INDIAN MARITIME UNIVERSITY

(A Central University Government of India)

END SEMESTER EXAMINATIONS-JUNE/JULY 2019

B.SC NAUTICAL SCIENCE

SEMESTER-III

NAVIGATION PAPER – III

(CELESTIAL NAVIGATION AND VOYAGE PLANNING)

(UG21T2306)

Date: 06-07-2019 **Maximum Marks: 70**

Duration: 3 hrs. **Pass Marks: 35**

Note:
Answer any SEVEN questions. All Questions carry equal marks.
Use of Noorie's table, Nautical Almanac & Non-Programmable Scientific Calculator Permitted.

1. Define the following: (2x5=10 marks)

   a) Prime Vertical
   b) Right Ascension
   c) Zenith
   d) Declination
   e) Elevated Pole

2. Explain the following:

   a) 'd' Correction of celestial bodies. (5 marks)
   b) Standard Time (5 marks)

3. Solve the following numerical:

   a) On 29th Nov 2008 in DR 34º34'N; 130º 27'W at GMT time 29d 17h 47m 49s, find the LHA of Sun. (5 marks)

   b) GMT=18d 16h 10m 30s; LMT=18d 10h 07m 50s; Find Longitude (3 marks)

   c) GHA = 098° 29.6'; Longitude = 121° 17.4' W; Find LHA (Support your answer with relevant diagram) (2 marks)

4. 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. (10 marks)

5. 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. (10 marks)

6. Explain (with relevant diagram), the daily apparent motion of a celestial body. (10 marks)

7. Explain in reference to Marine Sextant: (4+3+3=10 marks)

   a) Parallax
   b) Refraction
   c) True Altitude

8. a) Draw a diagram of Celestial Sphere and mark the following:

   Celestial Poles, Equinoctial, Ecliptic, First Point of Aries (4 marks)

   b) Explain (with diagrams) the relationship between GHA, LHA & Longitude.

   (6 marks)

9. Explain the four elements of Passage Planning. (10 marks)

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