

00316

B.Sc. (NAUTICAL SCIENCE)

Term-End Examination

June, 2013

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

Time : 3 hours

Maximum Marks : 70

*Note : All questions are **compulsory**. Use of Nories/Burtons tables and 1992 Nautical Almanac is **permitted**. Non programmable scientific calculator is **permitted**. Use BA chart 813.*

SECTION-I

1. Define with sketches where required : 10
- (a) Dip
 - (b) Sensible Horizon
 - (c) Refraction
 - (d) Zenith
 - (e) D'lat
2. A vessel departed from 6°12' N 075°12' E. She 5
sailed on a course of 160° (T) at a speed of
15 kts. Find her position after 24 hours.

3. (a) Find the LHA of Jupiter on 28 April 1992 at $10^{\text{H}} 22^{\text{m}} 30^{\text{s}}$ IST in position $15^{\circ} 20' \text{ N}$ $072^{\circ} 42' \text{ E}$. 3
- (b) Given Departure Latitude $15^{\circ} 10' \text{ N}$ Mean Latitude $01^{\circ} 05' \text{ S}$ Find the latitude arrived. 2
4. Find the true altitude and Zenith Distance of Sun on 4 May 1992. Given sextant altitude of Sun's L.L $70^{\circ} 12'$ HE 15 m & IE $0^{\circ} 1'$ on the arc. 5
5. On 22nd Aug 1992 in Lat $15^{\circ} 10' \text{ N}$ Long $35^{\circ} 00' \text{ E}$, the sun rose bearing 080° (G) . Find the Gyro error. 5
6. Draw a figure on observer's Rational Horizon. Given observer's Latitude 20° S Long $060^{\circ} 00' \text{ W}$, Declination of the body $10^{\circ} 00' \text{ N}$ Azimuth 040° (T) . 5

SECTION-II

7. Define : 2+2+1
- (a) Natural Scale of a Chart
 - (b) Dead Reckoning position
 - (c) Variation
8. Draw symbols for the following : 10
- (a) Wreck depth unknown, considered dangerous for surface navigation
 - (b) Submarine cable
 - (c) Flood tide stream 3 knots
 - (d) Pilot boarding area
 - (e) Anchorage area
9. At 1000 hours Point De Galle Light House was bearing $050^{\circ}(T)$ and then vessel sailed a course of $100^{\circ}(T)$ for one hour at a speed of 13 knots. At this time the same Light House bore $333^{\circ}(T)$. Find the ship's position at 1100 hours. 8
10. At 0800 hours Vertical sextants angle of Dondra Head light House was observed to be $0^{\circ} 08'$ and its bearing was $315^{\circ}(T)$. Find the ship's position at 0800 hrs. 7

11. (a) At 0600 hours Ratnamala light House was bearing $030^\circ(T)$ and Barberyn Light House was bearing $122^\circ(T)$. Find the ship's position at 0600 hrs. 3
- (b) From this position find the true course to steer to pass point De Gaulle Light House 15 miles off when a beam. 2
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