

DIPLOMA IN NAUTICAL SCIENCE

Term-End Examination

December, 2006

BNA-014 : NAVIGATION-I (TERRESTRIAL AND CELESTIAL)

Time : 2 hours

Maximum Marks : 70

Note : All questions are **compulsory**. Noories Tables and Nautical Almanac are allowed. Use Chart BA 813. Non-programmable scientific calculator is allowed.

SECTION I

1. Define the following : 5
- (i) True Course
 - (ii) Poles of the Earth
 - (iii) Cable
 - (iv) SHA of a Star
 - (v) Rational Horizon
2. A ship sails on a course of 144° (T) from latitude $15^\circ 40'$ N and makes a d'long of $47^\circ 50'$. Find the distance covered and the latitude reached. 10

3. (i) Find LHA of Star Deneb at 17 H 30 M 30 S IST on 13th September 1992 (Ship's posn 05° 07' N, 081° 30' E). 3
- (ii) Define Parallax in Altitude. 2
4. By using Mercator Sailing Formula find position arrived if a ship sailed on a course of 301° (T) for 1408 miles from 00° 04' S, 178° 20' W. 10
5. Sextant altitude of Sun's UL on 29th November 1992 at 17 H 47 M 49 S GMT was 28° 11'. Find its True Zenith Distance at this time. (HE = 10 meters, IE = 2·3' off the arc) 5

SECTION II

6. (a) Define the following : 6


- (i) True Bearing
- (ii) Chart Datum
- (iii) Gyro Compass Error

(b) What do the following chart symbols indicate : 4

(i)  WK

(ii) 

(iii) 

(iv) 

7. (i) Ship's course : 133° (C), Variation 6° W.
Find True Course using following deviation table : 2

Ship's head	Dev.
130° (C)	8.5° W
140° (C)	10.0° W
150° (C)	11.0° W

(ii) Vertical Sextant Angle of a light-house from a ship is $0^\circ 11'$ (IE : $0^\circ 1'$ on the arc). Find distance between ship and light-house if height of light-house is 43 meters. 3

- 8.** At 0900 hrs Weligama LT. HO. and Dondra Head LT. HO. were in transit bearing 288° (G) and at same time Dondra Head LT. HO. was 10 miles off. 10
- (i) Find ship's position at 0900 hrs and Gyro Error.
- (ii) From this position set a course by Gyro Compass to pass 7 miles off Great Basses Reef LT. HO. counteracting current which is setting 130° (T) at 3 KTS, wind N'LY with Leeway 4° .
(Ship's engine speed : 15 KTS)
- 9.** At 1500 hrs Colombo SBM bore 102° (C) (VAR : 13° W, DEV : 2° E) with a distance of 8 miles by radar. From this position vessel sailed on a course of 165° (C) (VAR : 13° W, DEV : 14° E) with engine speed of 15 KTS. Current was setting 220° (T) \times 3 KTS. 10
- (i) Find estimated position at 1700 hrs.
- (ii) Also find what time Barbaryn LT. HO. is estimated to be abeam, beam bearing when abeam and distance off.