

INDIAN MARITIME UNIVERSITY
(A Central University Government of India)
END SEMESTER EXAMINATIONS- JUNE/JULY 2019
DIPLOMA IN NAUTICAL SCIENCE
Semester: II
NAVIGATION III - TERRESTRIAL, COASTAL AND CELESTIAL
NAVIGATION
(UD11T2201)

Date: 24.06.2019

Max. Marks: 70

Time: 3 hours

Pass Marks: 35

Notes:

- All Questions are compulsory
- Use of Non-Programmable Scientific Calculators, Nories Tables, Selected Pages from Nautical Almanac 1992 is permitted
- Tidal graph (ATT3) and 'English Channel' Chart to be provided by the Exam Centre

Section A: TERRESTRIAL & CELESTIAL NAVIGATION

1. (a) State Kepler's first & second law and illustrate them by neat sketches
- (b) Describe with the help of sketches – Total & Partial Solar Eclipses
(5 x 2 = 10 marks)

2. Write short notes : **(2 x 5 = 10 marks)**
 - (a) Azimuth of a Celestial body
 - (b) Geographical Position of a Celestial body
 - (c) Prime Vertical & Principal Vertical
 - (d) Polar Distance
 - (e) Spring Equinox in North Hemisphere

3. (a) Find the Initial course and Great Circle distance from position A (30°N, 135°E) to position B (30°N, 120°W) **(5 marks)**

- (b) On GMT 29th November 1992 17h 22m 26s, in DR Long 178°11'E, the sextant altitude of Pole star was 17°18'. If the Index Error was 1.3' off the arc and HE was 24m, find the direction of LOP and a position through which to draw it. **(5 marks)**

4. On 22nd Sept 1992, PM at Ship in DR 30°00'N, 60°00'W, the sextant altitude of the Sun's LL was 19°04.9' when the GPS clock showed 20h 09m 38s. If the Index Error was 2.2' on the arc and HE was 30m, find the direction of LOP and the longitude where it cuts the DR latitude.

(10 marks)

Section B: CHART WORK

5. (a) List 10 Nautical Publications that are required to prepare a "PASSAGE PLAN". **(5 Marks)**

(b) What are the advantages of ELECTRONIC NAVIGATIONAL CHARTS over Conventional Paper Charts. **(5 Marks)**

6. A ship steering $074^{\circ}(G)$ in the English Channel. Pte de Barfleur light bore $117^{\circ}(G)$. After one hour's steaming at 15 knots, the same light bore $188^{\circ}(G)$. Find the ship's position at the time of taking first and second bearing, if the current during the above period was setting $035^{\circ}(T)$ at 3 knots. G.E. 1° Low **(10 Marks)**

7. Draw and explain characteristics (Colour, Shape and light) of following buoys: **(5 Marks)**

- i) South Cardinal buoy
- ii) Isolated Danger marking buoy

8. Find the height of tide and depth of water at 1430 hrs standard time on 2nd March at Position off Singapore. Depth at chart datum is 4.0 mtrs. Extracts from Tide tables for day under reference are as under:
Zone Time -0800

Time	Height
0014	2.7m
0603	0.8 m
1209	2.9m
1830	0.6m

(5 Marks)
