

Indian Maritime University
(A Central University, Govt of India)
End Semester Examinations – December 2023
Programme Name: DNS
Semester: I
Subject Code: UD11T5104
Subject Name: NAVIGATION & CHARWORK

Date: 22.12.2023

Max Marks: 70

Duration: 03 Hours

Pass Marks: 35

General Instructions

- (i) All Sections (A, B & C) are to be attempted.
- (ii) Scientific Calculator is permitted.
- (iii) Use of Norrie's Table, Nautical Almanac permitted.
- (iv) Chart no. 813 – South Coast of Sri Lanka will be issued by the respective Institute.

Section A

Choose the correct answer

(1 mark each)

1. A parallel of latitude is a circle (Great / Small)
2. Suez Canal connects Red sea with... (Black sea/ Mediterranean/ Gulf of Aden)
3. In Parallel sailing formula departure= Distance. (T/F)
4. Mercator charts are normally made for latitudes higher than 70° (T/F)
5. Leeway is allowed to correct the set due to current (T/F)
6. Obliquity of the ecliptic is (an angle/ circle/ straight line)
7. _____ between two places is the east west distance travelled along the parallel of latitude.
8. Shape of the earth is an _____
9. Angular distance between True North and Compass North is known _____
10. D'Long is measured as the arc of the _____.

Section B

Short answer type questions (2 marks each)

11. With a simple sketch show Difference of latitude and difference of longitude.
12. Describe of ENC's in an ECDIS.
13. List two disadvantages of a Mercator chart
14. Compass course 359° , Variation 4.5° W, deviation 2° E. Find true course.
15. Describe Dead Reckoning and Estimated position.

Section C

Answer all the questions.

16. **(2 x 5 = 10 Marks)**
- a. Find Course and distance between
P: $36^\circ 11.7' N$, $075^\circ 12.6' E$ & Q: $40^\circ 18.6' N$ $080^\circ 11.5' E$
 - b. Two vessels on parallel of latitude of $44^\circ N$ are 200 miles apart. Both steam due south at 10 knots. How far are they after 1 day.
17. **(3 + 7 = 10 Marks)**
- a. Compare Mercator Sailing with Plane sailing.
 - b. A ship sails from $11^\circ 36' S$ $176^\circ 54' W$ to $06^\circ 18' N$ $138^\circ 18' W$. Find the course and distance using Mercator Sailing.
18. **(5 + 5 = 10 Marks)**
- a. On the 28th of May 2008, the sextant altitude of Sun's lower limb was $38^\circ 11.6'$. Index error was $2.8'$ off the arc and HE was 12.3 m. Find the true zenith distance (TZD).
 - b. Write a short note on Mercator and Gnomonic projections
19. **(2 x 5 Marks)**
- a. Explain the objective behind WEND Principle as promoted by IHO
 - b. Explain the terms ENC and RNC
20. **(4+3+3 = 10 Marks)**
- a. At 1000 hrs Dondra Head Light and Hindel Nattu Peak (410) were in transit, and the same time Dondra Head Light was 12' miles off by radar. Find the vessel position.
 - b. Find True Course to steer to pass Great Basses Reef Light house 5' miles off to port side.
 - c. Also find at what time Great Basses Reef Light House will be abeam and distance off. (Ship's speed 12 knots).