DIPLOMA IN NAUTICAL SCIENCE

Term-End Examination

June, 2006

BNA-021 : NAVIGATION III

Time : 2 hours *Maximum Marks : 70*

Note : *All questions are **compulsory**. Use BA Chart No. 2675, English Channel for chartwork problems. Chart No. 2675 and Tidal Curve diagram/graph to be provided by the Institute.*

SECTION A

(Navigation)

1. On 1st December 1992 in DR 06° 35′ N, 064° 18′ W owing to a hazy horizon to the South, a back angle observation of the Sun's LL on the meridian was made and the sextant alt. was found to be 118° 11·8′. If HE was 14 m, and IE was 2·4′ on the arc, find the latitude and the direction of the PL. *10*

2. On 30th April 1992 PM at ship in DR 34° 18′ S, 40° 20′ W the obs. alt. of the star Sirius was 57° 50·7′ at 08 h 52 m 05 s chron. time. The chron. error 01 m 40 s fast at 06 GMT on 16th April, and its daily rate was 4 s losing. If HE was 21 m, find the direction of the PL and Position through which it passes. *15*

3. With respect to moon, explain the terms "Conjunction", "Opposition", "Quadrature". How often do they occur and what period of time separates them ? *10*

SECTION B
(Chart Work)

4. (a) At 1600 hrs. Vertical Sextant Angle of Bill of Portland Lt Ho (145 feet or 44·2 meters) was 00° 20′ and the bearing of the same Light House was 000° (T). Find the ship's position. (I.E. 3′ on the arc.) *5*

(b) From 1600 hrs. position, find the Compass Course to steer so as to pass Start point 6 miles off when abeam, counteracting a current known to be setting 135° (T) at 2·5 knots and Leeway 3°, wind north. (Variation 2° E, Deviation 0·5° E, Engine speed 10 kts.) *5*

(c) Find the time and distance off when Berry Head Light is abeam. *5*

5. A ship steering 260° (C) at 12 knots; At 0900 hrs. St. Catherine Lt. Bore $333\frac{1}{2}°$ (C) and at 0930 hrs. it bore $005\frac{1}{2}°$ (C) and at 1010 hrs. it bore $031\frac{1}{2}°$ (C); at the time of taking the third bearing Anvil Point Light Bore $305\frac{1}{2}°$ (C). Find the course made good, position at the time of second bearing, and the set and drift of the current between 0900 hrs. and 1010 hrs. (VAR = 6° W, DEV = 0·5° E) *10*

6. Given the following extracts from the Tide Table, find the standard time during the afternoon on 28th February at which there will be 5 m of water over a shoal patch where the chart shows 2 m sounding, off the port of Darwin (Australia). *10*

Extracts from Tide Table

	Time	Ht.
	0018	2·7 m
28 M	0557	6·2 m
	1223	1·5 m
	1832	7·0 m