INDIAN MARITIME UNIVERSITY

(A Central University, Government of India)

END SEMESTER EXAMINATIONS –DECEMBER 2018

B.Sc (Nautical Science)

Semester-V

Celestial Navigation Paper- II

UG21T3503

Date: 31.12.2018 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 in 20 words: (maximum) (2 x 5 =10 marks)

(a) Stellar Magnitude

(b) Equation of Time

(c) Theoretical Sunrise

(d) Twilight

(e) International Date Line

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

(b) Compare the relative brightness of a star A (Stellar Magnitude 4) & Star B (Stellar Magnitude 6) (5 marks)

Q3. Explain with suitable diagram, the system of Zone time in respect of advancing and retarding clocks for time keeping at Sea on board ship. (10 marks)

Q4. (a) Define Amplitude & explain its significance with respect to navigation at sea. (5 marks)

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

Q5. Jan 20th, 2008, in DR 54° 20'S 46° 27'W, the Sun set bearing 234°(C). If variation was 3°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 Circumpolar bodies. State the condition for a celestial body to be circumpolar. (5 marks)

(b) Given Latitude as 32°11′N and declination as 69° 36′N, draw an appropriate sketch and compute the meridian altitudes above & below the pole. (5 marks)

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