

INDIAN MARITIME UNIVERSITY
(A Central University, Government of India)
May-June 2018 End Semester Examinations
Diploma in Nautical Science (DNS)

Semester : I

NAVIGATION – I: TERRESTRIAL & CELESTIAL (UD11T 3104)

Date: 07-06-2018

Maximum Marks : 70

Time: 3 Hrs

Pass Marks : 35

**Note: Use BA Chart 813 (South Coast of Sri Lanka) for Chart work.
Use of Selected pages of Nautical Almanac 2008, Norie's
Tables and Non-programmable type scientific calculator is
allowed in Exam Hall.
Draw Sketches wherever required.**

Section A: TERRESTRIAL & CELESTIAL NAVIGATION

Note: Q. No. 1 & 2 are compulsory. Answer any 2 out of remaining 3 questions.

1. Define the following: (1x5=5 marks)
 - a) Knot
 - b) Prime Meridian
 - c) Departure
 - d) Deviation
 - e) Leeway

2. a) Write Short notes on 'Difference in Meridional Parts' (DMP). (3 marks)

b) Find by Mercator Sailing, the position arrived on sailing from position 38° 18'S 005° 11'W on a course of 124°(T) for a distance of 3256 Miles. (7 marks)

3. a) Explain 'Rhumb line' and its usefulness in navigation. (4 marks)

b) On 20th Feb 2008, the sextant altitude of the Sun's lower limb was 56° 11.4'. If the index error of the sextant was 2.8' on the arc and the height of eye was 20m, find the True Zenith distance. (6 marks)

4. On 14th Sep. a ship in position 40°12'N 76°46'W steamed as follows:

Time	Co (C)	Deviation	Variation	Speed
1200 (14 th)	249°	3°W	6°W	16 kts
1600	287°	2°E	6°W	14 kts
2200	349°	4°W	5°W	14 kts
0600	273°	2°E	5°W	15 kts
1200 (15 th)	289°	3°E	4°W	16 kts

An estimated current was setting at 027° (T) at 2 kts throughout the day. Find the estimated position on 15th Noon. (10 marks)

5. a) Draw a Celestial Sphere and label the following: (5marks)
 Celestial Poles; Any one Celestial Meridian; Any One Declination Circle; Equinoctial; Ecliptic.
- b) A ship sailed from A 44°44'S 154° 30'E to B 44°44'S 179°50'E. Find the course and distance steamed. (5marks)

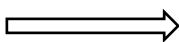
Section B: CHART WORK (Chart No. BA 813)

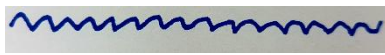
Note: Q. No. 6 is compulsory and carries 5 marks. Attempt any 3 out of the remaining four, they carry 10 marks each.

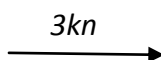
6. Identify the following Symbols and Abbreviations: (1x5=5 marks)

a. *PD*

b. MHWS

c. 

d. 

e. 

7. Write Short Notes on: (2 marks x 5=10 marks)

- Natural Scale of a Chart
- Estimated Position
- Transit Bearing
- Plan Charts
- Admiralty Chart Catalogue

8. At 0500 hrs, a ship on the course of 030° (C) observed 'Great Basses Reef' [Fl.15s34m25M] bore 265° (C) & 'Little Basses Reef' [VQ(2)10s34m27M] bore 005° (C) at the same time.

(a) Find the ship's position at 0500 hrs. (Variation 3° W);

Extract of Deviation card of the ship:

Ships Heading by Compass	Deviation
10°	4° W
20°	3° W
30°	2° W
40°	1° W

(b) The Vessel continued the course of 030° (C) at the speed of 15kts. Find the bearing & distance off when 'Sangma Kanda Point' [Fl5s10M] will be abeam on the Port Side. (Variation 3° W)

(c) Find the time when 'Sangma Kanda Point' [Fl5s10M] will be abeam. (10 marks)

9. At 1400 hrs, a ship observed Barbery Light [Fl.20s.46m27M] bearing 050° (T). The vessel was steering a course of 156° (T) at 11.5 knots. At 1600 hrs the Point De Galle Light [Fl.(2)15s28m25M] was observed bearing 090° (T).

(a) Find the vessel position at 1600 hrs.

(b) Find the vessel position at 1400 hrs.

(10 marks)

10. A ship observed 'Nilewelli Point' (approx. position $05^\circ 57.5'N$ $081^\circ 43'E$) and 'Kolonna Point' (approx. position $05^\circ 58.5'N$ $081^\circ 44'E$) in transit bearing 060° (C) & at the same time 'Dondra Head' [Fl.5s47m28M] was 9 miles off from the ship .

(a) Find the position of the ship.

(b) Find the Compass error & the deviation of the ships head if the variation was 3° W. (10 marks)

End