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

June 2017 End Semester Examinations
Diploma in Nautical Science – First Semester

Navigation – I: Terrestrial & Celestial – UD11T 1104)
(Aug' 2009 to Feb' 2012 batches only)

Date: 19.06.2017 Maximum Marks : 70
Time: 3 Hrs Pass Marks : 35

Notes:-

1. All Questions are compulsory.
2. Use of non-programmable scientific calculator, Nautical Almanac 1992 and Noorie's Nautical Table are allowed.
3. Candidates must show the complete working (including rough work) and not answers alone.
4. Use diagram/sketches/figures for explanations where appropriate.
5. BA chart 813 to be provided by the Exam centre.

SECTION I

1. Define following with sketch:-
   a) Great circle b) Parallel of Latitude c) Departure d) Local Hour Angle e) Equinoctial (5 Marks)

2. Using plane sailing find the course and distance from Lat 56° 12.5'S Long 046° 12.5'W to Lat 50° 11.3 S Long 044° 14.8' W (5 Marks)

3. Using Mercator sailing, find the position arrived if the starting position of the ship was Lat 44° 11'N Long 140° 20'W, course was 056° T and distance covered was 2222 M. (5 Marks)

4. On 24th Sept 1992 at noon, a ship in DR posn 14° 44' N 124° 49'E, set courses as follows:-

	Time	Compass Co.	Dev	Var	Leeway	Wind	Log
	1200	174°	2° E	1° E	2°	SW	0
A/C	2300	218°	1° W	2° E	2°	S	162
A/C	0600	224°	3° W	1° E	2°	S	266
A/C	1200	264°	Nil	1° E	3°	S	348

During the above period the ship experienced a current setting 125° T at 1.0 Knots

Find :- (5Marks)

a) estimated position next noon

b) Course and speed made good from noon to noon

5. On 16th March 1992, the sextant altitude of the Sun's lower limb was 62° 24.5. If the index error of was 3.0' on the arc and height of eye was 16 m. Find the true altitude. (10 Marks)

6. a). Explain how the ship's clocks will be altered while on a course due east

b). Prove the formula: Sin amplitude = Sin Dec x Sec Lat (2+3=5Marks)

SECTION II

7. a) Find the True course, if the compass course was 048° (C) and Var 4° W. (Use Dev card given below) (2 Marks)

b) Find the Compass course, if the True course was 063° (C) and Var 4° W. (Use Dev card given below) (2 Marks)

c) Find the gyro course to steer, if the true course is 143° (T) and gyro error is 2° Low. (2 Marks)

8. Draw the following Chart Symbols:- (4Marks)

i. No bottom found at 120 m
ii. Pilot boarding area
iii. Anchoring prohibited
iv. Fishing Stakes

9. Explain the following:- (4x2 = 8 marks)
a. Mercator chart
b. Routeing Chart
c. Compass error
d. Set and Drift

10. a) At 0800 hrs Colombo Lt bore 097° T distance by radar 9 mile. Find the position.

b) From the above position find the course to steer to pass Beruwala Point Lt. 8 miles off counteracting a current setting in the direction 210° T at 2 knots.

c) Find the speed made good and time when Beruwala Point Lt will be abeam.

(Ship's speed 13 Knots.) (10 Marks)

11. While steering a course of 260° T at 13 knots, at 1000 hrs Dondra Head Lt. bore 285° T. Same light bore 340° T at 1100 hrs. Find the position of the ship at 100 hrs and 1100 hrs. (5 Marks)

Dev Card

Ship's head By compass	Dev
040°	3°E
050°	5°E
060°	6.5°E
070°	4.5°E
080°	2.5°E

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