



**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 : METEOROLOGY
DATE : 14th Dec 2023 Time:

Time allowed THREE hours	Total marks : 180
ANSWER ALL QUESTIONS	Pass marks : 50%

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. a) Define the followings.
 - i) TRS
 - ii) Path
 - iii) Track
 - iv) Dangerous Quadrant
 - v) Navigable Semicircle (20 marks)
- b) Describe the warning signs of an approaching TRS (10 marks)

2. a) Describes the characteristics and location of the,
 - i) Doldrums
 - ii) Trade Winds
 - iii) Horse Latitudes
 - iv) Westerlies (20 marks)
- b) Briefly explain about the NAVTEX (Navigational Telex) system. (10 marks)

3. a) Define “Depressions” (08 marks)
- b) Briefly describe the followings,
 - i) Frontolysis
 - ii) Frontogenesis
 - iii) Line Squall
 - iv) Occlusion
 - v) Warm & Cold Occlusion (10 marks)
- c) Explain the Formation of Frontal Depression (12 marks)

4. Solar radiation is the fundamental energy driving our climate system, and nearly all climatic and biologic processes on Earth are dependent on solar input. Energy from the sun is essential for many processes on Earth including warming of the surface, evaporation, photosynthesis, and atmospheric circulation.
- a) Explains with the suitable diagram the how effect on insolation
 - i) variation in Latitude
 - ii) variation in the sun's declination (10 marks)
 - b) Briefly explains the Greenhouse effect (10 marks)
 - c) Why cloudy nights are warmer than clear nights (10 marks)
5. a) Explains the method of estimating the strength of the wind from the appearance of the sea surface, using the Beaufort wind scale (18 marks)
- b) Lists the factors, other than the wind speed, which affect the appearance of the sea surface (06 marks)
 - c) Explains the differences between apparent and true wind. (06 marks)
6. a) Name the things that effect Air Pressure. (06 marks)
- b) Explain how atmospheric pressure decreases with height above sea level. (06 marks)
 - c) Define followings,
 - i) Humidity
 - ii) Barometric Tendency (08 marks)
 - d) Give an explanations for Smog and Orographic fog (Hill Fog). (10 marks)