

DIPLOMA IN NAUTICAL SCIENCE

Term-End Examination

December, 2007

BNA-021 : NAVIGATION III

Time : 2 hours

Maximum Marks : 70

Note : All questions are **compulsory**. Use BA Chart No. 2675, English Channel for Chartwork problems. Use of Non-programmable scientific calculator is allowed. Chart No. 2675 and Tidal curve diagram/graph to be provided by the institute.

SECTION A

(Navigation)

1. On 5th March, 1992, AM at ship in DR $38^{\circ} 11' S$, $151^{\circ} 10' E$, the Sextant Altitude of the Sun's LL was $35^{\circ} 59.1'$ when the Chronometer showed 10 h 54 m 54 s. The Chronometer was 42 s slow. If IE was 1.0' off the arc and HE was 28 m, find the direction of the PL and longitude of the point where PL cuts DR Lat. 10
2. On 1st Dec, 1992, in DR Long. $075^{\circ} E$ Sextant Meridian altitude of Sun's UL was $61^{\circ} 48.2'$. The sun bore south of the observer. Find the latitude of the observer and state the direction of PL. Given IE 2.4' on the arc, HE 21 m. 15

3. (a) Define any **two** of the following : 4
- (i) Equation of time
 - (ii) Perihelion
 - (iii) Greenwich Apparent Time (GAT)
- (b) With the help of diagram explain Lunar Eclipse and conditions necessary for it to occur. 6

SECTION B

(Chart Work)

4. (a) At 1700 hrs Dungeness Lt Ho Bore 270° (T)
 S. Foreland Lt Ho Bore 031° (T). Find the ship's
 position.
 The vessel then steered 225° (C). At 1900 hrs.
 Royal Sovereign Lt Vessel Bore 257° (C) and
 Dungeness Lt Bore 037° (C). Find the ship's
 position. 5
- (b) Find the set and drift of the current, if the ship's
 speed was 13 knots. 5
- (c) Also find the course and speed made good.
 (Variation 4° W, Deviation 9.25° E) 5
5. On a voyage from Southampton to Bristol, a vessel
 steering 250° (C) at 2100 hrs. Bill of Portland Lt Bore
 303° (C) and at 2200 hrs. the same light bore 033° (C).
 During the time the current was known to be setting
 016 (M) at 3 knots. Find the ship's position at 2100 hrs.
 and also at 2200 hrs.
 (Ship's engine speed 11 knots, Var 6° W Dev 1° W) 10
6. Find the height of tide at Darwin (Australia) at 1700 hrs.
 Standard time on 20th January. The extracts from the tide
 tables are given below : 10

Extracts from A.T.T.	
	TIME HEIGHT
	0250 2.0 m
20	0830 6.6 m
Thurs	1436 1.2 m
	2105 7.5 m