

**Indian Maritime University**  
**(A Central University, Govt of India)**  
**Mar/Apr'26 SE**

**Programme Name: Diploma in Nautical Science (DNS)**  
**Semester: 1**  
**Subject Code: UD11T6104**  
**Subject Name: Terrestrial Navigation**

Date: 16.03.2026

Max Marks: 70

Duration: 03 Hrs

Pass Marks: 35

General Instructions

- (i) All Questions are compulsory
- (ii) Non-programmable Scientific Calculator is Permitted.
- (iii) Norrie's Table/Meridional parts table/Tide graph to be provided by Institute



**Section A**

1. Vessel sails from  $06^{\circ}30'N$  latitude to  $01^{\circ}30'S$  latitude along  $135^{\circ}$  E meridian. The course & distance travelled by ship is
  - a. S x 480 Miles
  - b. N x 300 Miles
  - c. S x 300 Miles
  - d. N x 480 Miles
2. The Mercator chart is conformal, meaning it preserves the true shape of small areas and angles.
  - a) True
  - b) False
3. If True bearing =  $001^{\circ}$  Compass bearing:  $350^{\circ}$  , what is Compass Error ?
  - a.  $11^{\circ}$  W
  - b.  $11^{\circ}$  E
  - c.  $1^{\circ}$  E
  - d.  $10^{\circ}$  W
4. The scale of a Mercator chart remains constant throughout the chart.
  - a) True
  - b) False
5. In practice, Great Circle routes are first plotted on a Gnomonic chart and then transferred to a Mercator chart for navigation.
  - a) True
  - b) False
6. The Gnomonic projection shows the entire surface of the Earth on one chart.
  - a) True

- b) False
7. Which of the following is a very large-scale navigational chart?
- Coastal Chart
  - General Chart
  - Harbour Chart
  - Overview Chart
8. When the two leading lights appear vertically in line (one above the other), the vessel is on the correct course.
- True
  - False
9. Neap Tides are formed
- On the days of new moon
  - On the days of full moon
  - Both a & b
  - All are incorrect
10. SCAMIN is an attribute assigned to ENC objects and it means:
- The maximum scale at which the object disappears from display
  - The minimum scale at which the object disappears from display
  - The maximum scale at which the object may be used
  - The minimum scale at which the object may be used

### Section B

Five Questions of 02 Marks each

11. Explain (Standard) Compass Error & list the two components of Compass Error **(2 Marks)**
12. Define Meridional Part. State the formula which connects D'Long and DMP. **(1 + 1 mark)**
13. State one advantage & one disadvantage of a Gnomonic chart. **(1 + 1 mark)**
14. Identify the following symbols as per NP-5011 **(1 + 1 mark)**
-  Z-44
  -  Wk
15. ENCs can be classified into 6 types based on navigation purpose (scale of usage). List the names of all 4 types of ENCs. **(2 Marks)**

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**Section C**

16. a. From a position in North Hemisphere at latitude 'X', a vessel sails 'North' x **120 NM** and then 'East' x **240 NM**. If the D'Long achieved is **480 minutes** after Easterly leg of travel, find Latitude 'X'. Also provide a simple sketch for ship's travel **(5 Marks)**

b. List 5 properties of Mercator Charts (projection) **(5 marks)**

17. Find by Mercator sailing method, rhumb line course and distance from **position P** 35°00'N, 125°00'E to **position Q** 62°00'S, 075°00'W. Show neat sketch with labels to demonstrate your understanding. **(10 marks)**

18. Find Initial Course & Great Circle distance from 35°35'N, 141°42'E to 37°48'N, 123°20'W. Draw a suitable labelled sketch to support your working. **(10 Marks)**

19. a. Describe Geographical & Luminous Range of Lights **(5 marks)**

b. What are Sector lights ? Draw a simple sketch of a Sector light showing Red, White & Green sectors. **(5 marks)**

20. a. What is CATZOC ? What do you understand by ZOC - C ? **(5 marks)**

b. Given the following extracts from the Tide Tables, find the standard time during the rising tide on 28<sup>th</sup> February at which there will be 11 metres of water over a shoal patch where the chart shows 7 Metres sounding, off the Port of Darwin (Australia). **(5 marks)**

Extracts from A.T.T. for 28<sup>th</sup> Feb

Time Zone : - 0930

TIME	HEIGHT
0018	6.2
0557	1.5
1227	6.6
1832	1.3

