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BNA-021

B.Sc. (NAUTICAL SCIENCE)

Term-End Examination

December, 2010

00653

BNA-021 : NAVIGATION III (NAVIGATION AND CHART WORK)

Time : 3 hours *Maximum Marks : 70*

Note : *All questions are* ***compulsory.*** *Use of Non-programmable Scientific calculator is permitted. Use B.A. Chart 2675 (**English channel**). Tidal curve and Luminous Range Diagram to be provided by Exam centre.*

1. (a) Explain why Venus is visible as morning or evening planet. 5

   (b) Explain *any two* : 5

   (i) Equation of time

   (ii) Dynamic mean Sun

   (iii) International Date Line

2. On 5th March 1992 AM, at ship in DR 38°11'S, 151° 10' E, the Sextant altitude of Sun's Lower limb was 35° 59.1' when the chronometer showed $10^h\ 54^m\ 54^s$. The chronometer was $01^m\ 20^s$ slow at 12h 00m GMT on 25th Feb. 1992 and gaining 4s daily. If IE was 1.3' off the arc and HE was 30m, find the direction of PL and position through which it passes using long lay chron method. 10

3. On 1st Sept. 1992 AM on a ship in DR 18° 00′ N, 178° 11′ E the Sextant altitude of Pole star was 18° 47.4′ at $05^h\ 21^m\ 08^s$ chronometer time (error 01m 18s slow). HE : 12.5m, IE : 1.6′ on the arc. Find direction of PL and position through which to draw it. If the Azimuth of polaris at this time was 001° (C). Find compass error. 10

4. Define/explain *any two*: 5

(a) Elongation

(b) Qudrature

(c) Equinox

5. (a) On a Vessel steering 250° (C), at 1900 hrs st Catherine Lt. Ho. bore 302° (C) and Nab Tower bore 002° (C). Find ship's position. 3

(Dev 12° E, VAR:14° W)

(b) From 1900 hrs position set true course to pass Bill of Portland Lt. Ho. 10NM off on starboard. 2

(c) While on above course as per (b), at 2100 hrs Anvil Point Lt. Ho. was 4 points on starboard bow and at 2145 it was abeam. Find ship's position at 2145 hrs. 5

(Ship's speed 12 kts)

6. (a) At 1600 hrs VSA of Lands End Radio mast (190m) was 0° 28′ and Wolf Rock Lt. Ho. (41m) was 0° 14′. Find ship's position. 3

(IE: 2′ on the arc)

(b) From 1600 hrs position find true course to pass start point Lt. Ho. 12NM off counter acting a current setting 185° (T) at 2.5 kts. Wind NNW, force 7, leeway 4°. Find speed made good also. 4

(Ship's speed: 13 kts)

(c) Find time when Eddystone Rock Lt. Ho. will be raised and abeam. 3

(HE:15 meters, Ht of Eddystone Lt. Ho. 36m)

7. Plan a safe passage from 48° 10' N 005° 05' W to 49° 40' N 000° 50' W and make a way point table. 10

8. Write short note on *any two* : 5

(a) Mariners Handbook.

(b) Horizontal Danger angle.

(c) Danger of approaching very close to navigational aids.
