



# **FIRST MATE (FG)** **PHASE-I WRITTEN:** **METEOROLOGY (FG)**

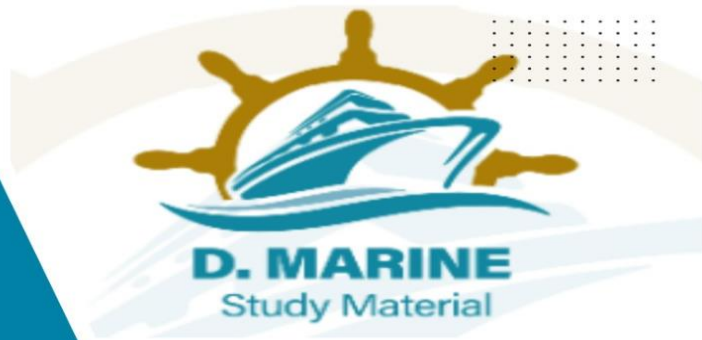
**FOR INDIAN COMPETENCY EXAM**



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Date: - 5th January-2022

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)  
FUNCTION: NAVIGATION (Management Level)  
PAPER: METEOROLOGY

Notes:

1. Question No. 1 is compulsory.
2. Attempt any FOUR questions from the remaining 5 Questions.
3. All questions carry equal marks i.e. 20 marks each.
4. Use Admiralty Tide Tables 1992 Edition (ATT 1992)

Q.1) Find the height of tide for MASQAT (ATT-2) at 0600 hrs on 10th April 1992 using Simplified harmonic constant method.

[Click Here to See the Answer](#)

Q.2) What is TRS? With suitable sketch describe its structure, formation, development and decay. Explain the actions to be taken to avoid the storm center and its vicinity in NH.

[Click Here to See the Answer](#)

Q.3) a) What is an air mass? How are air masses classified?  
b) What will be the effect on weather when an air mass situation over North America moves towards the Atlantic Ocean in summer and winter.

[Click Here to See the Answer](#)

Q.4) Explain the formation of sea ice. Also describe the factors on which the movement of sea ice is dependent upon.

[Click Here to See the Answer](#)

Q.5) Explain main causes of ocean currents. Give example of two warm ocean currents and two cold currents and causes of these currents.

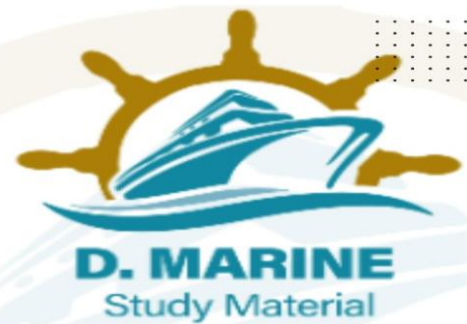
[Click Here to See the Answer](#)

Q.6) Describe optimum routing. How would you achieve the objective of weather routing in optimum routing?

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Date: - 11th March-2022

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)  
FUNCTION: NAVIGATION (Management Level)  
PAPER: METEOROLOGY

Notes:

1. Question No. 1 is compulsory.
2. Attempt any FOUR questions from the remaining 5 Questions.
3. All questions carry equal marks i.e. 20 marks each.
4. Use Admiralty Tide Tables 1992 Edition (ATT 1992)

Q.1) Find the height of tide for Coconut Island (# 5807) at 2030 Hours on 26th February, using shorter method of S.H.

[Click Here to See the Answer](#)

Q.2) Describe the following in respect of Tropical Revolving Storm (TRS):

- a) List the areas of the world where TRS occurs frequently, together with local names of the storms. Mention against each areas the period of the year when TRS generally develop.
- b) Structure of a Tropical Revolving Storm with appropriate diagram.
- c) Which is dangerous semicircle for navigation with reference to a Tropical Revolving Storm? Explain your answer with sketches for both the hemisphere.
- d) If the position of your ship is in the dangerous semicircle of a TRS what action you would take to keep your vessel safe.

[Click Here to See the Answer](#)

Q.3) Write short notes on: (Any Four)

- (a) Cyclostropic Wind
- (b) International Ice Patrol
- (c) Occlusion
- (d) Frontal Fog and Steam Fog
- (e) Frontolysis
- (f) Weather Routing

[Click Here to See the Answer](#)

Q.4) a) What is an iceberg and how it forms?

b) What report you will file on encountering ice at Sea.

