

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

May-June 2018 End Semester Examination

DIPLOMA IN NAUTICAL SCIENCE (DNS)

**Semester : II**  
**NAVIGATION III -(UD11T1201)**  
**(Terrestrial, Coastal and Celestial Navigation)**

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Duration: 3 hrs

Max Marks:70

Date :04-06-2018

Pass Mark:35

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Note:-Use of Non-programmable Scientific calculator, Norie's Table and Nautical Almanac are permitted. Tidal graph and relevant chart to be provided by the Exam Centre.

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**SECTION A**

**(Attempt any 4 questions from this section. Each carry 10 marks)**

1. Differentiate and explain any **two** with diagram.
  - a) Solstices and equinoxes
  - b) Aphelion and Perihelion
  - c) Inferior planet and Superior planet
  
2. a) Explain with diagram, conditions required for a lunar eclipse to occur.  
b) Explain use of International Date Line.
  
3. On 21<sup>st</sup> Jan 1992, in DR 24° 38' S 110° 20' W, the sextant altitude of the Sun's LL on the meridian was 85° 05.5'. If the IE was 1.6' off the arc and HE was 10mtrs, find the latitude and the direction of the PL.
  
4. On 22<sup>nd</sup> Sept 1992, PM, at a ship in DR long 160° 12'W, the sextant altitude of the Pole star was 36°18.6' at GMT 23d 05h 21m 08s. If the IE was 2.8' on the arc & HE was 10mtrs, find the direction of position line and the Latitude.
  
5. On 30<sup>th</sup> April 1992, in DR 00° 20'N 60° 12'W, the sextant altitude of the Sun's UL east of the meridian was 44° 13.4'. GMT was 30d13h 00m 52s. If the IE was 3.1' off the arc and HE was 20mtrs, find direction of the PL and the longitude where it crosses the DR Lat.

## SECTION B

**(Attempt any 3 questions from this section. Each carry 10 marks)**

6. a) What are the advantages of ECDIS over conventional paper charts?  
b) Draw and explain characteristics of following IALA buoys:-  
i) East Cardinal buoy      ii) Safe Water Marking buoy.
7. Find the height of tide 0930 hrs standard time on 14<sup>th</sup> Dec. at Bombay. The extracts from the A.T.T are given below:-

TIME ZONE -0530 HRS		
14 <sup>TH</sup> Dec	0124	1.9 m
	0634	6.5 m
	1312	0.5 m
	2008	6.9 m

8. List 10 Publications/books required to be carried on board ship for passage planning.
9. a) A vessel steering a course  $261^{\circ}$  G at 14 knots, at 1800 hrs St. Catherine Pt. Lt. bore  $296^{\circ}$  G and at 1900 hrs it bore  $028^{\circ}$  G. During this time she experienced a current setting  $209^{\circ}$  T at 3 Knots, wind South leeway  $3^{\circ}$ . Find the ships position at 1800 hrs and 1900 hrs.  
b) Also find the course and speed made good.  
( Gyro error  $2^{\circ}$  L)

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