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**INDIAN MARITIME UNIVERSITY**  
(A Central University Government of India)  
**END SEMESTER EXAMINATIONS-June-July 2019**  
**Diploma in Nautical Science**  
**Semester -I**  
**Navigation I : Terrestrial & Celestial**  
**(UD11T1104)**

Date: 27-06-2019  
Time: 3 hours

Max. Marks: 70  
Pass Marks: 35

**Note:**

Use BA chart 813 (Srilanka). Use of Norie's tables and selected pages of 2008 Almanac is allowed. Non programmable scientific calculator is permitted.

**Part – A : Navigation**

**(Q1 is compulsory, answer any three from Q2 to Q5)**

- 1) Two ships sailing due north at same speed are 385 NM apart at parallel of latitude of  $42^{\circ}30'S$ . What distance will they be apart at  $20^{\circ}30'S$  latitude? (5 Marks)
- 2) Define following: (10 Marks)
  - a. D'Long.
  - b. Latitude of a Place.
  - c. Departure.
  - d. Meridional Parts.
  - e. Great Circle.
- 3) (a) Calculate TZD on 31st August 2008 when sextant altitude of sun's LL was  $39^{\circ} 15'$ . (given IE : 3.1' off the arc and HE : 20 meters). (5 Marks)  
(b) Use Mercator sailing to calculate the course & distance between: (5 Marks)  
From:  $42^{\circ}29'N, 177^{\circ}37'W$  ; To:  $44^{\circ}16'N, 179^{\circ}24'E$
- 4) With a neat sketches derive the formula of parallel sailing (with Departure, D'Long & Latitude). (10 Marks)
- 5) (a) Convert the following quadrantile to three figure notation & vice versa:  
A)  $347^{\circ}(T)$ ; B)  $293^{\circ}(T)$ ; C)  $173^{\circ}(T)$ ; D)  $S78^{\circ}E$ ; E)  $N03^{\circ}W$  (5 Marks)  
(b) Using plane sailing find the final position arrived if: (5 Marks)  
Initial Position is  $20^{\circ}11'N / 072^{\circ}52'W$ ; course:  $032^{\circ}(T)$ , Dist: 238nm

**Part – A : Navigation**

**(Q1 is compulsory, answer any three from Q7 to Q10)**

- 6) Draw the following chart symbols as per Nautical Publication 5011. (5 Marks)
  - a. Eddies
  - b. No bottom found at a shown depth (eg. 330m)
  - c. Wreck showing any part of hull or superstructure at the level of Chart Datum
  - d. Fishing Stakes
  - e. Production platform, Platform, Oil Rig

7) (a) Write show notes on:- (2.5x2=5 Marks)  
i) Small Scale Charts ii) Admiralty Chart Catalogue.

(b) Calculate the following(use Dev.table below as necessary):(2.5x2=5 Marks)

i) True Course if compass course  $222^{\circ}$  (C), Variation  $3^{\circ}$  W

ii) Gyro course if True course  $222^{\circ}$  (T), Gyro Error  $3^{\circ}$  Low

<u>Ship's Head by Compass</u>	<u>Deviation</u>
$210^{\circ}$	$11^{\circ}$ E
$220^{\circ}$	$9^{\circ}$ E
$230^{\circ}$	$8^{\circ}$ E
$240^{\circ}$	$6^{\circ}$ E

8) (a) A vessel is in position 10 miles to West off Point de Galle Lt. at 0800hrs. Find the Latitude & Longitude. From this position find the bearing and distance of Hikkaduwa Point.

(b) Plot a position where Dondra Head Light will bear  $341^{\circ}$  (T) & distance 9 miles off by radar. Find the bearing & distance of Miraisa Point from there. (10

Marks)

9) (a) A vessel is 4.5 miles to NW of Beruwella Point Light at 1300 hrs and wish to reach a position 6 miles to south west of Colombo light. Find both the positions.

(b) Find course to steer, Distance and time to reach the destination if vessel speed 10 Knots (10 Mar

10) From a west bound ship, Dondra head Light was 10.5 miles off, and Rassamunai point was 10 miles off by radar at 1500 hrs. Find the position. From this position, the vessel intended to pass Point D'Galle light 7 miles off to starboard, Find CTS, Beam bearing, Beam Time if vessel speed is 10 knots. (10 Marks)

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