

Indian Maritime University
(A Central University, Govt of India)
Supplementary Examinations – September/October 2024
Programme Name: B Sc (NS)
Semester: IV
Subject Code: UG21T5401
Subject Name: Celestial Navigation II

Date: 25.09.2024

Max Marks: 70

Duration: 03 Hrs

Pass Marks: 35

General Instructions

- (i) All Sections (A, B & C) and all the questions are compulsory.
- (ii) 2008 Nautical Almanac & Norrie's Nautical Table permitted.
- (iii) Scientific Calculators permitted.

Section A

Ten MCQs/Fill in the Blanks – Choose the correct answer as applicable. Answer all the questions

(10x1mark=10 marks)

1. What is the correct sequence of twilights in the morning leading to Sunrise?
 - a. Astronomical, Nautical, Civil, Sunrise
 - b. Civil, Nautical, Astronomical, Sunrise
 - c. Sunrise, Astronomical, Nautical, Civil
 - d. Sunrise, Civil, Nautical, Astronomical

2. How many Meridian passage will a Circumpolar body have?
 - a. 1
 - b. 2
 - c. 3
 - d. 4

3. ZX of the celestial spherical triangle PZX corresponds to _____.
 - a. Declination of body
 - b. Latitude of Observer
 - c. Co-Latitude of Observer
 - d. Zenith Distance of body

4. Rising Amplitude of Sun is E 09 N. What is the true bearing of Sun?
 - a. 089°T
 - b. 081°T
 - c. 099°T
 - d. 009°T

5. At Perihelion, Earth is _____ to the Sun in its orbit.
 - a. Farthest
 - b. Closest
 - c. Halfway
 - d. Quarter

6. Line joining Centre of the Earth and Centre of the Celestial Body pass through _____ on the surface of the Earth

- a. GP of CB b. Ship' Position c. Both d. None

7. SHA is the _____ hour angle measured from First Point of Aries to the celestial meridian passing through the celestial body?

- a. Northerly b. Easterly c. Westerly d. Southerly

8. Azimuth is the angle at the _____?

- a. Elevated Pole b. Depressed Pole c. Equator d. Zenith

9. Meridian passage time of a star is about 4m early each day because

- a) SHA of star changes 4m each day
b) Stars are far away
c) GHA of a star increases at a rate $< 15^\circ/\text{hr}$.
d) Solar day is longer than sidereal day by about 4m.

10. 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

Section B

Answer all Five Questions (5 x 2 marks= 10 marks)

11. What is Equation of time(ET)?

12. Find the SHA and Declination of the star DUBHE on 29th Nov 2008?

13. What is a Circumpolar Body?

14. Define LHA and LST?

15. Calculate the Sunrise time in GMT for an observer in DR 20°N , 165°E on 12th Oct 2008.

Section C

Answer all Five Questions (5 x 10 marks = 50 marks)

16.(a) What is Zone Time and Standard Time? 5 marks
(b) Explain Geographical Position. 5 marks

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

'ON' the arc. Find the direction of the LOP and a position through which to draw it? 10 marks

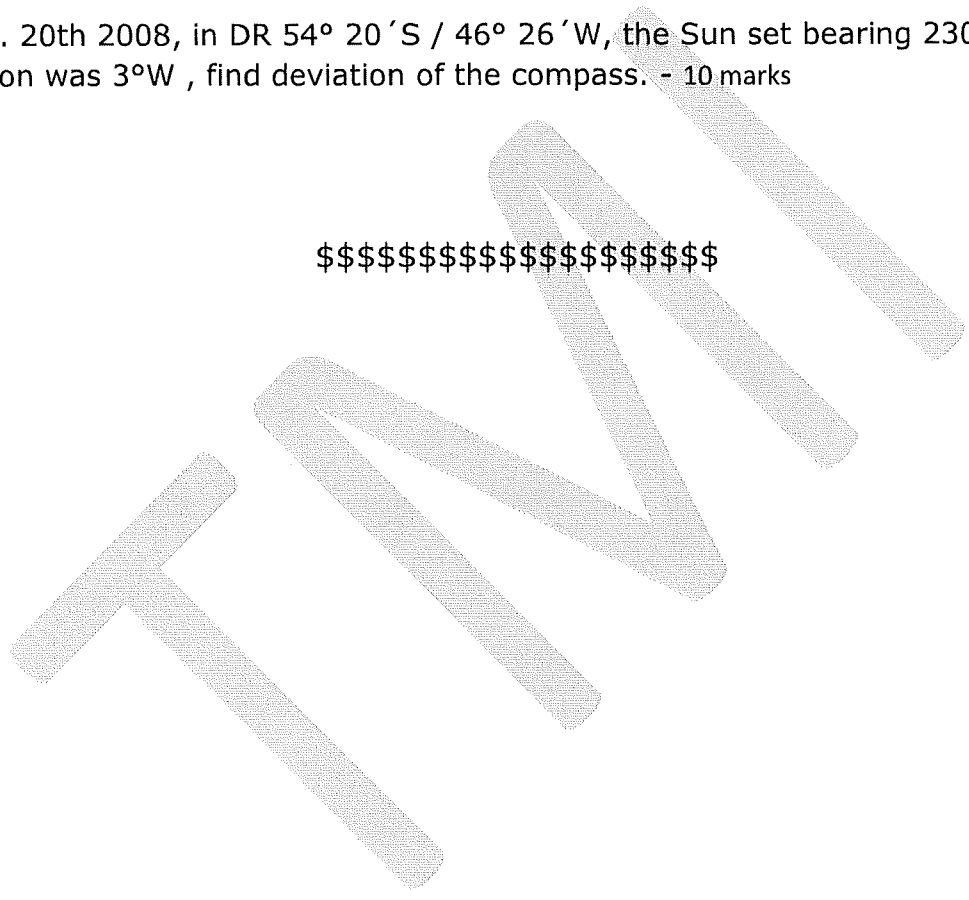
18. On 29th Nov 2008 in DR $26^{\circ}27'N$ $130^{\circ}27'W$, the sextant altitude of the Sun's UL East of the meridian was $28^{\circ}11'$, when the GMT 17h 47m 49s. If HE was 10m and IE was 2.3' off the arc, calculate the direction of the LOP and the intercept? 10 marks

19. (a) Define Twilights- civil, nautical and astronomical. Support your answer with neat sketch? 6 marks

(b) Explain conditions necessary for twilight all night? 4 marks

20. Jan. 20th 2008, in DR $54^{\circ}20'S$ / $46^{\circ}26'W$, the Sun set bearing $230^{\circ}(C)$. If variation was $3^{\circ}W$, find deviation of the compass. - 10 marks

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