

INDIAN MARITIME UNIVERSITY

(A Central University, Government of India)

End Semester Examination December 2017

Programme Name: B.Sc (Nautical Science)

Semester: IV

Subject Name: Navigation IV

Subject Code: UG21T2406

Date: 27.12.2017

Maximum Marks: 70

Time: 3 Hours

Pass Marks: 35

Note: (a) Use of Non-programmable scientific calculator is permitted.

(b) Use of Norrie's Tables and Nautical almanac is permitted.

(c) Chart 5049 or equivalent and Tide graph to be provided by Exam Centre.

PART – A

Answer any 4 questions of the following 5 questions

(4 X 10 = 40 Marks)

1. Define following with suitable diagram: -
 - i. Geographical position of body
 - ii. Sidereal Day
 - iii. Equation of time
 - iv. Local Apparent time (LAT)
2. On 23rd Sept 2008 PM, in DR $48^{\circ} 18'N$ $085^{\circ} 42'E$ the sextant altitude of the Sun's UL was $20^{\circ} 04'$. GMT was 23d 10h 09m 34s. If the IE was 2.0' on the arc and HE was 24 mtrs, find direction of the PL and the longitude where it crosses the DR Lat.
3. On 20th Jan 2008, in DR $24^{\circ} 34'S$ $142^{\circ} 18'W$, the sextant altitude of the Sun's LL on the meridian was $84^{\circ} 05.0'$. If the IE was 2.6' on the arc and HE was 12mtrs, find the latitude and the LOP.
4. On 30th April 2008, in DR $00^{\circ} 18'N$ $060^{\circ} 14'W$ the sextant altitude of the Sun's UL east of the meridian was $44^{\circ} 14'$ when GMT was 30d 13h 01m 14s. If the IE was 3.1' off the arc and HE was 20mtrs, find the Intercept and direction of the PL.
5. On 1st Dec 2008, longitude $065^{\circ} 35.7'E$, the sextant altitude of the Pole star was $23^{\circ} 11.5'$ at GMT 01d 01h 03m 32s. If the IE was 3.0' off the arc & HE was 2 mtrs, find the direction of position line and the Latitude.

PART – B

Answer any 3 questions of the following 4 questions

(3 X 10 = 30 Marks)

6. At 0830 hrs a ship in DR $49^{\circ} 38'N$ $004^{\circ} 08'W$ took a star sight which gave the observed Longitude to be $004^{\circ} 04'W$ and azimuth of $102^{\circ} T$. Soon after that thick

fog set in and the radar was not functioning. Find the safe true courses to steer so as to reach Deep Sea Pilot Station off Berry Head. Also find the distance to steam on the first course. What is the principle involved in setting your courses?

7. a) At 0630 hrs a ship steering a course 096° T at 12 knots, Pt. de Barfleur Lt. Ho. bore 135° T and at 0830 hrs the same light was abeam. A current was known to be setting 340°T at 2 knots. Find the position at 0630 and 0830 hrs.
- b) Describe following IALA buoys:-
- i) Safe water marking ii) Stbd. hand Region B iii) West cardinal
8. The clearance under a bridge at Antwerp given on the chart is 80 mts. Mean High Water Spring at Antwerp is 5 m. What will be the clearance under the same bridge at 1200 hrs Standard time on 12th Feb 1992? Admiralty Tide table is given below:-

	TIME	HEIGHT
12 TH Feb	0234	0.7
	0836	5.2
	1500	0.7
	1911	5.0

9. Find the times and heights of high and low water at Maple Bay (# 9077) on 6th of Feb. The extract from Admiralty Tide table is given below:-

Extracts from Part I of ATT

Standard Port:- Vancouver

	TIME	HEIGHT
6 TH Feb Vancouver	0054	1.4
	0734	4.5
	1346	2.4
	1911	3.8

Extracts from Part II of ATT

Place	Position		Time		Height		Differences(in	
	Lat	Long	HHW	LLW	MHH	MLH	MHL	MLLW
Vanco	---	---	---	---	4.4	3.9	2.9	1.2
Maple	48°4	123°	-	+00	-	-0.6	-0.2	-0.1

Seasonal changes in Mean Level

Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Standard Port: -Vancouver											
+0.1	+0.1	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-	-	-
Secondary Port: -Maple Bay											
+0.1	+0.1	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-	-	-
