

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

Sep/Oct'25 SE

Programme Name: DNS

Semester: 2

Subject Code: UD11T6204

Subject Name: CELESTIAL NAVIGATION

Date: 12.09.2025

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. The Zenith distance is an arc of ----- passing through the body
2. Ship's time is -----, if she sails on easterly direction.
 - a. Advanced
 - b. Retarded
 - c. Maintained as it is
3. The constellation of Orion can be identified by searching for
 - a. Betelgeuse and Rigel
 - b. Schedar and Navi
 - c. Acrux and Gacrux
 - d. Rigel Kentaurus
4. GHA of a celestial body is 100° . Its LHA is 165° . Longitude of the observer is -

5. The length of 1 Astronomical unit is

- e. 95 Million Kilometres
- f. 100 Million kilometres
- g. 150 Million Kilometres
- h. 93 Million Kilometres

6. A straight line from the stars Dubhe and Merak point towards_____

7. At the time of meridian passage, azimuth of celestial body is:

- a) Always 000
- b) Always 180
- c) Always 090
- d) 000 or 180.

8. Parallel of 66.5° S refers to-----

9. The maximum declination of the Moon varies between 18.4° to 28.6° degrees

- a) True
- b) False

10. Which of the following are inferior planets:

- a) Mars and Saturn
- b) Jupiter and Venus
- c) Mercury and Venus
- d) Neptune and Uranus

Section B

Five Questions of 02 Marks each

11. Calculate the GP of Rasalhague on 21st July 2008 at GMT 05H 40M 30S.

12. Define Zenith and Rational Horizon.

13. Define Amplitude of a celestial body and its relationship with Rising / setting azimuth.

14. State the conditions needed to be fulfilled for a body to be Circumpolar.

15. What causes Index error in sextant and how do you find Index error in sextant by Horizon method.

Section C

Five Questions of 10 Marks each.

16. An observer obtains the meridian altitude of a body as follows: above the Pole $88^\circ 00'$ to the south and below the pole $10^\circ 15'$ to the North.

Calculate the Latitude and Declination. Draw a neat diagram to show your understanding. **(10 marks)**

17. On 31 Aug 2008 GMT 17h 22m 26s, ship in DR $18^\circ 00' N$ $178^\circ 11' E$, the sextant altitude of the Pole star was $18^\circ 47.4'$. HE = 12.5 m and IE = 1.6' on the

arc. Find the direction of LOP and a position through which to draw it. If the azimuth was 001° (C), and variation was 1.3° E, find the deviation for that compass course. **(10 Marks)**

18. On 2nd May 2008, in DR $40^{\circ} 36' N$ $179^{\circ} 49' E$ the observed altitude of Sun's lower limb on the meridian was $64^{\circ} 35.9'$ South of the observer. If IE was $0.2'$ on the arc and HE was 15 meters, find out latitude and LOP. Draw a neat diagram to show your understanding. **(10 Marks)**

19. On 01 May 2008, in DR longitude $179^{\circ} 58' E$, the Sextant altitude of the Sun's LL on the meridian was $64^{\circ} 34.9'$ South of observer. Index error $1'$ off the arc and HE = 15m, find the latitude and state the direction of the LOP. **(10 Marks)**

20. On 6th March 2008 at 0200 Hrs GMT in DR Long $72^{\circ} 51' E$, the Sextant altitude of Polaris was $37^{\circ} 33'$. If IE was $2.1'$ off the arc and the HE was 17m, find the direction of the LOP and the position through which it passes. If the star bore 001° Gyro, calculate the Gyro error. **(10 Marks)**

