

INDIAN MARITIME UNIVERSITY
(A Central University, Government of India)

December 2017 End Semester Examinations

Diploma in Nautical Science leading to Applied Nautical Science - Semester I

Navigation –I: Terrestrial & Celestial

Subject Code: UD11T3104

Date: 07.12.2017

Maximum Marks : 70

Time: 3 Hrs.

Pass Marks : 35

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- Note: 1) Use of BA Chart 813 (South Coast of Sri Lanka) for Chart Work.
2) Use of Selected Pages of Nautical Almanac 2008, Noorie's Tables & Non-programmable scientific calculator is permitted in Exam hall.
3) Selected pages of Nautical Almanac, 2008 to be used.
4) Exam Centers to provide appropriate Deviation Card to candidate (if required).
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Part-A: TERRESTRIAL NAVIGATION

Note: Q. No. 1 is compulsory and carries 5 marks. Attempt any 3 out of remaining four, they carry 10 marks each.

1. On 23rd Sept 2008, the sextant altitude of the Sun's LL was $66^{\circ} 10.6'$. If IE was $2.8'$ on the arc and HE was 10.5 m, find the True Zenith Distance. [5 marks]
2. Write Short notes on [2x5=10 marks]
 - a) Parallels of Latitude
 - b) Obliquity of Ecliptic
 - c) Declination
 - d) Visible Horizon
 - e) Celestial Sphere
3. a) A ship in position $36^{\circ}12'N$ $089^{\circ} 18'E$ sailed due East for 300 M. Find the position arrived. [5 marks]
b) A ship in position $20^{\circ} 11'N$ $072^{\circ} 52'W$ sailed on course 032° (T) for 238 M. Find the position arrived. [5 marks]

4. a) Find the rhumb line course & distance from starting position P $10^{\circ} 19' N 140^{\circ} 40' W$ to arrival position Q $02^{\circ} 12' S 160^{\circ} 18' W$ [5 marks]

b) Fill in the blanks: [2+2+1=5 marks]

True course	Variation	Magnetic course	Deviation	Compass course	Error
167°		174°	6°E		
	5°E		5°W	343°	
	7°W	280°	2°W		

5. On 5th July, the noon position was $20^{\circ} 12' S 50^{\circ} 36' W$. The vessel then steamed as follows

Time	Co (G)	Gyro Error	Speed by log
1200 (5 th July)	046°	1° H	14.0 kts
a/c 1800	153°	1° L	15.0 kts
a/c 2300	149°	1° L	15.0 kts
a/c 0500	206°	0°	14.5 kts
1200 (6 th July)	200°	0°	15.0 kts

At 0200, clocks were advanced by one hour. Find the DR position at noon on 06th July. [10 marks]

Part B: CHART WORK

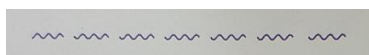
Note: Q. No. 6 is compulsory and carries 5 marks. Attempt any 3 out of the remaining 4, they carry 10 marks each.

6. Identify the following Symbols and Abbreviations [1x5=5marks]

a) LAT

b) MSL

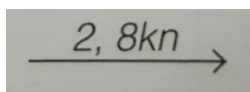
c)



d)



e)



7. Write short notes on : [2x5=10marks]

a) Variation

- b) Estimated Position
- c) Admiralty Chart Catalogue
- d) Sea Mile
- e) Prime Meridian

8. At 1000 hrs, 'Point De Galle' [Fl(2)15s28m25M] bore 030° (C) at 12 Miles.

(i) Find the position at 1000 hrs. (Variation 3° W; Deviation 2° W)

From this position at 1000 hrs, ship steered a course of 100° (C) at a speed of 10 knots.

(ii) Find the bearing & distance off when 'Dondra Head' [Fl5s47m28M] will be abeam on Port Side.

(iii) Find the time when 'Dondra Head' [Fl5s47m28M] is abeam. (10 marks)

9. At 1500 hrs the light near Colombo harbour [Fl(3)10s26m25M] was bearing 090° (T). The vessel was steering a course of 170° (T) at 8 knots. At 1800 hrs the Barberyn Light [Fl.20s46m27M] was observed bearing 110° (T). Find the vessel position: (i) at 1800 hrs, and (ii) at 1500 hrs. (10 marks)

10. A ship observed 'Hambantota Point' (approx. position $06^\circ 07'N$ $081^\circ 07.5'E$) and 'Patirajja Point' (approx. position $06^\circ 10'N$ $81^\circ 13.5'E$) in transit bearing 070° (C) & at the same time Hambantota Point' was 10 miles off. Find the position of the ship. Find the Compass error & the deviation of the ships head if the variation was 3° W. (10 marks)

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