

Indian Maritime University
(A Central University, Govt of India)

Mar/Apr'26 SE

Programme Name: B Sc (NS)

Semester: 4

Subject Code: UG21T5401

Subject Name: Celestial Navigation Paper-II

Date: 02.04.2026

Max Marks: 70

Duration: 03 Hrs

Pass Marks: 35

General Instructions

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

Section A

Ten MCQs/Fill in the Blanks of 01 Mark each – Choose the correct answer as applicable.

1. Betelgeuse and Bellatrix are stars in constellation
 - a. Cygnus
 - b. Orion
 - c. Scorpius
 - d. Lyra
2. Sidereal day is Shorter than solar day.
 - a. 4min
 - b. 3min
 - c. 3min 56sec
 - d. 4min 4 sec
3. Equation of time is the angle difference between
 - a. Mean sun and Dynamical mean sun
 - b. Mean sun and True sun
 - c. True sun and Dynamical mean sun
 - d. None
4. When apparent sun's UL is at the horizon the actually the sun would be
 - a. 16' below horizon
 - b. 34' above horizon
 - c. 50' above horizon

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- d. 50' below horizon
5. For an observer at 178deg 16' W if LMT sunrise given in almanac is 06h 22min. What would be GMT time at sunrise?
- a. 18h 15m 04s
b. 18h 28m 56s
c. 18h 15m 56s
d. 18h 28m 04s
6. IF CB lies East of the observer's meridian LHA of the CB would be
- a. = 180deg
b. > 180deg
c. < 180deg
d. = 0deg
7. For celestial observations select the most appropriate statement
- a. LOP would be E-W
b. LOP would be perpendicular to Azimuth
c. LOP would be same as Azimuth
d. LOP would be at 45deg to Azimuth
8. For the month of Nov, while observing Sun's UL for sight calculation, if apparent alt = $28^{\circ} 07.7'$, what would be the True altitude?
- a. $27^{\circ} 49.9'$
b. $26^{\circ} 49.9'$
c. $29^{\circ} 07.7'$
d. $38^{\circ} 07.7'$
9. Observed lat is the outcome in following celestial observations
- a. Lat. By meridian altitude
b. Polaris
c. Ex-Meridian
d. All of the above
10. Nautical twilight is when sun is between And degrees below horizon
- a. 6, 12
b. 0, 6
c. 12, 18
d. None

Section B

Five Questions of 02 Marks each

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11. Define LHA and LST?
 12. What is IDL and give its relevance in time keeping at sea?
 13. Explain why True sun is not suitable for Time keeping?
 14. Justify the statement 'Celestial PL is actually a small arc of position circle'?
 15. Define 'Circumpolar body'?

Section C

Five Questions of 10 Marks each.

16. Explain following:
 - a. Why do stars rise/set 4min earlier each day as compared to the Sun? (5 Marks)
 - b. Altitude of Polaris = Latitude of observer. (5 Marks)
17. Explain how celestial bodies will be visible for observer at Pole, Equator and at Intermediate latitude?
18. Vessel in position $04^{\circ} 21' N$ $019^{\circ} 51' W$, at GMT 10h 33m on 30th Nov 2008, the sext alt of Sun's UL – East of the meridian is $44^{\circ} 21'$; IE 0.8' OFF; HE 18.1m. Find the direction of the PL and the position through which it passes.
19. (a) Define Twilights- civil, nautical and astronomical. 6 marks
(b) Explain conditions necessary for twilight all night? 4 marks
20. Solve following:
 - a. Find the latitudes within which an observer would have twilight throughout the night, when the sun's decl is $20^{\circ} N$ 5 Marks
 - b. On 23rd Aug 2008 vessel in DR $43^{\circ} 09' N$ $158^{\circ} 21' E$ the rising sun bore $069^{\circ} (C)$. If variation was $1.8^{\circ} W$, find the deviation of the compass.

5 Marks

