Indian Maritime University

(A Central University, Govt of India)

Supplementary Examinations - March / April - 2024

Programme Name: B Sc (NS)

Semester: 3

Subject Code: UG21T5301

Subject Name: Celestial Navigation I

Date: 23.03.2024	Max Marks: 70
Duration: 03 Hrs	Pass Marks: 35

General Instructions

(i) All Sections (A, B & C) are to be attempted and All the Questions are Compulsory.

(ii) Use of 2008 Nautical Almanac, Norrie's Table Scientific Calculator is permitted.

Section A
Objective Type Questions (10 x 1 Mark = 10 Marks)

1. In a Rational Horizon diagram, which of the following does Prime Vertical Not pass through?

   a. East b. North c. Zenith d. West

2. What is the radius of Celestial Sphere?

   a. 100 nm b. 1000 nm c. 1 Light Year d. Infinity

3. Which of the following planets is an INFERIOR planet?

   a. Mercury b. Mars c. Jupiter d. Saturn

4. What is the value of eccentricity of earth's orbit around the Sun?

   a. Zero b. 0.0167 c. 1.000 d. 23.5

5. Which of the following Sextant Altitude correction is applicable to the Star's altitude?

   a. Refraction b. Parallax c. Semi-Diameter d. None of the above.

6. Due to the effect of Terrestrial Refraction, distance of Visible Horizon is LESS than Geographical Horizon. True / False.

7. For an Observer in Southern Hemisphere, Depressed Pole is North Pole. True / False.

8. If Latitude of an observer is same value and name as the Declination of celestial body, the body would be at Observers Zenith at Upper Meridian Passage the body. True / False
9. What is the assumed hourly rate of change of Moons Hour Angle in increment table of Almanac?
   a. 10 Deg 30 min b. 14 Deg 19 Min c. 15 Deg 00 Min d. 15 Deg 30 Min

10. In Nautical Almanac, how frequently is 'v' corn for Moon given?
   a. Once in 3 Days b. Once in 2 Days c. One per day d. Every Hour

Section B

SHORT ANSWER TYPE QUESTIONS (5 x 02 Marks = 10 Marks)

11. State Kepler's 2nd Law of Planetary Motion. Draw a neat sketch supporting it.

12. Calculate the True Zenith Dist for Mars on 18th Jan 2008 if App Alt of Mars is 20 Deg 40 Min.

13. What is Rational Horizon?

14. What is the Elevated Pole? Describe with the help of a neat sketch for Northern Hemisphere.

15. Find LHA of Star Rigel on 16th Jan 2008 at 12H 45M 32S UTC for an observer in Long 20 Deg E.

Section C

Answer all the questions. (5x10 Marks = 50marks)

16. Describe the Celestial Sphere and Equinoctial system of coordinates with the help of a neatly labelled sketch. (10 Marks)

17. a. Describe the earths elliptical orbit and state approximate aphelion and perihelion distance and date. (5 Marks)
   b. Describe the significance of tropic of Cancer and Capricorn. (5 Marks)

18. a. List conditions necessary for occurrence of Solar Eclipse. Draw a sketch to show Solar Eclipse. (5 Marks)
   b. Determine Geographical Position of Moon on 09th Oct 2008 / 19H 40M 24S GMT. (5 Marks)

19. (a) Define Dip & Refraction and explain in brief their causes on Sextant Altitude Corrections. (5 marks)

(b) For an observer in DR 45°30'N,148° 45'W LMT of a celestial observation was 20 42 54 on15 Jun08. What is the GMT of observation? (5 marks)

20. On 16 June 2008 in DR position 72^0 30′ N 038^0 45′ E, the sextant altitude of the lower limb of the sun during meridian passage was 40^0 38.6′, IE 1.4′ Off the arc, height of eye was 8.3 meters. Find the Latitude of the observer and the direction of the position line.

(10 marks)

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