

DIPLOMA IN NAUTICAL SCIENCE

Term-End Examination

June, 2007

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. Use of Non-programmable scientific calculator is allowed. Chart No. 2675 and Tidal curve diagram/graph to be provided by institute.

SECTION A

(Navigation)

1. On 29th Nov 1992 in DR $26^{\circ} 27' N$, $130^{\circ} 27' W$, the sextant altitude of the Sun's UL East of the meridian was $28^{\circ} 11.0'$ when Chronometer (error 01 m 31s fast) showed 05 h 49 m 20 s. If he was 12 m and IE was 2.4' off the arc, calculate the direction of the PL and a position through which it passes. 10
2. On 1st Sept 1992, AM at ship in DR $18^{\circ} 00' N$, $178^{\circ} 11' E$ the sextant altitude of the Pole Star was $18^{\circ} 47.4'$ at 05 h 21 m 08 s by Chronometer (error 01 m 18 s slow), HE was 12.5 m and IE 1.6' on the arc.

Find the direction of the PL and a position through which to draw it. If the azimuth was 002° (G), find the Gyro Error. 15

3. (a) Define any **two** of the following : 4

(i) True Altitude

(ii) Amplitude

(iii) Elongation

(b) Why do stars rise, culminate and set 4 minutes earlier each day ? 6

OR

Explain why Venus is visible in the mornings or evenings.

SECTION B
(Chart Work)

4. (a) At 1530 hrs while heading 200° (C) St. Catherine Point Lt Ho bore 315° (C) and NAB Tower bore 027° (C). Find the ship's position. 5
- (b) From the position obtained at 1530 hrs find a compass course to steer to pass Start Point Lt Ho 7 miles off, a current setting 155° (M) at 4 knots, Wind North, Leeway 3° . 5
- (c) Find the time when Bill of Portland Light will be abeam. (Engine Speed 13 knots) 5
5. A vessel while on a course of 100° (T) found Casquet Light to bear 200° (T) at 1900 hrs. If current was known to set 010° @2.5 knots, from 1900 hrs to 2100 hrs, find ship's position at 2100 hrs if at 2100 hrs Pte De Barfleur Light bore 125° (T). (Given Ship's Speed 13.0 knots) 10
6. Find the height of tide and depth of water at 1430 hrs on March 2nd at a position off Singapore, where charted depth is 4 metres. 10
- Extracts from the tide tables for the day are given below :

| Extracts from A.T.T. | |
|----------------------|--------|
| Zone Time - 0730 | |
| TIME | HEIGHT |
| 0014 | 2.7 m |
| 0603 | 0.8 m |
| 1209 | 2.9 m |
| 1830 | 0.6 m |