

INDIAN MARITIME UNIVERSITY
(A Central University, Government of India)

May/ June 2017 End Semester Examinations
Diploma in Nautical Science- Second Semester
(AY 2012- 2015 batches only)

Navigation III- (UD11T2201)

(Terrestrial, Coastal and Celestial Navigation)

Date : 15.06.2017

Maximum Marks: 70

Time: 3 Hrs

Pass Marks : 35

Note:- Use of Non-programmable Scientific calculator, Norie's Table and Nautical Almanac are permitted.
Tidal graph and relevant chart to be provided by the Exam Centre.
All questions carry equal marks.

Section – A
(Attempt any 4 questions)

1. On 21st Jan 1992, in DR 24° 36'S 110° 20'W, the sextant altitude of the Sun's LL on the meridian was 85° 03.0'. If the IE was 2.6' off the arc and HE was 9 mtrs, find the latitude and the direction of the PL. (10 Marks)
2. On 1st Dec 1992, longitude 065° 33.7'E, the sextant altitude of the Pole star was 23°19.5' at GMT 01d 01h 03m 32s. If the IE was 3.0' on the arc & HE was 20 mtrs, find the direction of position line and the position through it passes. (10 Marks)
3. Find the great circle distance and initial course between: (10 Marks)
A - 06°N 079°W and B - 38°S 175° E
4. On 30th April 1992 PM, in DR 12° 37'N 179° 12'W the sextant altitude of the Sun's UL was 31° 18'.

GMT was 03h 59m 24s on 1st May. If the IE was 3.2' on the arc and HE was 18.7 mtrs, find direction of the PL and the longitude where it crosses the DR Lat. (10 Marks)

5. a) With neat diagram explain Lunar eclipse and conditions that causes Lunar eclipse. (4 Marks)
- b) Why is it necessary on ship to advance and retard clocks during its voyage. (3 Marks)
- c) Explain Kepler's laws of planetary motion. (3 Marks)

Section – B
(Attempt any 3 questions)

6. At 1900 from a ship at anchor, following compass bearings were observed: -
- a) Needles Lt. Ho. 329° (C)
- b) St. Catherine Lt. Ho. 001° (C)
- c) Nab Tower 041° (C)
- Find the position of the ship at 1900 hrs and the deviation for the ship's head, if Variation was 1° West.
(Use Principle of Horizontal Sextant Angle) (10 Marks)

7. From a ship steaming at 15 knots, steering a course of 075° (T), Pte. de Barfleur Lt. Ho. Bore 117° (T) at 2100 hrs. At 2200 hrs the same light bore 189° (T). Find the position of the ship at 2100 hrs and 2200hrs, if the current experienced was setting 035° (T) at 3 Knots. (10 Marks)

8. Find the time in the afternoon of 1st Sept., at which there will be 7 mtrs of water on a shoal patch off Boston where chart shows 3 mtrs sounding.
Extract from the Tide Table for the day are as follows: - (10 Marks)

| | Time | Height |
|-----------------------|------|--------|
| | 0558 | 6.8 |
| 1 st Sept. | 1153 | 2.5 |
| | 1813 | 6.3 |

9. a) List the publications required for planning passage across Atlantic Ocean from New York to Rotterdam.
- b) What are the advantages of Electronic chart over paper chart.
- c) Describe following IALA buoys:
- i) Isolated Danger marking buoy ii) Safe Water marking buoy
- iii) Port hand buoy Region B (10 Marks)
