

## MERCHANT SHIPPING SECRETARIAT

## GOVERNMENT OF SRI LANKA CERTIFICATE OF COMPETENCY EXAMINATION

GRADE : CHIEF MATE ON SHIPS OF 500 GT OR MORE (UNLIMITED)

SUBJECT : Marine meteorology DATE : 01<sup>st</sup> February 2018

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) Briefly describe the type, origin, movement and decay of iceburgs found near New Foundland area in North Atlantic.

(10 marks)

- b) Explain following ice terms
  - i. Drift Ice
  - ii. Ice edge

(05 marks each)

c) With reference to the annexed ice chart for New Foundland area, state the prevailing sea ice condition in 50°10'N, 054°30'W.

(10 marks)

2. a) Explain the reasons for formation of equatorial currents and equatorial counter currents.

(05 marks)

- b) Briefly explain the following:
  - i. "Ekman Spiral".
  - ii. Longshore current

(05 marks each)

c) Mark all the major currents in the given map of Pacific Ocean and identify all warm currents.

(15 marks)

- 3. a) A vessel in the outer storm area of a Tropical Revolving Storm in Northern Hemisphere observes True wind direction NE and subsequently changing to NNE and N, Wind force 6 and increasing and steady reduction of atmospheric pressure
  - i. Ascertain the location of the vessel in relation to the centre of the TRS and state what action should be take to avoid the centre.

(20 marks)

ii. Subsequently wind direction commenced to veer and became steady with increasing wind force and continual drop of atmospheric pressure. Explain the reasons for the mentioned change of weather and state whether any change in the action taken above to avoid the centre should be reconsidered.

(20 marks)

- 4. a) Using the provided Surface Analysis chart state the following:
  - i. The current weather in the position 50° 00' N and 010° 00' W.

(10 marks)

ii. Weather forecast for a vessel proceeding west from the above position.

(10 marks)

- b) With reference to 500 mb chart
  - i. Identify "Ridges" and "Troughs" on the chart.

(05 marks)

ii. What is the significance of 5640 m contour on the chart?

(05 marks)

iii. State the outlook (forecast) for two surface low pressures developing in approximately 30°00'N, 175°00'W and 35°00'N, 145°00'W.

(10 marks)

- 5. Write shorts notes on following:
  - a) Significant Wave Height
  - b) Probable wave height
  - c) Vector mean current
  - d) Predominant Current

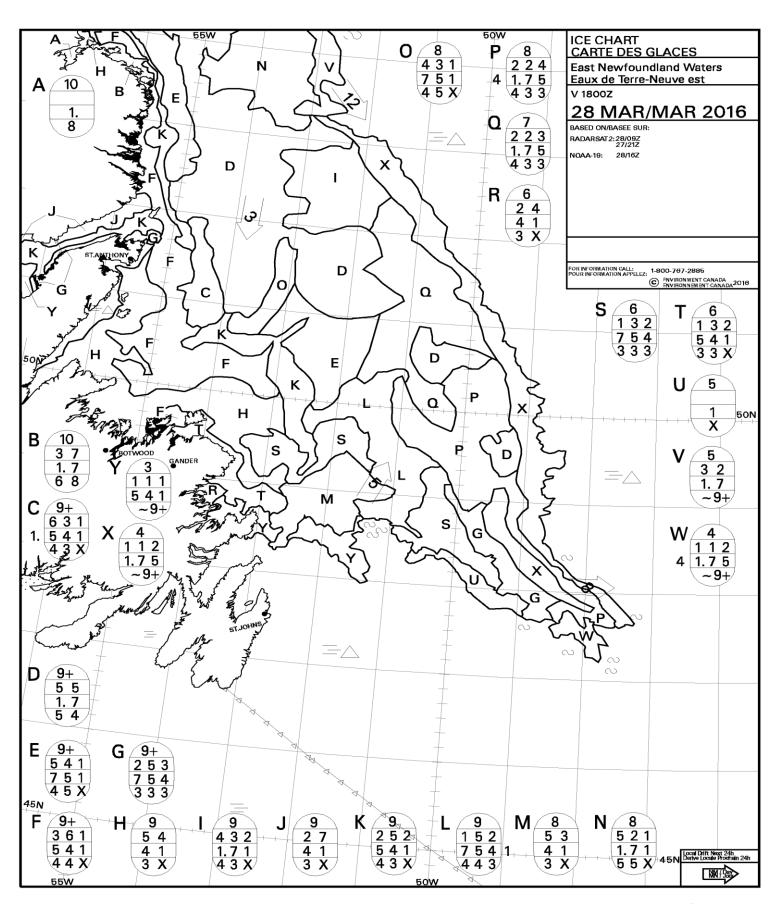
(05 marks each)

