

B.Sc. (NAUTICAL SCIENCE)**Term-End Examination****June, 2008****BNA-021 : NAVIGATION III**

Time : 3 hours

Maximum Marks : 70

Note : All questions are **compulsory**. Use BA Chart No. 2675, (English Channel) for Chartwork problems. Use of non-programmable scientific calculator is allowed. Chart No. 2675 and Tidal Curve diagram/graph are to be provided by the institute.

SECTION A**(Navigation)**

1. On 30th April, 1992, in DR $00^{\circ} 20' N$, $60^{\circ} 12' W$, the Sextant Altitude of the Sun's UL East of the meridian was $44^{\circ} 13.4'$ when chron (error 03 m 09 s slow) showed 00 h 57 m 43 s. If HE was 20 m and IE was 3.1' off the arc, find the direction of the PL and the longitude where it crosses the DR latitude.

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2. In the evening of 22nd September 1992, a ship in DR Long 160° 12' W, found the sextant altitude of Polaris to be 36° 18.6' at 05 h 23 m 17 s chron time (error 02 m 09 s fast). If IE was 2.8' on the arc and HE was 10 m, find the direction of the PL and the Latitude where it cuts the DR Longitude.

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3. (a) With respect to the moon, explain any **two** of the following :

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(i) Conjunction

(ii) Opposition

(iii) Quadrature

(b) Why do stars rise, culminate and set 4 minutes earlier each day ?

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SECTION B

(Chart Work)

4. (a) At 1600 hrs., vertical sextant angle of Bill of Portland Lt. Ho. (145 feet or 44.2 m) was $00^{\circ} 20'$ and the bearing of the same light house was 000° (T). Find the ship's position. 5
- (b) From 1600 hrs. position as in 4(a) above, find the TRUE course to steer so as to pass Start Point 6 miles off, counteracting a current known to be setting 135° (T) at 2.5 knots and Leeway 3° , wind North. 5
- (c) While on above course, find the time and distance off when Berry Head Lt. will be abeam. (Variation 2° E, Engine Sped 10 knots, Index error $3'$ on the arc) 5
5. A vessel was steering 239° © at 12 Kts. While on above course at 0930 hrs. Lizard Pt. Lt. Ho. bore 321° © and at 1120 hrs. it bore 042° ©. During this period the current was known to be setting 307° (T) at 4 Kts. Find CMG, SMG and position of the ship at 1120 hrs. (Variation 6° W and Deviation 2.7° W) 10


6. Find the earliest time on 17th June, a vessel off BOSTON, drawing 3.4 metres will be able to cross a bar marked 2 metres, with a clearance of 1 metre under her keel. The extract from A.T.T. are given below :


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Extract from A.T.T.		
	TIME	HEIGHT
	0229	3.1 m
16	0848	-0.1 m
F	1508	2.9 m
	2109	0.2 m
	0325	3.0 m
17	0939	0.0 m
Sa	1601	2.8 m
	2205	0.3 m


7. Write the meaning of following chart symbols and your action in case vessel's course was laid over them :

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(i) 

(ii)  Wk

(iii) 

(iv) 

(v) 