

B.Sc. (NAUTICAL SCIENCE)**Term-End Examination****June, 2008****BNA-014 : NAVIGATION-I
(TERRESTRIAL AND CELESTIAL)**

Time : 3 hours

Maximum Marks : 70

Note : All questions are **compulsory**. Use Nories Tables, Burton's Tables and Nautical Almanac, where required. Use Chart BA 813. Non-programmable scientific calculator is allowed.

SECTION I

1. Define any **two** of the following : 5
- (a) Rhumb line
 - (b) First Point of Aries
 - (c) Rational Horizon
2. At 1000 Hrs. the DR position of a ship was $10^{\circ} 12' S$ $047^{\circ} 42' W$. At the same time a fix was obtained and found to be $10^{\circ} 04' S$ $047^{\circ} 57' W$. Find the set and drift of current. 10

3. On 2nd October a ship in position $02^{\circ} 10' N 66^{\circ} 09' E$ set courses as follows :

10

| Time | Comp. Co. | Error | Leeway | Wind | Log |
|------|---------------|---------------|-------------|------|-----|
| 1200 | 126° | $6^{\circ} E$ | 3° | SW | 0 |
| 2300 | 210° | $4^{\circ} E$ | 3° | SE | 168 |
| 0700 | 240° | $4^{\circ} E$ | NIL | W | 290 |

A current set the vessel $183^{\circ} (T)$ at 1.5 Kts throughout. Find EP at 1200 Hrs. on 3rd October when log showed 360.

4. On 28th November, AM at a ship in position $26^{\circ} 27' N 130^{\circ} 27' W$ the chronometer showed 06 h 46 m 20s. If at 0700 GMT on October 13th the chronometer was 00 m 15s fast and its daily rate was 03 sec losing, find the correct GMT of the observation. 5
5. The sextant altitude of Sun's UL on 29th November 1992 was $20^{\circ} 14.8'$. Find its True Zenith Distance at this time considering HE = 25 mtrs and IE $2.2'$ on the arc. 5

SECTION II

6. (a) Define the following : 6
- (i) Magnetic compass error
 - (ii) Compass bearing
 - (iii) Small scale chart
- (b) Differentiate between 4
- DR position and Estimated position

OR

Estimated position and Fix

7. The sextant altitude of the top of a lighthouse 42 mtrs above sea level is observed to be $00^{\circ} 36'$. Find the distance the observer is off from the lighthouse. 5
8. While on a course of 265° (C) and engine speed of 14 Kts, a vessel observed Great Basses Reef Lt. Ho. to bear 023° (C) at a distance of 20.5 miles at 0900 Hrs.
- (a) Find ship's position at 0900 Hrs.
 - (b) Vessel continued on above course, find estimated position at noon if current was estimated to set 145° (M) at 2.5 Kts, wind SE'ly, leeway 4° .
(Variation 4° W, Deviation 1° E) 10

9. At 1400 Hrs. vessel on course of 201° (C) and speed 12 Kts. observes Ratmalana Lt. bearing 140° (C). Same light was bearing 072° (C) at 1515 Hrs. Current setting 311° (T) at 3 Kts. Find the ship's position at 1400 Hrs. (Deviation 10° W, Variation 4° W)

10