- 6. a) Define Following tracks in voyage planning:
  - i. Least time
  - ii. Least time with least damage
  - iii. Constant Speed

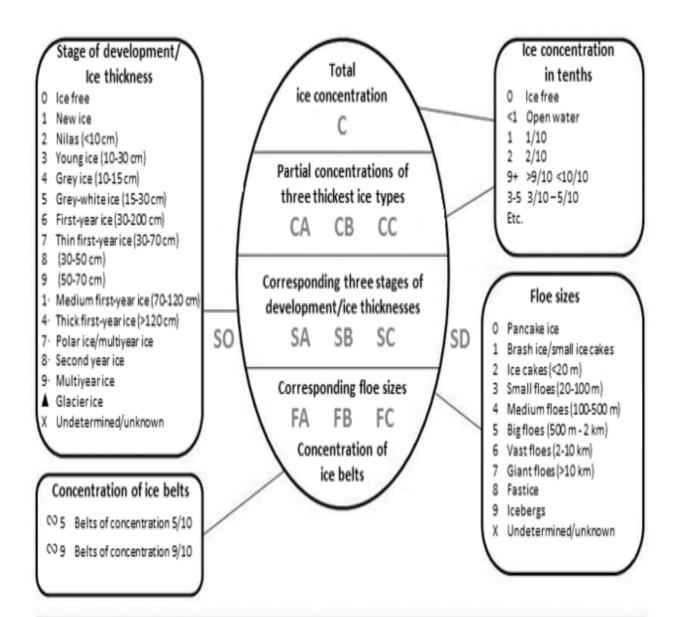
(05 marks each)

b) Briefly explain how to construct a least time track.

(05 marks)

