

Indian Maritime University
(A Central University, Govt. of India)
End Semester Examinations – June 2023
Programme Name: DNS Semester: Second
Subject Code: UD11T5201

Subject Name: NAVIGATION III: NAVIGATION & CHARTWORK

Date: 31.05.2023

Max Marks: 70

Duration: 03 Hrs.

Pass Marks: 35

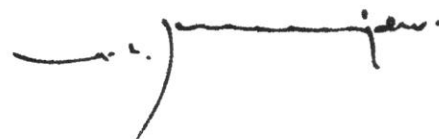
General Instructions

- (i) All Sections (A, B & C) are to be attempted. All the questions are compulsory.
- (ii) Use BA Chart 2675 or INT 5049 (English Channel) for Chart work.
- (iii) Norrie's Tables, Nautical Almanac permitted.
- (iv) Non-programmable Scientific calculators permitted.
- (v) Exam Centres to provide 'Luminous Range Diagram' and 'Tide Curve Diagram' (from ATT 3) to candidates as applicable.

Section A (All Questions are Compulsory)

Choose the correct answer (10 x 1 mark = 10 marks)

1. Inferior planets cannot come in _____ with the Sun.
a. Superior Conjunction
b. Opposition
c. Inferior Conjunction
d. All of these
2. Unequal distribution of days & nights on earth is primarily due to ____
a. Latitude of the place.
b. Declination of the Sun.
c. Topography of the place
d. Both a) & b).
3. In the PZX triangle side PX or Polar Dist. is always ____
a. 90° - Declination
b. 90° - Lat
c. 90° + or - Declination
d. True Zenith Distance.
4. To know about the standard time of a Port an OOW should consult the ____
a. ALRS Vol-3
b. ALRS Vol-2
c. ALRS Vol-5
d. Ocean Passages of the World
5. Spring tides are experienced when the Sun and the Moon are in ____
a. Conjunction
b. Quadrature
c. Opposition
d. Both a) & c)
6. Three Mandatory sensor inputs to ECDIS are ____
a. GPS, Echo sounder & Speed Log
b. GPS, Gyro & Speed Log
c. GPS, Gyro & BNWAS
d. GPS, AIS & Gyro.
7. GHA Aries (+/-) Long (+/-) SHA Star will yield:
a. GHA Star
b. LHA Star
c. LHA Aries
d. Declination of Star
8. ENCs have 3 types of objects, they are ____
a. Point, Line & Depth.
b. Line, Area & Depth.
c. Area, Contour & Depth.
d. Point, Line & Area.



9. The earth is farthest to the sun at

- a. Perigee
- b. Apogee
- c. Perihelion
- d. Aphelion

10. Drying height is measured from

- a. Mean high water spring
- b. Mean sea level
- c. Chart datum
- d. Highest Astronomical tide

Section B (All questions are Compulsory)

Answer the following questions.

(5 x 2 marks = 10 Marks)

11. Calculate the GP in the following case: Celestial Body Sun

Date 4th March 2008 and GMT 23h 14m 44s

12. Find the Longitude if GHA Sun = $345^{\circ}24'$ & LHA Sun = $00^{\circ}00'$.

13. Draw a figure on the plane of the Rational Horizon (Elevate Pole Diagram) with observer at 30° N. Complete the PZX triangle with a star having an approx. declination = 10° S and LHA = 040°

14. Expand the Light Characteristics: L fl (G) 10s 21 m 15 M.

15. Define Amplitude of a celestial body.

Section C (All questions are Compulsory)

Answer the following questions.

(5 x 10 marks = 50 Marks)

16. Calculate the GC distance and Initial course from San Francisco (38° N,

123° W) to Tokyo Bay (35° N, 140° E).

(10 Marks)

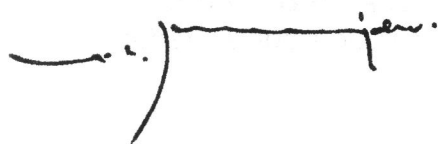
17. On 19th Jan 2008, PM at Ship in DR $40^{\circ}16'S$ $175^{\circ}31'E$, the sextant Altitude of the Sun's LL was $43^{\circ}27.4'$ when the GMT was 03h 48m 00s. If HE = 22m and the IE = 1.5' ON the Arc, find the direction of the LOP and the Observed Longitude.

(10 Marks)

18.

a. On 5th March 2008 in Position $32^{\circ}12'N$, $178^{\circ}16'E$, the Rising Sun was found bearing 099° (G). Find the error of the Gyro Compass. **(5mark)**

b. Explain the Monitoring stage of Passage planning **(5 marks)**



19. From a vessel steering 102° (T) at 0100 hrs. Pte de Barfleur Lt. bore 151° (T). One hour later i.e. at 0200 hrs, same light bore 242° (T). During the time the current was known to be setting 080° (T) at 3 knots. Find the ship's position at 0200 hrs. and at 0100 hours (Ship's speed 12 knots). **(10 Marks)**
20. Find the height of tide off Singapore harbour at 1100 hours. On 21st June 2021. The following extracts from the tide tables for the date under reference are given below Extract from A.T.T. Zone Time -0730 **(10 Marks)**

TIME	HEIGHT
0123	2.7m
0703	0.9m
1302	2.9m
1930	0.5m

(Handwritten signature)