

**B.Sc (NAUTICAL SCIENCE)**

**Term-End Examination**

**June, 2011**

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

*Time : 3 hours*

*Maximum Marks : 70*

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

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**SECTION - I**

1. Define the following with sketches wherever required : 5
  - (a) SHA Star
  - (b) Vertical circle.
  
2. Using Mercator sailing formula, find the position arrived if vessel sailed a course of  $301^{\circ}$  (T) for 1408 miles from position  $00^{\circ}0'4'S$   $178^{\circ}20'W$  10
  
3. Explain the procedure for calculating Gyro compass error by taking Amplitude of the sun. 5

4. On 24<sup>th</sup> Feb.1992, in DR position  $26^{\circ} 27' N$   $130^{\circ} 27' W$ , the sextant altitude of sun's UL was  $28^{\circ} 11.0'$  Find the true altitude and TZD of the sun at that time considering HE 10 m and IE was 2.3 off the arc. 5
5. Given GMT 1500, Longitude of observer is  $040^{\circ} W$  and LHA r  $100^{\circ}$ . Calculate RA of Mean Sun. 5
6. Find LHA of star SIRIUS at  $18^H 24^M 10^S$  GMT on 20<sup>th</sup> Jan 1992 at ship's DR position  $15^{\circ} 25' N$   $130^{\circ} 15' E$ . 5

## SECTION - II

7. Draw the following symbol used on chart : 7½
- (a) Lighted Oil Platform
  - (b) Fishing Stakes
  - (c) Rock not dangerous to surface navigation
  - (d) Wreck over which depth is 10.5m, dangerous to surface navigation.
  - (e) Temple.

8. Calculate as indicated :

- (a) Given Magnetic course  $300^\circ$  (M) and  $1\frac{1}{2}$  Dev  $8^\circ$  E. Calculate the compass course.
- (b) Given True course  $310^\circ$  (T) Variation  $6^\circ$  E  $1\frac{1}{2}$  Calculate the Magnetic course.
- (c) If the ship's head by compass  $045^\circ$  (C) find 2 the true course if var is  $5^\circ$  W and Dev as per Deviation card
- (d) If the ship's head by compass was 2  $058^\circ$  (C) , find the true course if var is  $3^\circ$  W and Dev as per card.

SHIP'S HEAD	DEV
$030^\circ$	$3.5^\circ$ E
$040^\circ$	$2.0^\circ$ E
$050^\circ$	$1.0^\circ$ E
$060^\circ$	$0.5^\circ$ W

9. (a) At 0800 was ship's position was found with point De Galle Lt Ho bearing  $080^\circ$  (T) distance 11 miles off, find the true course to steer so as to pass Colombo Lt. Ho 8 miles off when a beam counteracting current setting  $285^\circ$  (T) at 2.5 knots. 8½
- (b) Find the time and distance off when Barbery Lt Ho. will be a beam (speed 13 Knots) 4
10. Ship while steering course  $100^\circ$  (T), Dondra Hd Lt. Ho. bore  $065^\circ$  (T) at 2100 hrs and same light Ho bore  $301^\circ$  (T) at 2200 hrs. During this time vessel experienced current setting  $040^\circ$  (T) at 2.5 knots. Find the position of ship at 2100 and 2200 hrs. 8
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