INDIAN MARITIME UNIVERSITY

(A Central University Government of India)

END SEMESTER EXAMINATIONS- DECEMBER 2018

DIPLOMA IN NAUTICAL SCIENCE

SEMESTER - II

NAVIGATION III: TERRESTRIAL, COASTAL & CELESTIAL NAVIGATION

(UD11T3201)

Date: 26-12-2018 Max. Marks: 70

Time: 03 hours Pass Marks: 35

Note: Use BA Chart 2675 or INT 5049 (English Channel) for Chart work

Use of Selected pages of Nautical Almanac 2008, Norie's Tables and Non-programmable type Scientific Calculator is permitted in the Exam Hall.

Exam Centers to provide 'Luminous Range Diagram' and 'Tide Curve Diagram' (from ATT 3) to candidates (if required)

Draw Sketches wherever required.

PART – A: TERRESTRIAL AND CELESTIAL NAVIGATION

Note: Q. No. 1 & 2 are compulsory. Answer any two out of remaining three.

Q1. Define the following: (1 x 5 = 5 marks)

(a) Greenwich Hour Angle (GHA)
(b) Rational Horizon
(c) Elevated Pole
(d) Azimuth
(e) Vertex of a Great Circle

Q2. On 29th Nov 2008 at GMT 17h 47m 49s, in DR 26°27'N, 130°27'W, the sextant altitude of the sun's UL was found to be 28°11', when the sun was bearing 135°(C). The index error of the sextant was 2.3' off the arc, and observer height of eye was 10m. Calculate the Intercept, the direction of the LOP and the deviation of the compass if the variation was 5°E. (10 Marks)

Q3. (a) Explain how the durations of day & night depend upon the declination of the sun and latitude of the observer. (5 Marks)

(b) On 5th March 2008, in position 32°12'N, 178°16' E, the rising sun bore S80°E (C). If the variation is 3°E find the deviation of the compass. (5 Marks)

Q4. (a) Calculate the GP of sun at GMT 6th Mar 2008 5h 23m 09s.(5 Marks)

(b)On 29th Nov 2008 in DR Longitude 169° 14' E and GMT 18h 26m 31s, an observation of Pole Star gave a sextant altitude of 41° 10.7'. If the IE is 1.3' off the arc and HE is 25 m, Find the direction of PL and position through which it passes? (5 Marks)

Q5. Find the initial great circle course and the shortest distance from a Position A: 24°00'N 074°15'W; to a position B: 46°00N 053°45'W
(10 Marks)

PART – B: CHART WORK

Note: Q. No. 6 is compulsory. Answer any three out of remaining four.

Q6. List the structure and contents of Admiralty List of Radio Signals.

(5 Marks)

Q7. At 1800 hrs a vessel while steering 260^0(G) at 14 kn, St Catherine Pt. Lt. bore 295^0(G) & at 1900 hrs, it bore 027^0(G). During this time the current was setting 209^0(T) @3 kn, Southerly Wind caused a leeway of 3^0. Find the ship's position at 1800 hrs & 1900 hrs. (Gyro Error: 3^0 Low) (10 Marks)

Q8. (a) A Vessel is in position from where Bill of Portland Lt bore 000°(T), distance 4.8 miles at 1600 hrs. Find the position.

(b) From this position, find compass course to steer to pass Start Point light 6 miles off, counteracting a current 135°(T) @ 2.5 kn. Wind North, leeway 3°.

(c)Calculate the time and distance off when Berry Head Lt, will be abeam.
(Variation 2°E, Engine speed 10 kn, Use deviation card as below)

Compass Head	Deviation
250°	1°W
260°	0.5°E
270°	2°E
280°	3.5°W

Q9. Find the height of tide off Singapore Harbour at 1430 Hrs using the following abstract from the tide tables. If charted depth was 4 meters, what is the depth of water:

TIME	HEIGHT
0014	2.7
0603	0.8
1209	2.9
1830	0.6

(10 Marks)

Q10. (a) Draw a neat sketch of "E" & "W" cardinal buoys and show the colour scheme, light characteristics and top marks.

(2.5x2=5 Marks)

(b)Expand the characteristics of the following lights:

a. Oc.G 4s 36ft 8M
b. Fl(2+1) 6M

(2.5x2=5 Marks)

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