[Click Here to See the Answer](#)

Q.5) a) Briefly explain Gradient Current and Up-welling current. Give suitable examples.

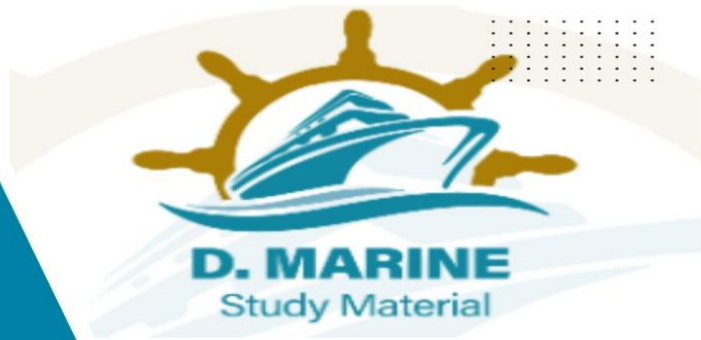
b) What are the current a ship will face in its journey from Liverpool to Cape Town?

c) Describe the current prevailing in Mediterranean Sea and Black Sea. Give necessary





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sketches.

[Click Here to See the Answer](#)

Q.6) a) What is an adiabatic process? Discuss Stability of atmosphere in detail giving suitable sketch.

b) Explain the following:

i) Refraction of Sea Waves.

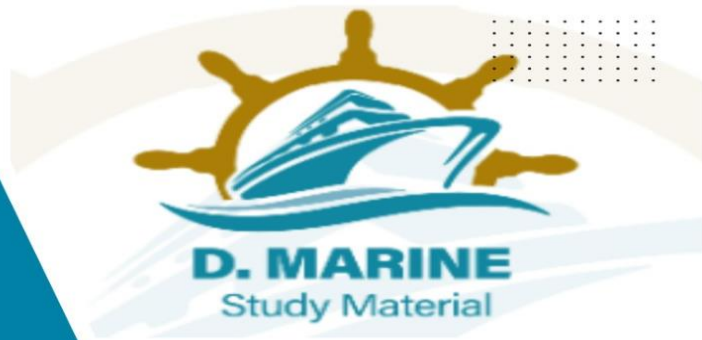
ii) The method of Shipboard weather routing with suitable diagram.

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Date: - 10th May-2022

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)  
FUNCTION: NAVIGATION (Management Level)  
PAPER: METEOROLOGY

Notes:

1. Question No. 1 is compulsory.
2. Attempt any FOUR questions from the remaining 5 Questions.
3. All questions carry equal marks i.e. 20 marks each.
4. Use Admiralty Tide Tables 1992 Edition (ATT 1992)

Q.1) Find the height of tide at Bhavnagar, at 1200 hour on 11th January by simple harmonic method.

[Click Here to See the Answer](#)

Q.2) What factors contribute in formation of a TRS? Describe the avoiding action in northern hemisphere for a ship in (i) in dangerous semicircle (ii) Navigable semicircle

[Click Here to See the Answer](#)

Q.3) Explain the term “air mass” and “front”. With suitable sketches, explain the life cycle of a frontal depression.

[Click Here to See the Answer](#)

Q.4) a) Explain sequence of formation of sea ice.

b) State preparations to be done prior to vessel undertaking navigation through ice.

[Click Here to See the Answer](#)

Q.5) a) Describe how currents are caused.

b) Describe the currents of South Atlantic Ocean.

[Click Here to See the Answer](#)

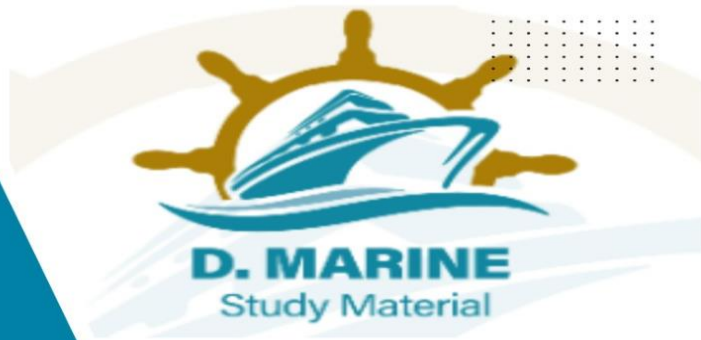
Q.6) Write notes on:

