

**Indian Maritime University**  
**(A Central University, Govt of India)**  
**End Semester Examinations – December 2022**  
**Programme Name: B Sc (NS)**  
**Semester: 1**  
**Subject Code: UG21T5106**  
**Subject Name: TERRESTRIAL NAVIGATION**

Date: 30.12.2022

Max Marks: 70

Duration: 03 Hrs

Pass Marks: 35

General Instructions

- (i) All Sections (A, B & C) are to be attempted.
- (ii) Scientific calculator, Norrie's table is permitted.
- (iii) World Map will be supplied by the examination centre.

**Section A**

Objective Type Questions (1x10=10 Marks)

1. Panama canal connects ----- and ----- oceans.
2. The course line that cuts all the meridians at the same angle appears as a ----- line on the Mercator chart ,but when seen on the surface of the earth it appears in the shape of a -----.  
a) spiral, straight  
b) straight ,straight  
c) straight, spiral  
d) none of these.
3. Dlat from 5 °S to 2°N in minutes is  
a) 7° N  
b) 4°N  
c) 3°S  
d) 7° S

*K. K. K.*

4. At the equator, Departure and D'long is same.

- a) True
- b) False

5. ----- sailing is limited to calculations where the distance between the start and final position does not exceed 600 nautical mile.

- a) Polar
- b) Plane
- c) Mercator
- d) Great circle.

6. In a Mercator projection used for producing Navigational chart the ----- scale appears to be same over the entire chart.

- a) latitude
- b) longitude
- c) latitude and longitude
- d) none of these.

7. The great circle intersects the meridian of the vertex at -----

- a) 45 deg
- b) 60deg
- c) 90deg
- d) 180deg

8. In a great circle sailing, when sailing between two positions on equal latitudes in different hemispheres, the Initial course will be ---- to the final course.

- a) more
- b) less
- c) equal
- d) none of these.

9. Geographical mile is the length of the arc of the ----- subtending an angle of 1' at the centre of the earth.

- a) meridian
- b) parallel of latitude
- c) Equator
- d) none of these



10. The deviation of a compass varies as the ship's head changes.

- a) True
- b) False.

**Section B**

Short answer type questions (2X5=10Marks)

- 11. Define Nautical Mile.
- 12. What is natural scale of a chart?
- 13. list any two advantage of Mercator chart .
- 14. What is a Great circle and Small circle ?
- 15. What is deviation and variation and how is it related to the compass error?

**Section C**

Answer all five questions. (10 Marks Each)

- 16.
  - a) Given the compass error is  $6^{\circ}W$ , deviation is  $2^{\circ}E$ . Find the variation. (5 marks)
  - b) By Mercator sailing find the true course and the distance between the position  $49^{\circ}10' N 12^{\circ}30'W$  and  $25^{\circ}15'N 26^{\circ}50'W$ . (5 marks)
- 17.
  - a) What is geographic and geocentric latitude of a place? (5 marks)
  - b) Find the course and distance from position A:  $49^{\circ} 35'N 004^{\circ}00'W$  to position B:  $50^{\circ} 10'N 002^{\circ}55'W$ . (5 marks)
- 18.
  - a) Find the compass course to steer to make good a true course of  $340^{\circ}$  if the variation is  $5^{\circ}E$  and the deviation is  $6^{\circ}E$ . (5 marks)

b) A ship in position  $45^{\circ} 25'N, 15^{\circ}05'W$  at 0900 steers the following courses and speeds .What is its position at 1315 hrs?

TIME	COURSE	SPEED
0900-0946	$045^{\circ}$	15 KNOTS
0946-1015	$312^{\circ}$	16 1/2 KNOTS
1015-1122	$217^{\circ}$	14 3/4 KNOTS



1122-1247

$103^\circ$

17 KNOTS

1247-1315

$190^\circ$

15 KNOTS

(5 marks)

19. Find the total distance and the initial course along a composite great circle track between a position off Cape of Good Hope,  $34^\circ 35' S 18^\circ 30' E$  and a position off Tasmania,  $43^\circ 40' S 146^\circ 50' E$ . The maximum latitude is  $50^\circ S$ . (10 marks)

20.

a) You are on a voyage from Chennai to London via the shortest route. Mark and mention the names of the ocean (2 nos), sea (3 nos), canal (01 no), strait (01 no), Durban, London and Chennai on the world map.

(5 marks)

b)

A Ship in the position  $40^\circ N 105^\circ 12' E$  steams through a distance of 1000 miles on a course of  $090^\circ (T)$ . Find the final position. (5 marks)

