INDIAN MARITIME UNIVERSITY

(A Central University, Government of India)

END SEMESTER EXAMINATIONS – JUNE 2019

B.Sc (Nautical Science)

Semester-V

Celestial Navigation Paper- II

(UG21T3503)

Date:12-07-2019 **Maximum Marks:** 70

Time: 3Hrs **Pass Marks:** 35

Note: Question No. 1 is compulsory.

Answer any 6 questions from remaining 8 questions (each of 10 marks).

Use of Non-Programmable Scientific Calculator is permitted if required.

Use of Nautical Almanac 2008, Noorie's Nautical Tables is permitted.

Q.1 Write Short notes on following: (2 x 5 =10 marks)

(a) Staggered Observations

(b) Equation of Time

(c) Theoretical Sunrise

(d) Circumpolar Bodies

(e) Local Apparent Time

Q2. (a) Using Nautical Almanac 2008, find out the following details with respect to star Kochab: Approximate SHA (round off to nearest degree); Approximate Declination (round off to nearest degree); Allotted Number; Stellar Magnitude; Constellation of star Kochab. (5 marks)

(b) Compare the relative brightness of a stars A (Stellar Magnitude 2.1) & Star B (Stellar Magnitude 0.5) (5 marks)

Q3. (a)(i) Define Azimuth (ii).Define Amplitude. (5 marks)

(b) Explain the Concept of International Date Line. (5 marks)

Q4. (a) Explain the difference between Azimuth & Amplitude. (5 marks)

(b) Derive the formulae: Sin (Amplitude) = Sin (Declination) x Sec. (Latitude) (5 marks)

Q5. On 2nd Sept 2008, in DR 40° 28'N 64° 20'E, the rising Sun bore 090°(C). If variation was 5°W, find the deviation of the compass. (10 marks)

Q6. On GMT April 30th 2008 – 17h 30m 30s, in DR Longitude 150°E, the observed altitude of Polaris was 50° 46.8' bearing 005°(C). HE=14m, Var=1°E. Find the

deviation of the compass, the direction of the LOP and a position through which to draw it. (10 marks)

Q.7. On GMT January 19th, 2008 – 03h 48m 00s, in DR 40° 16'S 175° 31'E, the sextant altitude of the Sun's LL was 43° 27.4'. If HE=22m and IE = 1.5' on the arc, find the direction of LOP and the longitude where it cuts the DR Latitude. (10 marks)

Q8. On GMT March 4th, 2008 – 23h 14m 44s, in DR 27° 18'N 168° 11'W, the sextant altitude of the Sun's LL near the meridian was 56° 19.8'. HE = 12m and IE =2.8' on the arc. Find the direction of the LOP and a position through which it passes. (10 marks)

Q.9. (a) Explain Twilight. State the condition for 'Twilight all Night'. (5 marks)

(b) The true altitude of a star at upper meridian passage and lower meridian passage were 63° 54' and 16° 50' respectively, to an observer in the northern hemisphere. At both transits, the star bore north. Find his latitude and the declination of the star. (5 marks)
