INDIAN MARITIME UNIVERSITY

(A Central University, Government of India)

END SEMESTER EXAMINATIONS- DECEMBER 2018

B.Sc. (Nautical Science)

SEMESTER-I

Terrestrial Navigation(UG21T4106)

Date : 09.01.2019 Maximum Marks : 70

Time : 3 hours Pass Marks :35

Note: **Question No 1 is compulsory**

Solve any 6 questions from remaining 8 questions (each of 10 marks).

Norie's Nautical Table and Scientific Calculator are permitted if required

Draw Diagrams/Sketches/figures for explanation where necessary

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Q.1

(a) Define the following : (2x5=10 marks)

(i) D' Long

(ii) Great Circle

(iii) Departure

(b) State :

(i) Parallel sailing formula

(ii) Mercator Sailing formula

Q.2. Find the distance saved by steaming a great circle track against to the Mercator track from : (10 marks)

A. $43^0\ 36'$ S $146^0\ 02'$ E

to B. $26^0 12'$ S $34^0\ 00'$ E

Q.3 At noon on 14 th Sept, a ship in position $40^0\ 12'$N $76^0\ 46'$W set course of 249^0 (C) Dev 3^0 W, Var 6^0 W at an engine speed of 16 knots. At 1600, course was altered to 287^0 (C) Dev 2^0 E, Var 6^0 W and the speed was decreased to 14 knots. At 2200, course was again altered to 349^0(C) Dev 4^0 W, Var 5^0 W and speed of 14 knots was maintained till 0600 next morning, when course was altered to 273^0 (C) Dev 2^0 E, Var 5^0 W and speed increased to 15 knots. This course and speed was maintained till noon on 15 th Sept. An estimated current was setting 027 (T) at 2 knots throughout the day.

At noon on 15 th Noon, the ship's position was fixed as 42^0 20'N 82^0 20' W. Calculate the DR position on 15th noon.

(10 marks)

Q.4 (a) What is the difference between a Nautical mile and a Geographical mile. Explain why does the length of a Nautical mile changes.

(b) Find the length of a Nautical mile at 60^0N latitude. (2x5=10 marks)

Q.5 (a) Box the compass from North-West to North-East via North.

(b) Briefly explain "Deviation" and "Variation". (2x5=10 marks)

Q.6 (a) A vessel in lat 47^0 S long. 054^0 W steers a course of 270^0(T) for a distance of 412 miles. Find the position arrived.

(b) Find the course and distance between the following positions.

A. 37^0 31'N 14^0 00'W
B. 35^0 11'N 09^0 05' W (2x5=10 marks)

Q.7 (a) What is meant by Natural Scale of a Chart.

(b) Enumerate the advantages and disadvantages of both Mercator and Gnomonic charts. (2x5=10 marks)

Q.8 Indicate the following on the World map: (10 marks)

Suez Canal, Sea of Japan, Australia, Mumbai Port, Red Sea, Panama Canal, New York Port, North Atlantic Ocean, Malacca Straits, Cape Town.

Q.9 (a) How does the knowledge of the position of Vertex help in planning a Great circle track.

(b)Find the initial course to steer and the shortest distance between the following positions, if the vessel is not to go to the South of the parallel of 45^0 south.

A. 10^0 18.0' S 20^0 10.0' E
B. 45^0 00.0' S 160^0 10.0' E

(2x5=10 marks)

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IMPORTANT: AFTER ANSWERING Q.NO 8, ATTACH THIS SHEET WITH ANSWER SHEET