NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2018

NAUTICAL SCIENCE: PAPER I

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.

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SECTION A PRACTICAL CHART WORK

QUESTION 1

	Ship's Heading	Robben Isl. Lt. Bearing
Compass	132°	089°
Deviation	9° W	9° W
Magnetic	123°	080°
Variation	24° W	24° W
True	099°	056°

1.1	Course to make good	057° (T)	*See Chart SAN 3002*
	Course to counter the current	047° (T)	*See Chart SAN 3002*
	Leeway allowed (Wind W'ly)	2° -	
	Course to steer	045° (T)	
	Variation	24° W	
	Magnetic course to steer	069° (M)	
	Deviation	13° ½ W	
	Compass course to steer	**082° ½ (C)**	
1.2	Course from A/C to Pilot	**090° (T)**	*See Chart SAN 3002*
1.3	Dist. 05:00 to Pilot	11,0 M	
	Time @ 8 kts	01^h 22^m	
		05 00	
	ETA Pilot	**06 22**	

QUESTION 2

Simonsberg/Paulsberg brg.	347°/167°	
Base angle	90° – 63°	27°
Brg. from Simonsberg	167° – 27°	140°
Brg. from Paulsberg	347° + 27°	014°
Paulsberg/Cape Point Lt. brg.	336°/156°	
Base angle	90° – 56°	34°
Brg. from Cape Point Lt.	336° + 34°	010°
Brg. from Paulsberg	156° – 34°	122°

Chart work marks

Anchor position: **Lat. 34° 16,6'S Long. 018° 31,6'E**

or – **Whittle Rk buoy brg. 049° × 2,9'**

or – **Cape Point Lt. brg. 197° × 5,0'**

QUESTION 3

	V/l Hdg.	Brg. 16:30	Brg. 17:00
Compass	335° (C)	027° (C)	076° (C)
Deviation	4° E	4° E	4° E
Magnetic	339° (M)	031° (M)	080° (M)
Variation	24° W	24° W	24° W
True	315° (T)	007° (T)	056° (T)
Leeway (W'ly)	5° -		
Track (T)	320° (T)		

3.1 *Chartwork*

3.2 The vessel will pass 1 mile NE of the 29 m depth.

3.3 The 29 m depth will be abeam at 19:20

QUESTION 4

4.1

Draught	5,00
Clearance	0,50
Depth required	5,50
Chart depth	4,00
Height of tide required	1,50

The earliest time to cross on the afternoon rising tide will be at 13:00 on Wednesday 28 November.

4.2 Chart datum is an arbitrarily fixed level at a port devised so that it is below low tide level (except for very low tides). All predicted tidal heights for any port are heights above chart datum for that particular port. Chart datum will be different for each port.
(*or similar definition*)

4.3 (b) M.H.W.S.

QUESTION 5

5.1 Robben Island light will display the following characteristics:

- Occulting white light changing to red on its southern sector;
- The frequency is 7 seconds;
- Height is 47 metres above sea level;
- Nominal range of the white light is 24 miles, and of the red light 12 miles.

5.2 The safe passage past Whittle Rock is to the east.
The reason may be any one of the following:

- It is an East Cardinal buoy identified by the top marks and light frequency.
- The buoy is positioned to protect a shallow (breaks occasionally) patch of 3,6 m depth on the west side.

5.3 "Obsc" means obscure, and the dotted arc line adjacent denotes the arc of the circumference of Cape Point light which is obscured.

5.4 Variation for 1999 is 23° 32'W, increasing 2'W each year. Therefore the variation for 2014 will be 24° 02'W.
(*The answer may differ depending on the publication year of the chart, information will refer to the centre of the compass rose in False Bay*)

5.5 "Ships replenishing stores off Table Bay should remain to the westward of the lines running in the north-north-westerly and south-westerly directions from a point 6 nautical miles west of Green Point Light."

SECTION B ASTRO-NAVIGATION

QUESTION 6

6.1	LMT Mer. Pass. 1 Dec.		11^h 49'
	Long. 018° 10'E	-	1^h 13'
	(a) GMT Mer. Pass. 1 Dec.		10^h 36'
	Zone GMT	+1hr.	1^h 00,0'
	(b) Mer. Pass. Zone time		11^h 36'

6.2	Dec. at Mer. Pass.		S 21° 47,9'
	Sext. Alt.		80° 41,7'
	Index error	+	1,2'
	Observed altitude		80° 42.9'
	Dip	-	6,1'
	Apparent altitude		80° 36,8'
	Total correction	+	16,0'
	True altitude		80° 52,8'
			90° 00,0'
	Zenith distance ZX		9° 07,2'
	Declination QX	S	21° 47,9'
	Lat.	S	12° 40,7'
	Position at Mer. Pass.		12° 40,7'S 018° 10,0'E.

6.3	05:00 Lat.		13° 45,5'S
	11:36 Mer. Pass.		12° 40,7'S
	D'Lat.		1° 04,8'N
	Distance	miles	64,8 M
	Time	05:00 to 11:36	6,6 hrs
	Speed		9,8 kts

QUESTION 7

7.1	LMT	08^h 30 00		
	Long. 044° 20'E	03^h 00 00		
	GMT	05^h 30 00		
	GHA 05^h 00	257° 41,0	Dec.	S 21° 55,0
	Inc. 32^m 40^s	7° 30,0	'd'	0,2
	GHA 05^h 32 40	265^0 11,0	Dec.	S 21° 55,2
	Long.	044° 20,0		
	LHA	309° 31,0		
	A	0,42 N	True brg.	095° (T)
	B	0,52 S	Comp brg.	083° (C)
	C	0,10 S	Compass error	12° E
	T Brg.	S 85° E	Ship's Hdg.	250° (C)
	T. Brg.	095° (T)	**True Hdg.**	**262° (T)**
7.2	Compass error	12° E		
	Var.	23° E		
	Dev.	**11° W**		

Total: 150 marks

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