MERCHANT SHIPPING SECRETARIAT
GOVERNMENT OF SRI LANKA
CERTIFICATE OF COMPETENCY EXAMINATION

GRADE : OFFICER IN CHARGE OF A NAVIGATIONAL WATCH ON SHIPS OF 500 GT OR MORE (UNLIMITED)

SUBJECT : OCEAN & OFFSHORE NAVIGATION

DATE : 10th July 2014   Time : 0900 to 1200 hrs

Time allowed **THREE hours**   Total marks : 200
ANSWER ALL QUESTIONS   Pass marks : 70%

Formulae and all intermediate steps taken in reaching your answer should be clearly shown. You may draw sketches wherever required. Electronic devices capable of storing and retrieving are **not** allowed.

1) On 5th April, a ship in position $30^0 24$'S, $172^0 42$'E steamed the following courses:

Time	Comp Co	Dev	Wind	Leeway	Speed
1200	140^0	3^0 E	SW	4^0	10 kts
1600	130^0	3^0 E	SW	3^0	12 kts
2000	110^0	1^0 E	S	4^0	12 kts
2400	100^0	Nil	S	5^0	10 kts
0400	085^0	1^0 W	SE	4^0	12 kts
0800	065^0	2^0 W	NE	4^0	14 kts
1200	090^0	Nil	NE	3^0	12 kts

If Variation was 5^0 E and a current set the vessel 135^0 (T) at 1 knot throughout, find the following.
a) Course made good
b) Distance made good
c) Estimated position at noon on 06th April

(35 marks)

2) A vessel in position A: (10^0 30'S, 090^0 12'W) has to proceed to position B: (30^0 06'S, 178^0 48'W) by a great circle track. Find the following;
   a) Great Circle distance
   b) Initial course
   c) Final course
   d) Position of the vertex

(35 marks)

3) Find by Mercator's Principle the course and distance from starting position A: (20^0 06'N, 126^0 54'E) to B: (42^0 18'N, 158^0 12'E).

(25 marks)

4) On 22nd September 1992, PM ship in DR 40^0 36'S, 140^0 48'W, the sextant altitude of Saturn was 54^0 56.2' at 04h 14m 36s chronometer time (error 06m 30s fast). If IE was 3.0' on the arc and HE was 20 m, find,
   a) The direction of the Position Line (PL)
   b) The longitude where it crosses the DR lat.
   c) The position through which to draw the PL

(35 marks)

5) On 2nd May 1992 A ship in DR 15 º 46 S ,064º 12 E following Simultaneous celestial Observations made

   Find the position of the vessel.

   Fomalhault - 1.4M Towards from azimuth 244º(T)
   Capella - 6.4M Towards from azimuth 023º(T)
   Canopus - 3.0M Away from azimuth 147º(T)

(30 marks)

6)
   A- On 23rd September 1992 in DR 24º 30'N 161º 56'E the sextant meridian altitude of the Sun's Lower Limb was 65º 12.1'. If IE was 2.3' on the arc and HE was 10.5m find the Latitude.

(20 marks)

   B- Jan 20th 1992 in DR 54º 20'S 46 27'W, the sun set bearing 234º (C). If variation was 3ºW find the deviation of the compass

(20 marks)