INDIAN MARITIME UNIVERSITY

(A Central University, Government of India)

December 2017 End Semester Examinations

B.Sc. (Nautical Science) -

Semester III

Celestial Navigation – Paper I

Subject Code: UG21T3301

Date: 04.12.2017 Maximum Marks : 70

Time: 3 Hrs. Pass Marks : 35

Note: - 1) Part A is compulsory.
2) Part B: Attempt any FIVE out of 8 questions.
3) Selected pages of Nautical Almanac, 2008 to be used.
4) Use of non-programmable Scientific Calculator is permitted.

Part- A

(Question No. 1 is compulsory)

1) Write short notes on following: (2x5=10 marks)

A) Zenith

B) Equinoctial

C) Winter Solstice

D) SHA

E) Astronomical Position Circle

Part- B

(Attempt any FIVE out of 8 questions)

2) Write Short Notes on following:

A) Obliquity of the Ecliptic (3 marks)

B) Prime Vertical Circle (3 marks)

C) International Date Line (3 marks)

D) Superior Planets (3 marks)

3) Discuss Kepler Laws of Planetary motion. (12 marks)

4) Explain Solar Eclipse. Elaborate with diagram the conditions required for occurrence of different types of solar eclipse. (12 marks)

5) Explain the significance of following with respect to Earth & Sun:

A) Tropic of Cancer (3 marks)

B) Tropic of Capricorn (3 marks)

C) Arctic Circle (3 marks)

D) Antarctic Circle (3 marks)

6) A) With reference to diagram on the plane of rational horizon prove that:
Altitude of Elevated pole = Latitude of the Observer (6 marks)

B) Explain Waxing & Waning with respect to phases of Moon. (6 marks)

7) Solve the following numerical: (4x3 =12marks)

A) GHA = 098° 29.6′ ; Longitude = 121° 17.4′ W ; Find LHA

B) LHA = 349° 53.2′ ; Longitude = 079° 16.8′ W ; Find GHA

C) GHA = 179° 14.8′ ; LHA = 200° 12.9′ ; Find Longitude

D) GMT= 18d 16h 10m 30s; LMT= 18d 10h 07m 50s; Find Longitude

8) A) Explain the difference between Standard Time & Local Mean Time.

(6 marks)

B) On 14th Sep. 2008, the sextant altitude of Sun's upper limb was 70° 29.8′. If Index error was 3.2′ off the arc and Height of Eye was 14 meters, find the true altitude. (6 marks)

9) On 1st Dec 2008, in DR 06° 35′N 64° 18′W, an observation of Sun's LL on the meridian was made and the sextant altitude was found to be 61° 27.5′. If HE was 14m, and the IE was 2.4′ on the arc, find the latitude and direction of the LOP. (12 marks)

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