- i) Geostrophic wind
- ii) Gradient wind
- iii) Katabatic wind
- iv) Sea breeze

[Click Here to See the Answer](#)



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Date: - 7th June-2022

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)  
FUNCTION: NAVIGATION (Management Level)  
PAPER: METEOROLOGY

Notes:

1. Question No. 1 is compulsory.
2. Attempt any FOUR questions from the remaining 5 Questions.
3. All questions carry equal marks i.e. 20 marks each.
4. Use Admiralty Tide Tables 1992 Edition (ATT 1992)

Q.1) Find the height of tide at 0000 hrs. GMT on 20th Feb 1992 at Port Adelaide (ATT Vol. III, # 6160) by Simple Harmonic Constant Method.

[Click Here to See the Answer](#)

Q.2) Explain the following terms:-

- a) Explain the formation of sea ice, icebergs in higher latitudes in Northern waters?
- b) Write notes on “Pack Ice” and “Fast Ice”.

[Click Here to See the Answer](#)

Q.3) a) Explain reasons of current.

b) Identify any two major ocean currents and write short notes on them.

[Click Here to See the Answer](#)

Q.4) a) Explain the conditions associated with the formation of TRS and factors affecting movement of TRS?

b) What are the warning signs of an approaching TRS?

[Click Here to See the Answer](#)

Q.5) Write notes on following:

- a) Coriolis Force
- b) ITCZ
- c) Pressure Gradient

[Click Here to See the Answer](#)

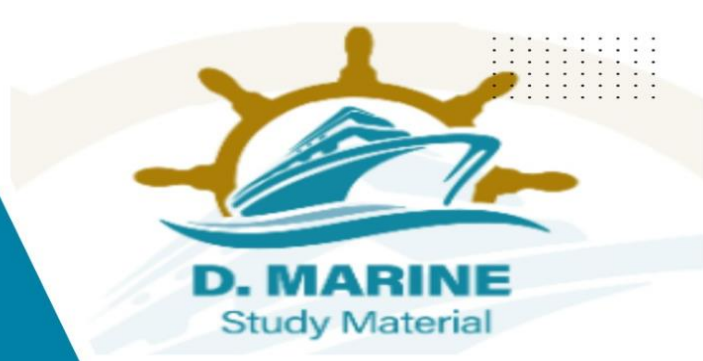
Q.6) Write notes on:

- a) List different types of FOG.
- b) Explain why there is persistent fog off the Grand banks of Newfoundland.

[Click Here to See the Answer](#)



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Date: - 13th July-2022

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)  
FUNCTION: NAVIGATION (Management Level)  
PAPER: METEOROLOGY

Notes:

1. Question No. 1 is compulsory.
2. Attempt any FOUR questions from the remaining 5 Questions.
3. All questions carry equal marks i.e. 20 marks each.
4. Use Admiralty Tide Tables 1992 Edition (ATT 1992)

Q.1) Find out the earliest time on AM 25th March 1992, so that a ship of maximum draft 6.5 mtr can sail out, keeping an UKC of 1.5 mtr, while passing over shoal (depth marked 4.2 mtr on chart) at West Port (# 2905).

[Click Here to See the Answer](#)

Q.2) Describe the following in respect to Tropical Revolving Storm (TRS):

- a) Why ITCZ cannot be termed as an Equatorial Front or Inter-tropical front.
- b) What is the reason for fewer occurrences of T.R.S. formation in South Atlantic and eastern part of South Pacific?
- c) What are the condition necessary for formation of TRS.

If the position of your ship is in the dangerous semicircle of a TRS what action you would take to keep your vessel safe.

[Click Here to See the Answer](#)

Q.3) Write short notes (Any Five)

- (i) Col. (ii) Semi-diurnal Variation of Atmospheric Pressure
- (iii) Advection Fog
- (iv) Thunderstorm
- (v) Fohn Wind Effect
- (vi) Families of Depression

[Click Here to See the Answer](#)

Q.4) a) Types and formation of floating ice encountered in sea.

b) Write a short note on International Ice Patrol

c) Discuss with suitable sketches the normal seasons and probable tracks of North Atlantic Ice Bergs.

