

Indian Maritime University
(A Central University, Govt of India)
End Semester Examinations – June 2026
Programme Name: B Sc [Nautical Science]
Semester: 2
Subject Code: UG21T6205
Subject Name: Terrestrial Navigation

Date: 10.06.2026

Max Marks: 70

Duration: 03 Hrs

Pass Marks: 35

General Instructions

- (i) All Sections (A, B & C) are to be attempted.
- (ii) All the Questions Are Compulsory.
- (iii) Norrie's Table permitted.
- (iv) Use of Non- Programmable Scientific calculators permitted.
- (v) Tidal Curve to be provided.

Section A

Ten MCQs/Fill in the Blanks of 01 Mark each – Choose the correct answer as applicable. (10 x 1 mark = 10 marks)

1. Which direction lies immediately clockwise of North-Northwest (NNW)?
a) Northwest (NW) b) North by West (N by W)
c) West-Northwest (WNW) d) North (N)
2. A gyro bearing of an object is observed as 040°, while the true bearing is 039°. The gyro error is said to be 1°.
a) East b) West c) High d) Low
3. Two ships (N –S of Each other & at same hemisphere) sailing West made equal D'long in the same duration of time:
a) Both the ship maintained same speed.
b) Departure made by both the ship is same
c) One of the ships must be on the equator.
d) Speed of the ship which is at lower latitude is more than the other.
4. What is Difference of Longitude (d'long)?
a) Arc of equator between two meridians b) Arc of meridian betn 2 places.
c) Angle at Earth's centre between 2 positions d) East- West Distance
5. Mean Latitude is 28°16.5' N; Initial Latitude is 26°48' N. Final Latitude?
a) 29°45' N b) 29°44' N
c) 29°43' N d) 29°42' N

6. A tide table shows the height of tide as -0.1 m. What does this indicate?

- a) 0.1 m above LAT b) 0.1 m below LAT
c) 0.1 m above MSL d) Falling by 0.1 m

7. Which of the following information is NOT provided by Routing Charts?

- a) Wind roses b) Ocean currents
c) Load line zones d) Tides

8. Continuous checking of position, traffic, and weather during a voyage falls under which stage of passage planning?

- a) Appraisal b) Planning
c) Execution d) Monitoring

9. Vessel's compass course 090°C . Deviation on this heading is 2°W . Variation as shown on the chart was 2°W in the year 2020, with an annual change of 1°E . Voyage date: 16 March 2024. Find True Course of the vessel?

- a) 088° T b) 090° T
c) 092° T d) 094° T

10. 'Pilots' is another name for which of the following Admiralty publications?

- a) Tide Tables b) Sailing Directions
c) List of Radio Signals d) List of Lights

Section B

Answer all five Question in short (5 × 2 marks = 10 Marks)

11. Box the compass from S to W.

12. Define Earth's compression

13. What are advantages of Gnomonic charts?

14. Explain Variation & Deviation.

15. What are Spring and Neap tides?

Section C

Answer all Five Questions (5 x 10 marks = 50 marks)

16. a) Derive the parallel sailing formula. (5 marks).

b) A ship in position $71^{\circ}28'\text{N } 160^{\circ}27'\text{W}$ sails and reaches position $71^{\circ}28'\text{N } 170^{\circ}29'\text{E}$. Find the vessels Course & distance steamed. (5 marks)

17. a) A ship steered West for 12 hrs at 20kts from a position $45^{\circ} 45'S / 002^{\circ} 58'E$; Find the position arrived. (5 marks)

b) Find, by Mercator sailing, the course and distance between Initial Position: $32^{\circ} 29' S 064^{\circ} 00' E$ & Final Position: $49^{\circ} 50' S 005^{\circ} 15' E$ (5 marks)

18. On a GC passage from X: $24^{\circ} 00.0' N 074^{\circ} 15.0' W$ to Y: $46^{\circ} 00.0' N 053^{\circ} 45.0' W$, find: Great circle distance, Initial course & Final course (10 Marks)

19. a) Explain the 'Planning' stages of Passage Planning. (5 marks)

b) Explain the on-board procedure to transfer a Great circle course and distance from a Gnomonic chart to a Mercator chart. (5 marks)

20. a) Distinguish between Raster and Vector charts. (3 marks)

b) Find the earliest time on 17th June, a vessel off BOSTON drawing 3.4 meters draft will be able to cross a bar marked 2 meters, with a clearance of 1 meter under her keel. (7 marks)

Extract from A.T.T.

16 F

Time	Height
0229	3.1 m
0848	-0.1 m
1508	2.9 m
2109	0.2 m

17 Sa

Time	Height
0325	3.0 m
0939	0.0 m
1601	2.8 m
2205	0.3 m
