



**DIRECTORATE OF MERCHANT SHIPPING
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 : BRIDGE EQUIPMENT

DATE : 26th Apr 2024

Time allowed THREE hours

Total marks : 120

Answer all SIX (6) questions

Pass marks : 50%

Formulae and all intermediate steps taken in reaching your answer should be clearly shown. You may draw sketches wherever required.

1. a) Write short notes on following Auto pilot controls
(i) Rudder Control (ii) Weather Control (06 Marks)
b) Describe how to determine and eliminate the side error of a sextant (06 marks)
c) Write short notes on followings
i) BNWAS ii) Quartz crystal chronometer (08 marks)

2. a) Explain the principle of “Electromagnetic log” with an aid of a diagram (08 marks)
b) Explain the following systems with reference to an echo sounder
i) Continuous Wave System ii) Pulse System (08 marks)
c) What are the second trace echoes? (04 marks)

3. a) Briefly describe the function of DGPS (06 marks)
b) Explain the method of measuring time interval of GPS satellite signal (06 marks)
c) What is meant clock bias Error (04 marks)
d) What is the difference between e-loran and traditional loran-c system? (04 marks)

4. a) Explain the following properties of free gyroscope
i) Gyroscope Inertia (Rigidity in the space)
ii) Three degree of Freedom (08Marks)
- b) What are the “Static Data” and “Dynamic Data With reference to AIS? (06 Marks)
- c) write down inherent Limits of AIS? (06 Marks)
5. a) Describe the followings with reference to ECDIS
(i) Raster Charts (ii) Vector Charts (05 marks each)
- b) Write short notes on following Auto pilot controls
(i) Rudder Control(ii) Weather Control (06 Marks)
- c) What are the advantages with an auto pilot? (04 Marks)
6. a) List the contents of a LRIT message? (03marks)
- b) Explain the different between LRIT system and the AIS system. (05 marks)
- c) Describe the followings with reference to ECDIS
(i) Raster Charts (ii) Vector Charts (06 marks)
- d) Describe the methods available for updating the Electronic charts (06 marks)