Indian Maritime University

(A Central University, Govt of India)

End Semester Examinations – December 2024

Programme Name: B Sc (NS)

Semester: III

Subject Code: UG21T5301

Subject Name: Celestial Navigation Paper-I

Date: 06.12.2024	Max Marks: 70
Duration: 03 Hrs	Pass Marks: 35

(i) All Sections (A, B & C) are to be attempted.
(ii) Options are specified in respective section.

Section A 10 question 1 mark each

1. Azimuth & Altitude of a celestial body is known as ---------

2. 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

3. LHA of a Celestial body would be 180° when the body is on the observer's ------

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

5. An Inferior planet can never be in ---------

6. Duration of Daylight/darkness over a place depends upon ---------

7. Azimuth of a cel. body on the Observer's Prime vertical circle(East) would be ------

8. Sidereal Period of moon is ---------

9. What is the value of eccentricity of earth's orbit around the Sun?
   a. Zero b. 0.0167 c. 1.000 d. 23.5

10. Observer on earth, within the divided umbra shadow will experience ----------

Section B Five Questions of 02 Marks each

11. Find the GP of SUN on 19th JAN.2008 @ 1030Hr. GMT

12. Find the GMT if the Sun is over the meridian of an observer at 67°30'W

13. Explain kepler's 2nd law of planetary motion.

14. Show by a neat diagram that if the declination of sun is 0° then latitude of an Observer is equivalent to the meridional zenith distance of the sun.

15. Why does clocks needs to retarded / advanced on board ship?

Section C

Seven Questions of 10 Marks each of which any 05 questions to be answered. (both Part A & B of questions carry 5 marks each)

16.

A) Draw a neat diagram of Celestial sphere & show the following

- Declination of a Celestial body (North)

-Equinoctial

-Ecliptic & first point of aires

-Celestial Poles

-Celestial meridian of the body

B) Explain 'Equinoctial' & 'Horizontal' Co-ordinate system of describing a celestial body.

17.

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

18.

A) Find the LHA ♈ , If GHA ♈ = 185° 36′ & Long of an Observer is 175° 24′E; Also find the LHA of a star if at that time, the SHA of Star is 225° 30′.

B) Explain Zone Time . A ship is in 139°30'E and sailing easterly direction. Find the time on board ship would be If the time then is 0930hr.GMT

19.

A) Show by a diagram True Altitude = Apparent altitude + parallax in altitude

B) On 5th May 2008, the sextant Alt. of the Sun's Upper limb was 56° 11.4'. If the Index error of the sextant was 2.8' off the arc & the height of eye was 12m, find the True Alt. & TZD.

20.

A) Explain briefly upper Meridian passage of a celestial body.

B) On 1st May. 2008, in DR 179° 58'E, the observed Altitude of the sun's LL on the meridian was 65° 35.9' South of the observer .If HE was 25m, find the latitude & state the direction of the LOP.

21.Show the following on the plane of ORH 10 marks

Lat. Of Obs. = 45°N Decl. of CB = 15° N & Az = S45°E .If the Altitude of the CB is then 55° , Complete the Δ PZX. Identify & measure its sides.

22.What would be the GP of the Sun on 1st Dec.2008 when the Sun is on the meridian of an observer at 18° 45´N/ 115° 45´W? 10 marks