

***Candidate's Name:***

***Ports and Shipping Organization  
Examination and Certification Directorate***

***Exams Cycle:***

**Subject: Meteorology**  
**Rank : Chief Mate (GT $\geq$ 3000)**

**Date:**  
**Time allowed: 2.5 Hrs**

- Q.1)** a) Draw a plan of a TRS showing isobars, wind circulation, path, track, vortex, vertex, trough line, dangerous/navigable semicircle/quadrant in northern hemisphere. (8 Marks)
- b) Explain reasons for naming of the dangerous semicircle in northern hemisphere. (5 Marks)
- c) Explain the correct evasive actions when navigating within 200 NM from center of TRS in the Northern Hemisphere. (7 Marks)
- Q.2)** State the signs which may indicate the proximity of ice on clear night and precautions to be taken when navigating near ice. (20 Marks)
- Q.3)** Describe in details the formation of a gradient current, illustrating the answer with a specific example. (20 Marks)
- Q.4)** Explain in details the reason for abnormal wave around coast of South Africa and the effect of such wave on vessels. (20 Marks)
- Q.5)** Select an area in which sea smoke is a common occurrence and discuss fully why the area you have selected is favorable to its formation. (20 Marks)

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- Q.1)** a) Discuss the conditions necessary for the formation of TRS. (10 Marks)
- b) Identify the factors, which influence the movement of a tropical cyclone and alternative path in northern hemisphere. (10 Marks)
- Q.2)** a) State the various cause of ice accretion on vessel. (8 Marks)
- b) What are the dangers of ice accretion? (8 Marks)
- c) What information should be sent by master on encountering ice accretion on a vessel ? (4 Marks)
- Q.3)** Describe the presentation of data on the following types of current charts and the information which may be derived from each chart:-
- i. Current rose chart (7 Marks)
- ii. Predominant current chart (7 Marks)
- iii. Vector mean current chart (6 Marks)
- Q.4)** a) Discuss diurnal variation of pressure. (10 Marks)
- b) What is the pressure Tendency & its value in meteorology. (10 Marks)
- Q.5)** Select an area in which advection fog is a common occurrence and discuss fully why area you have selected is favorable to its formation. (20 Marks)

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**Q.1)** Describe the factors influencing wind direction on the Earth. Considering rotation of the Earth, centrifugal force and friction. (20 Marks)

**Q.2)** A vessel is in latitude 20 N in the western Atlantic during early September.

The barometer has fallen rapidly and the wind has increased to force 6/7 with NE'ly direction, the radio having warned that there is a T.R.S. in the vicinity

somewhere to the south of the vessel. Course is changed from south to NNE to put the wind on the starboard bow. Subsequently it is noted that the wind,

which has been veering slowly, becomes constant and then backs slightly whilst increasing in force.

**a)** Assess the situation and recommend a course of action. (15 Marks)

**b)** Briefly explain how the Tropical Revolving Storms are categorized. (5 Marks)

**Q.3) a)** On the chartlet provided, show and name the currents of the North Pacific, indicating whether each is cold or warm current. (12 Marks)

**b)** What is the main cause of persistent fog off the Northeastern Japan, mentioning the time of maximum occurrence. (8 Marks)

**Q.4)** What are the causes of formation and decay of sea waves. (20 Marks)

**Q.5)** Write Short notes on the following:

- i) Bergy bit;
- ii) Pancake Ice;
- iii) Glacier;
- iv) Ice shelf.

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***Q.1*** a) What is the geostrophic wind? (6 marks)

b) Describe with the aid of a sketch the forces affecting the surface wind, which blows in the area of an anticyclone in the Northern Hemisphere. (14 marks)

***Q.2*** a) Draw a plan of a TRS showing isobars, wind circulation, path, track, vortex, trough line, dangerous/navigable semicircle/quadrant in northern hemisphere. (8 marks)

b) Explain the reason for the naming of the dangerous semicircle. (5 marks)

c) Elaborate on evasive actions when navigating within 300 NM from center of TRS in the Northern Hemisphere. (7 marks)

***Q.3*** a) with respect to safety of navigation, State the precautions to be taken when navigating near ice, and when ice is suspected in the vicinity. (10 marks)

b) Describe the movement of ice in North Atlantic Ocean. (10 marks)

***Q.4*** Describe formation of "Monsoon" of the North Indian Ocean and its associated weather condition in summer. (20 marks)

***Q.5*** Describe following terms:

(i) Current rose charts

(ii) Synoptic chart

(iii) Cold front

(iv) Tidal current

(5 marks each)