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 AND OFFSHORE NAVIGATION
DATE : 26.10.2023 Time : 0900 to 1200 hrs

Time allowed **THREE hours** Total marks : 150
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) Find the initial course, final course and the distance along the composite track from A: 45^0 00'N 110^0 00'E to B: 45^0 00'N 175^0 00'E having a ceiling latitude of 47^0 00'N.

(25 marks)

2) Find by Mercator's Principle the course and distance from starting position A: 30^0 12'N, $015^0$40'W to B: 42^0 36'N, $060^0$50'W. (20 marks)

3) On 22nd September 1992, PM at ship in DR 47º 12'N, 084º 51'E, the sextant altitude of the Sun UL was 21º 03.6' when the chronometer showed 10h 06m 30s (error 03m 15s slow). If IE was 1.6' on the arc and HE was 22m, find by intercept method the direction of the PL and a position through which it passes.

(20 marks)

4) On 17th January 1992, AM at ship in DR 32º 42'N 101º 15'E, the sextant altitude of Venus was 19º 43.6', when the chronometer showed 11h 37m 18s (error 02m 10s slow). If IE was 1.4' on the arc and HE was 17m, find the direction of the PL and the longitude where it crosses the DR latitude and a position through which to draw it.

(25 marks)

5) On 13thSeptember 1992, PM at ship in DR $40^0$10'N $075^0$20'E, the Pole Star bore 356^0 (C) at 04h 15m 26s by chronometer (error 05m 14s fast). If Variation was 9^0 E, find the deviation of the compass.

(20 marks)

6) a) On 1st September 1992, in DR $10^0$00'N$135^0$42'W, the rising Moon bore105^0 (C). If variation was 1.2^0E, find the deviation of the compass.

(20 marks)

b) On 06th March 1992, in DR $59^0$35'S$086^0$11'W the sextant meridian altitude of the star Altair was $21^0$47.8'. If IE was 2.2' on the arc and HE was 14m, find the latitude and the direction of the PL.

(20 marks)