EXDR5678

Indian Maritime University

(A Central University, Govt of India)

Sep/Oct'25 SE

Programme Name: B Sc (NS)

Semester: FOURTH

Subject Code: UG21T5401

Subject Name: Celestial Navigation Paper-II

Date: 10.10.2025	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.
(iii) Norrie's Table, Nautical Almanac (2008) and Graph Sheet is to be provided.
(iv) Scientific Calculator (Non-Programmable) is to be allowed.

Section A

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

1. Star with apparent magnitude of 5 is ..... times brighter than star with magnitude of 7
   a. 2.512
   b. 6.31
   c. 100
   d. 2.5
2. LST is measured in ..... Direction from the Meridian of .....
   a. Westward, First point of Aries
   b. Eastward, Observer
   c. Westward, Observer
   d. Eastward, First point of Aries
3. What is the exact duration of the sidereal day?
   a. 23h 56m
   b. 23h 56m 4s
   c. 23h 56m 4.1s
   d. 23h
4. In a single day of 24 Hrs how many Amplitude observations can be taken?

a. 1
b. 2
c. 3
d. 4

5. Rational Horizon will ..... Bisect Equinoctial
   a. Always
   b. Some times
   c. Never
   d. None of the above
6. In Azimuth calculation, Sign of A should be.....
   a. Same as latitude when LHA is between 270^0 and 090^0
   b. Opposite to latitude when LHA is between 0 and 180
   c. Opposite to latitude when LHA is between 90 and 270
   d. Same as latitude when LHA is between 90 and 270
7. Circle of Equal altitude is also Circle of Equal ZD?
   a. True
   b. False
8. Ex-Meridian observations is taken when CB is
   a. On observer's meridian
   b. Close East of observer's meridian
   c. Close West of observer's meridian
   d. Both b and c
9. Simultaneous observation is method of plotting two celestial PLs taken
   a. At Interval of 1 min
   b. At zero interval of time between the two
   c. At interval of 2min
   d. At any time, interval suitable to plot it on chart.
10. 10. An observer will observe any CB as circumpolar when it's
   a. UMP is within the Rational Horizon
   b. UMP is outside the Rational Horizon
   c. LMP is outside the Rational Horizon
   d. LMP is within the Rational Horizon

Section B

Five Questions of 02 Marks each

11. What is an Apparent Magnitude? Give two examples.
12. What is IDL? How ship's clocks are adjusted when crossing this?
13. Explain how celestial bodies of different declination will be visible to an observer at South Pole?
14. Find out LMT Sunrise On 5^{th} March 2008, in DR 32^0 30'S 178^0 16'E"
15. Write down conditions necessary for twilight all night?

Section C

Answer all Five Questions of 10 Marks each.

16.

a. Vessel in DR position 35deg 21' N 027deg 48'W on 01st May 2008, The Rising Sun bore 075deg (C). If variation was 5deg W, Find the Deviation of the Compass? (5 Marks)

b. Derive Amplitude formula? (5 Marks)

17. Vessel in position 31deg 18'S 142deg 24'W, at GMT 19h 39m on 05th March 2008, Sext Alt of Sun's UL – East of the meridian is 51deg 57'; IE 2.4' OFF the Arc; HE 12.4m. Find the direction of the Position Line and the Longitude through which it passes? (10 Marks)

18. In DR 24deg 48'N 179deg 55.4'E, find the position of the ship from the following two observations: - (10 Marks)
    a. Obs long 179deg 59'W Az 030deg
    b. Int 1.0' Tow Az 330deg

19. Explain with simple Rational Horizon Diagram that Altitude of Polaris = Latitude of Observer? (10 Marks)

20. Explain Briefly the following
    a) 'Twilight' (5 Marks)
    b) 'Circumpolar Bodies'? (5 Marks)

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