

**Indian Maritime University**  
**(A Central University, Govt of India)**  
**End Semester Examinations – June 2023**

**Programme Name: DNS**

**Semester: One**

**Subject Code: UD11T5104**

**Subject Name: NAVIGATION I: Navigation and Chartwork**

**Date: 26.06.2023**

**Max Marks: 70**

**Duration: 03 Hrs**

**Pass Marks: 35**

**General Instructions**

- (i) All Sections (A, B & C) are to be attempted.
- (ii) All the questions are compulsory.
- (iii) Non-Programmable Scientific Calculator is permitted.
- (iv) Use of Norrie's Table, Nautical Almanac permitted.
- (v) Chart 813 – South Coast of Sri Lanka will be issued by the respective College / institute.

**SECTION A**

**Answer all the questions (10 x 1 mark = 10 marks)**

Fill in the Blanks / True or False / MCQ as applicable

- 1 IALA full form is .....
- 2 ..... is caused by ships magnetic field.
- 3 Chart datum is depth at the ..... tide.
- 4 Straight line on a Gnomonic Chart is a.....
- 5 A parallel of latitude is a ..... circle
- 6 Mercator charts are normally made for latitudes higher than 70° (True / False)
- 7 Beam bearing = Ships' heading +/- 90° (True / False)
- 8 To correct compass course, Easterly error is to be added ( True / False)
- 9 Suez Canal connects Red sea with
  - a. Black Sea
  - b. b. Baltic Sea
  - c. c. Arabian Sea
  - d. d. Mediterranean Sea
10. Acronym of ECDIS is
  - a. Electronic Chart Display Innovation System
  - b. Electronic Chart Digital Immigration System
  - c. Electronic Chart Display Information System

*[Handwritten signature]*

d. Electronic Chart Display Informal System

**SECTION B**

**Answer all the questions (5 x 2 marks = 10 marks)**

11. Describe First point of Aries
12. Describe Isolated Danger Mark and its light.
13. Explain Departure
14. Describe Dead Reckoning Position
15. Enlist at least two disadvantages of a Mercator chart.

**SECTION C**

**Answer all the Question ( 5 x 10 marks = 50 marks)**

16. a) Draw the plane sailing triangle & label all the parts and write down Associated formulae. **(5 Marks)**  
b) Calculate the position arrived. Start position:  $44^{\circ} 12' N$   $177^{\circ} 43' E$ ,  
Co  $138^{\circ} (T)$  distance 555 miles. **(5 Marks)**
17. a) Find position arrived and distance steamed using Mercator Sailing  
Formula: From:  $39^{\circ} 18.4' N$   $155^{\circ} 18' W$  Co:  $238^{\circ}(T)$ , D'Long:  $20^{\circ}$   
**(5 Marks)**  
b) State the Difference between ENC & RNC chart. **(5 Marks)**
18. Vessel heading course  $270^{\circ} (C)$  speed 13 kts at 0900 hrs observed Dondra Head Light  $320^{\circ} (C)$  & Radar distance of 15 miles.  
a) Find vessel's position at 0900 hrs. Thereafter vessel intend to pass Galle Light off by 15 miles.  
b) find when Galle light will be abeam?  
(Deviation  $3^{\circ} E$ , variation from the chart & round off to whole degrees).  
**(10 Marks)**
19. (a) A vessel steams  $040^{\circ} T$  for 2300 miles from position  $39^{\circ} 37' S$ .  
 $47^{\circ} 28' W$ . Find the arrival position. **( 5 marks)**

(b) The transit Bearing of beacons in the channel on chart is  $162 - 342$  degrees, the ship was on Gyro heading of  $163$  degrees when beacons were seen in transit. A light house was abeam to port at the same time, what was the True Bearing of the light house at that time. All steps to be shown. **( 5 marks)**

20.

(a) On 16<sup>th</sup> March 2008, Sextant Altitude of Sun's Lower Limb was  $56^{\circ}11.4'$ . If Index Error of sextant is  $2.8'$  off the arc and height of eye was  $12\text{m}$ , find True Altitude. All steps to be shown. **( 5 marks)**

(b) Define GHA and LHA of a celestial body. **(5 marks)**

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