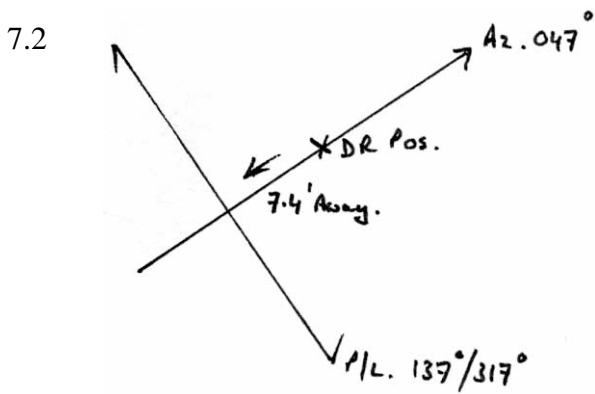
Sin θ° = Cos LHA x Cos Lat x Cos Dec \pm Sin Lat x Sin Dec
 = Cos 322° 41,0' x Cos 28° x Cos 12°54,2' - Sin 28° x Sin 12°54,2'
 = 0,68447 - 0,1048
 = 0,579
 θ° = 35° 25,6'

Sext Alt = 35° 23,7'
 Index error = 1,0'
 Obs. Alt = 35° 22,7'
 Dip (6,2m) = 4,4' -
 App. Alt. = 35° 18,3'
 Total error = 14,7' +
 True Alt. = 35° 33,0'
 Calc. Alt. = 35° 25,6'
 Intercept = 7,4' away

A = 0,689 N
 B = 0,370 N
 C = 1,059 N

Az. = N 47° E
 P/L = 137°/317°

(20)



(5)
 [25]

50 marks

Total: 150 marks