Indian Maritime University

(A Central University, Govt of India)

B.SC (Nautical Science)

May/June 2018 End Semester Examinations

Semester IV

Navigation Paper-IV UG21T2406

Time: 3 Hours | Max Marks: 70

Date: 15.06.2018 | Pass Marks: 35

Notes:

1. Use of non-programmable scientific calculator, Nautical Almanac 2008 and Noorie's Nautical Table are allowed.
2. Candidates must show the complete working (including rough work) and not answers alone.
3. Use diagram/sketches/figures for explanations where appropriate.
4. BA Chart 5049 or equivalent chart to be provided by exam centre.
5. Tidal graph attached.
6. Use Deviation Card 1 from Chart work-SK Puri

SECTION-A

Answer any **4 questions.**

(4 X 10 = 40 Marks)

1. a) Explain "International date line" with example.

   b) Explain "equation of time".

2. a) Derive the formula, Sin Amp= Sin decl X Sec Lat.

   b) In DR 54° 23' N 046° 24' W, on 20th Jan 2008, the Sun set bearing 228°C. Find the deviation on the ship's compass if the variation was 2°W.

3. At GMT 31st Aug 17h 22m 26s, in DR Long178° 11' E, the sextant altitude of Pole star was 18° 47.4'. If the HE was 12.5 m and IE was 2.6'on the arc, find the Latitude and the position line.

4. In DR 33°18' N 000°12.6' W, a stellar observation gave an intercept of 4.2' towards Az 241°. After steaming for 122nm on a course of 090°, another astronomical observation gave an Obs Long of 002° 18.5' E bearing 140°(T). The EP used for working the second observation was obtained through the first ITP. Find the position of the ship at the second observation.

5. At GMT 4th Mar 22h 55m 40m, in DR 38° 11' S 151° 10' E, the sextant altitude Suns LL was 36° 02.8'. If the HE was 30 m and IE was 2.4'on the arc find the intercept and the position line.

SECTION-B

Answer any **3 questions.**

(3 X 10 = 30 Marks)

6. a) At 1900hrs, a vessel steering a course of 023°G at 10 kts, found Les Hanois Lt(GUERNSEY ISLAND) bearing 097°G distance 9 nm. Find the ships position. (Gyro error 3°H)
7. b) While steering course 023°G at 10 Kts. She experienced a current known to be setting 100°T at 3 kts and wind from NW, causing a leeway of 5°. Find the course and speed made good.

   c) Find the time when Casquets Lt. will be abeam.

8. Find the height of tide at St. John at 0400 hrs on 17th Dec. The extract from A.T.T is given below.

	TIME	HEIGHT
	0136	7.5
	0746	1.2
	1347	7.5
	2007	1.1

9. Draw and explain following IALA buoys:
   a) Cardinal buoys
   b) Isolated danger marking buoy

10. On a voyage from London to Avonmouth

    a) A vessel steering 250^0 (C) at 1900hrs, St. Catherine point Lt.bore 302^0 (C)

    and Nab Tower bore 002^0 (C) Find the ship's position at 1900 hrs.

    b) From this position, set a course by compass to pass Bill of Portland Lt. 10 miles off when a beam on the starboard side – Find the course of Steer.

    c) While on this course at 2100 hrs Anvil point Lt.Ho bore 4 points on the starboard bow and at 2145 hrs. Anvil point Lt.was a beam on the starboard side Find the ship's position at the time of beam bearing at 2145hrs.

    (Variation 14°W, Ship's speed 12 knots, Deviation card I.)

FOR FINDING THE HEIGHT OF THE TIDE AT TIMES BETWEEN HIGH AND LOW WATER