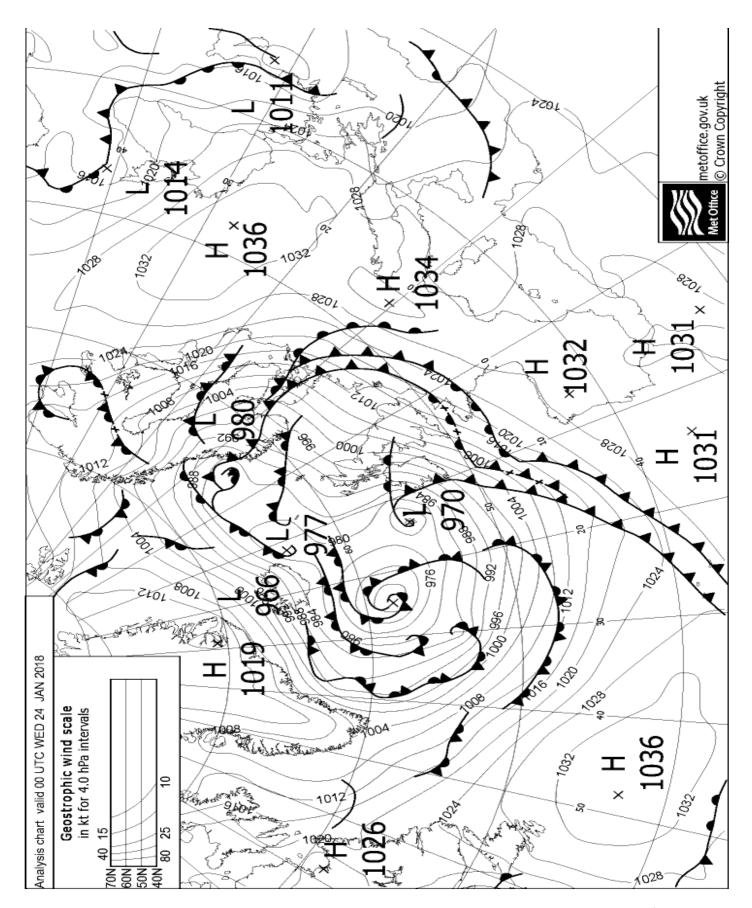


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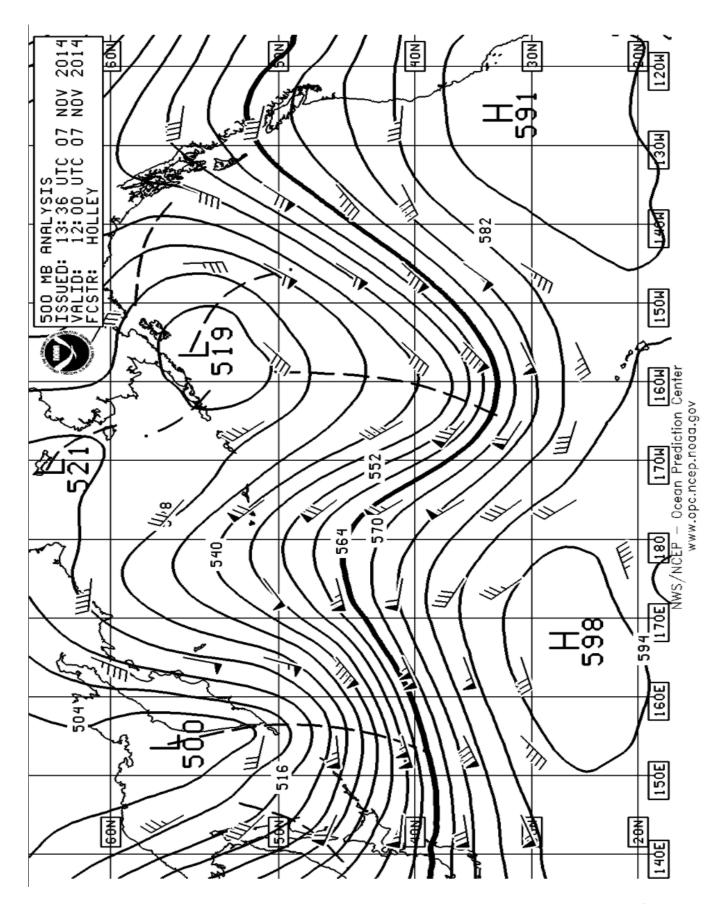


## The ice egg may be supplemented by 2 figures:

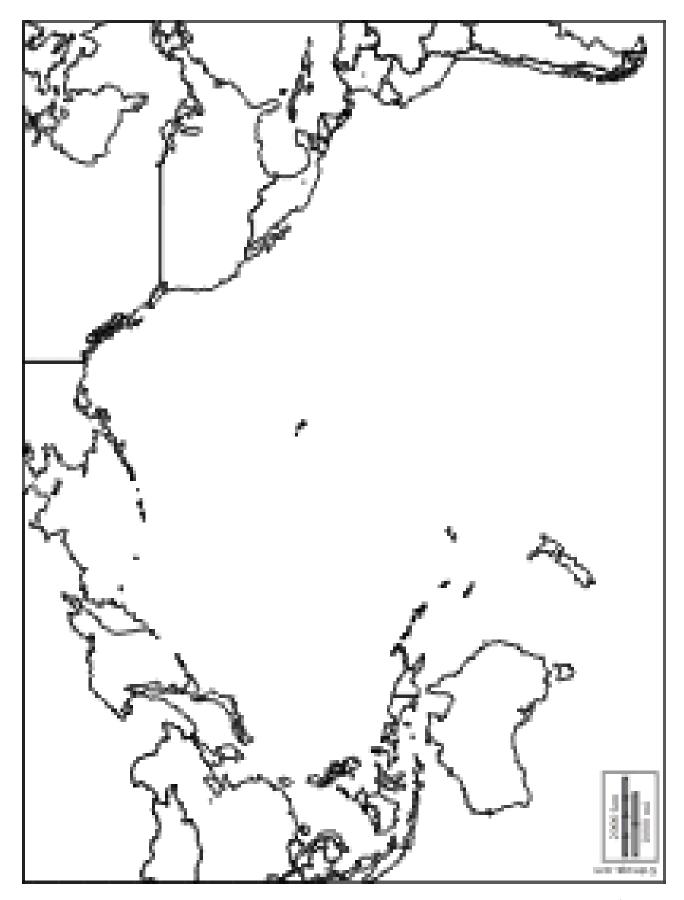
- SO Sporadic (<1/10 concentration) occurences of ice, thicker than indicated inside the egg, may be indicated here.
- SO When all partial ice concentrations inside the egg total considerably less than the total ice concentration C, the stage of development of the predominant of the remaining thinner ice types may be indicated here.



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