

INDIAN MARITIME UNIVERSITY
(A Central University, Govt. of India)
May/June 2018 End Semester Examinations
DNS (Diploma in Nautical Science)
Semester I

Navigation I- Terrestrial & Celestial (UD11T2104)-

Date: 07.06.2018
Time: 3 Hrs

Max.Marks: 70
Pass Marks: 35

Note:-Use of Non-programmable Scientific calculator, Nautical Table and Nautical Almanac are permitted.

SECTION A

(Question no 1 is compulsory. Attempt any 3 questions from the remaining. Each carry 10 marks)

1. Define following:-
 - a) Greenwich hour angle
 - b) Declination
 - c) Equinoctial
 - d) Local Hour Angle
 - e) Rational Horizon

2. a) Using plane sailing find the course and distance from Lat $03^{\circ} 12' N$ Long $004^{\circ} 11.3' E$ to Lat $02^{\circ} 30.4' S$ Long $002^{\circ} 10' W$.

b) Using Mercator's Principle sailing, find the position arrived if the starting position of the ship was Lat $44^{\circ} 11' N$ Long $140^{\circ} 20' W$, course was $N56^{\circ} E$ and distance covered was 2222 nm.

3. On 12th Dec 2017 at noon, a ship in DR posn $24^{\circ} 14' N$ $134^{\circ} 19' E$, set courses as follows:-

	Time	GyroCo	GyroError	Leeway	Wind	Log
Set Co	1200	082°	$2^{\circ} L$	3°	S	0
A/Co	2300	118°	$1^{\circ} L$	2°	NE	156
A/Co	0600	134°	$1^{\circ} L$	2°	NE	260
A/Co	1200	084°	Nil	2°	S	340

Find DR position next noon (13th Dec 2017)

4. On 13th Sept, the sextant altitude of the Sun's upper limb was $72^{\circ} 11.5'$. If the index error was $2.0'$ off the arc and height of eye was 14 mtrs, find the true altitude of Sun applying all corrections individually. Also find zenith distance.

5. a) Prove: $\sin \text{Amplitude} = \sin \text{Dec} \times \sec \text{Lat}$.
 b) Define International Date Line and state its use.

SECTION B

(Question no 6 is compulsory. Attempt any 2 questions from the remaining. Each carry 10 marks)

6. a) Draw symbols for following:-
 i. Anchoring prohibited area
 ii. Fishing stakes
 iii. No bottom found at 200 mtrs
 iv. Pilot boarding area
 v. Wreck showing hull or superstructure at chart datum
- b) Explain Ocean chart and Coastal chart.
7. a) Find the true course to steer when compass course is $145^\circ T$, Variation $6^\circ W$ Deviation from card given below.
 b) Find the compass course to steer when true course is $133^\circ C$, Variation $6^\circ E$ Deviation from card given below.
 c) Explain following:-
 i) Chart folio system ii) Leading Lights
8. While steering a course $030^\circ(T)$ at 13 Knots, Great Basses Reef Lt bore $286^\circ T$ at 0930 hrs. At 1030 hrs Little Basses Reef Lt bore $317^\circ T$. Find the position of the ship at 0930 hrs and 1030 hrs.
9. a) At 1900 hrs Beruwala Point Lt bore $035^\circ(T)$ distance 6.0 nm off. Find the ships position.
 b) From the above position find the course to steer to pass Colombo Lt 7 miles off when abeam on stbd. side. Find the time when Colombo Lt will be abeam if ship speed was 14 knots.

Deviation card

SHIP'HEAD BY COMPASS	DEVIATION
120°	$7^\circ W$
130°	$8.5^\circ W$
140°	$10^\circ W$
150°	$11^\circ W$
160°	$12^\circ W$
