

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

December 2016 End Semester Examinations
Diploma in Nautical Science - First Semester (2015 batch onwards)

Navigation- I : Terrestrial & Celestial (UD11T3104)

Date : 17.12.2016

Maximum Marks: 70

Time: 3 Hrs

Pass Marks : 35

Note: Use BA Chart no 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 the Exam Hall.

SECTION- A
Terrestrial Navigation

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

1. Find the True Zenith distance of the Sun when the sextant altitude of the Sun's lower limb was $33^{\circ} 41'$ on 22 February 2008 . IE = - 2.2', HE = 12 m. (5 marks)
2. Write short notes on: (2x5 = 10 Marks)
 - (a) Sea Mile
 - (b) Obliquity of the Ecliptic
 - (c) Difference in Meridional parts
 - (d) Parallels of Declination
 - (e) True Altitude
3. (a) A ship in position $24^{\circ} 41' S 177^{\circ} 50' W$, steered along the parallel of latitude westward & covered 400'. What was her final position? (5 Marks)
- (b) A ship in position $03^{\circ} 25' S 002^{\circ} 40' W$ steered 050° and covered a distance of 500'. Find her final position? (5 Marks)

4. (a) A ship departed the position $31^{\circ}35'S$ $122^{\circ}20'W$ on a rhumb line track & arrived at position $13^{\circ}22' N$ $125^{\circ}40'E$. Find the course steered & distance covered. (5 Marks)
- (b) Find the true course if the compass course was $324^{\circ}(C)$ (variation = $1^{\circ} W$). Also find the true bearing if the compass bearing of a lighthouse observed from the ship steering the compass course $324^{\circ}(C)$ was $116^{\circ}(C)$. (5 Marks)

Use the following deviation table:

Ship's head (C)	310°	320°	330°	340°
Deviation	$5^{\circ} W$	$2^{\circ} W$	$1^{\circ} E$	$4^{\circ} E$

5. On 15 April 2013 at 1200 h , a ship in position $18^{\circ}33'N$ $105^{\circ}23' W$ steered the following courses :-

	Date	Time	Co(Gyro)	Leeway	Wind	Log
	15 April	1200	315°	3°	S	0
a/c	15 April	1900	026°	4°	E	86
a/c	16 April	0300	135°	5°	N	190
	16 April	1200				300

Gyro error was 2° high. Find the position at noon on 16 April 13. The current was $240^{\circ}(T)$ at 2.5 kn throughout. (.a/c means 'Alter course') (10 Marks)

SECTION- B (Chart work)

Note: 1. Q No 6 is compulsory and carries 5 marks.
2. Attempt any 3 out of remaining four, they carry 10 marks each.

6. Draw the symbols of the following as per NP 5011 (1x5= 5 marks)
- Ebb tide stream with rate
 - Submerged wreck depth known
 - Established direction of traffic flow
 - Obstruction, depth known
 - Sounding of doubtful depth
7. Write short notes on the following: (2x5= 10 marks)
- Variation

- b) Folios
- c) Estimated position
- d) Natural scale of chart
- e) Fix

8. At 0800 h , from a ship, Little Basses Reef Light VQ(2)10s 34m 27M bore $320^{\circ}(T)$ at 12'. Find the position at 0800 h. From this position a course $240^{\circ}(T)$ was steered. (Ship's speed – 12kn. Current set $180^{\circ}(T)$ @ 2 kn). Estimate the position at 1000 h. Also find CMG .
(10 Marks)
9. At 1100 h a vessel steering $160^{\circ}(T)$ at 10 Kn , observed Beruwala Point Fl 20s 46m 27M on bearing $120^{\circ}(T)$ and at 1200 h the same light house bore $050^{\circ}(T)$. Find the position at 1200 h.
(10 Marks)
10. A ship observed Weligama F.R. 9m 5M & Mirissa Point in transit, bearing $310^{\circ}(C)$ & at the same time the range of the Weligama F.R. 9m 5M was 5'. Find the position of the ship. Find the Compass error & the deviation of the ships head if the variation was $2^{\circ} W$.
(10 Marks)
