Indian Maritime University
(A Central University2, Govt of India)
Dec'24 ESE
DNS
Navigation I: Navigation & Chartwork
UD11T5104

Max. Marks: 70 **Pass Marks: 35**
Date: 13.12.2024 **Time: 3 Hours**

Note: Section A (20Marks)–Q1 &Q2are compulsory.
Section B (50 Marks)-Answer any 5 questions from Q3 to Q9
Use of Selected pages of Nautical Almanac 2008, Norie's Tables and Non-programmable type Scientific Calculator is allowed in the Exam Hall.
Draw Sketches wherever required

Section A

MCQ Q1. (1 x 10 = 10 Marks)

		A	B	C	D
i	Pole around which Earth appears to rotate in Clockwise direction is named	NCP	North Pole	South Pole	SCP
ii	Length of 1 NM is	1852.3m	6080 m	1' arc of Latitude	1' arc of equator
iii	When we apply Dip correction to Observed Altitude, we get	Observed Altitude	True Altitude	Altitude measured at sea level	Sextant Altitude
iv	A line which intersects all Meridians at same angle is called	Great circle track	Rhumbline	Departure	Parallel of latitude
v	If the Compass Course is 359; Variation 4 W and Deviation 2 E, then True course is	005(T)	355(T)	001(T)	357(T)
vi	f) During dark hours Buoys are identified by	Lights - Rhythm & colour	By shape & top marks	By colour code	By number marked on the buoy
vii	Chart datum (CD) on a chart is	Level at MSL	Level at MHWS	Level at LAT	Level at HAT

1|3

viii	Cardinal marks are used	For both region A & B	For region A only	For region B only	Only within a chnnel
ix	Departure is	Dist. Measured along arc of equator	Dist. Measured along arc of meridian	D'long on Mercator chart	E-W distance measured along mean lat. Between two place
x	Compass Error is zero when	Devn. & var. is zero	Devn. & var. is same in value but different in name	Variation is zero	Deviation is Zero

2. Short Answer Questions - (2 x 5 = 10 Marks)

a) Explain relationship between Departure and D Long.
b)What do you understand by Obliquity of Ecliptic
c) While obtaining True Altitude of a celestial body, what is Semi diameter correction.
d) Explain briefly the natural scale of the chart.
e) What are the advantages of ECDIS over paper charts.

Section B (Answer any five questions)

Q3. (2 x 5 = 10 Marks)
a) State limitations of Plane sailing formula.
b) Describe the shape,colour,light characetristics and features of Cardinal marks as provided under IALA buoyage systerm.

Q4. (2 x 5 = 10 Marks)

a) Calculate Course and Distance from A 60°11.6'N 076° 44.3' W to B 55°10.3'N 080° 16.8'W
b) Enumerate the differences between ENC and RNC.

5. (2 x 5 = 10 Marks)
a) Find position arrived if a vessel sails from position 06° 10' S 176° 47' W on Rhumb line course 333°for a distance of 4450 NM
b) Describe briefly the WEND principle as promoted by IHO.

6. (2 x 5 = 10 Marks)
a) On 01 May 2008, Sextant Alt of Sun LL was 45°10', Index Error 2.1' on the arc, Height of eye 16 m. Find Zenith Distance.

b) Draw the symbols as per NP5011 for the following :

i Lighted oil production platform.
ii Pilot Boarding position
iii Precautionary Area
iv Radio reporting point
v Wreck showing any part of superstructure or hull at the level of chart datum

7. Choose your scale, say 1' = 1cm. Plot Lt Ho X and 4' east of X, plot Lt Ho Y. At 0700 hours Lt ho X and Y were in transit, transit bearing taken as 095° (C). At the same time, the ship was at 10' distance from Lt Ho X.

a) Plot the position of the ship at 0700Hrs. **(7 Marks)**
b) Find the Compass error & Variation if the Deviation was 3° W. **(3 Marks)**

8 Choose your scale, say 1' = 1cm. Plot a Lt Ho on your answer sheet. At 1500 hrs, a ship observed this Lt Ho bearing 035° (T). At 1600 hrs the same Lt Ho. Bore 090° (T). The vessel was steering a course of 330° (T) at 10 knots.

a) Plot the vessel position at 1600 hrs. **(7 Marks)**
b) Plot the vessel position at 1500 hrs. **(3 Marks)**

9. Plot on answer sheet, Lt Ho X. 6' NE(045°T) of X, plot Lt Ho Y. Plot Lt Ho Z 10' North of Lt Ho Y. Choose your scale such as 1'=1cm. At 0500 hrs, a ship on the course of 025° (T) observed Lt Ho X bearing 270°(T) & Lt Ho Y bearing 000°(T).

a) Plot the ship's position at 0500 hrs. **(2 Marks)**
b) The Vessel continued the course of 025°(T) at the speed of 10kts. Find the bearing & distance off when Lt Ho Z will be abeam on the Port Side. **(4 Marks)**
c) Find the time when Lt Ho Z will be abeam. **(4 Marks)**