

**B.Sc. (NAUTICAL SCIENCE)**

**Term-End Examination**

**June, 2014**

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

*Time : 3 hours*

*Maximum Marks : 70*

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- Note :**
- (i) *All questions are compulsory.*
  - (ii) *Use of Nories Table, Burton's Table and Nautical Almanac is permitted.*
  - (iii) *Use of non programmable scientific calculator is permitted.*
  - (iv) *Use B.A. chart 813.*
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1. Define the following : 5
  - (a) Great circle
  - (b) Nautical mile
  - (c) GHA
  - (d) SHA
  - (e) Zenith
  
2. Using Mercator sailing formula, find the position arrived, if a vessel sailed on a course of  $241^{\circ}(T)$  for 1897 miles from position  $36^{\circ} 48' N 085^{\circ} 53' W$ . 10
  
3. On 5<sup>th</sup> March 1992, the Sextant Altitude of sun's Lower Limb was  $35^{\circ} 59.1'$ , if I.E. was  $2.1'$  on the arc and H.E. was 22 m, find the True Altitude of the sun. 5

4. (a) Explain DR position and Estimated position. 5  
 (b) Explain Zone Time and Standard Time.
  
5. (a) Define and explain the use of International Date Line. 5  
 (b) Discuss Advancing and Retarding ship's clocks, while a vessel is proceeding on Easterly and Westerly Courses.
  
6. Find LHA of Star SiRius at 19<sup>h</sup> 22<sup>m</sup> 28<sup>s</sup> GMT on 14<sup>th</sup> June 1992 at ship in DR position 19° 30'N 084°37'E. 5
  
7. Sketch Symbols for the following : 5  
 (a) Wreck of which Mast is visible at chart Datum  
 (b) Single Point Mooring  
 (c) Wreck over which depth is 10.5 m, dangerous to surface navigation  
 (d) Rock awash at chart Datum  
 (e) Lighted Oil Platform
  
8. (a) Given the Ship's Head by Compass 263°(C), Var. 3° E, Dev. 7° W. Find the True Course. 2  
 (b) Find the compass course to steer, if the True Course was 235°(T), Var. 2° East, Dev. 1° East. 2  
 (c) Differentiate between "Mercator Charts" and "Gnomonic Charts". 4  
 (d) Differentiate between "Position" and a "Position Line". 2

9. Ship while Steering Course  $100^{\circ}(T)$ , Dondrattd. Light House 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 HRS and 2200 HRS. 10
10. At 0800 HRS, ship's position was found with point De Galle Lt. House bearing  $080^{\circ}(T)$  and distance 11 miles off. Find the True Course to steer so as to pass Colombo Lt. Ho. 8 miles off counteracting a current setting  $285^{\circ}(T)$  at 2.5 knots. 10
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