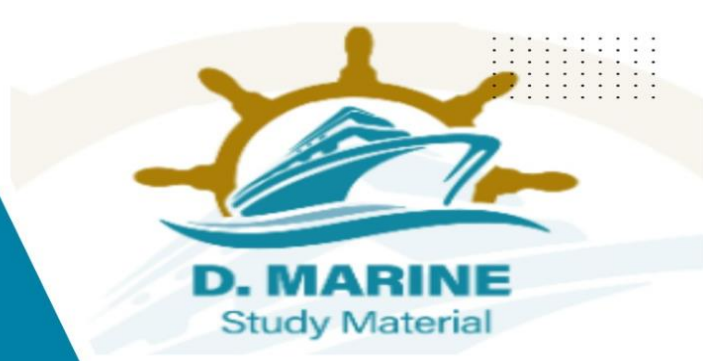
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Q.5) a) What are the causes of Ocean Currents?

b) Describe the current circulation through the strait of Gibraltar.



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c) Describe the current circulation in Bay of Bengal during SW Monsoon and NE Monsoon.

d) Eastern shore of large Ocean are prone to which currents? Give some examples.

[Click Here to See the Answer](#)

Q.6) a) Describe briefly the importance of weather routing discussing the factors that are taken into consideration for weather routing.

b) What are the limitations of weather routing?

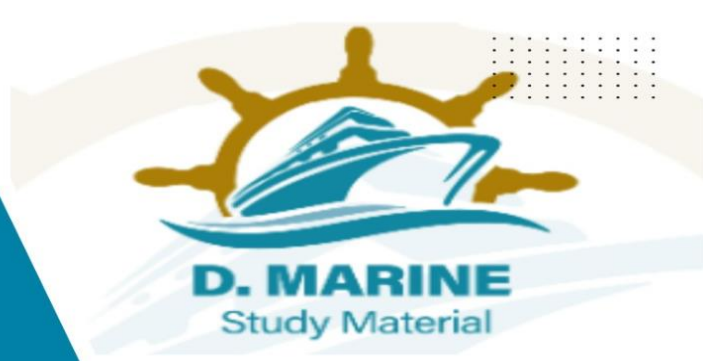
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Date: - 2nd Aug-2022

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)  
FUNCTION: NAVIGATION (Management Level)  
PAPER: METEOROLOGY

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Notes:

1. Question No. 1 is compulsory.
  2. Attempt any FOUR questions from the remaining 5 Questions.
  3. All questions carry equal marks i.e. 20 marks each.
  4. Use Admiralty Tide Tables 1992 Edition (ATT 1992)
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Q.1) Find the height of tide at 1930 hrs for Boom (ATT vol. I # 1539 c) on 5th Feb 1992.

[Click Here to See the Answer](#)

Q.2) Describe in detail (with the help of a neat sketch) the conditions and values of lapse rates, which lead to stability / instability of atmosphere.

[Click Here to See the Answer](#)

Q.3) a) List the area and seasons in which sea fog is to be expected. Explain how the occurrence of sea fog can be predicted on board ship.

b) Describe the effect of wind blowing over a long coastline and how this influences the currents in the South Pacific Ocean.

[Click Here to See the Answer](#)

Q.4) Write short notes on following:

- a) Depletion of ozone layer and its impact on environment.
- b) Frontolysis and its significance to the mariner.

[Click Here to See the Answer](#)

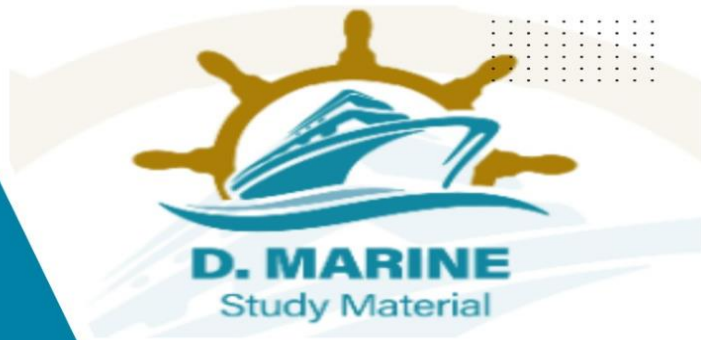
Q.5) i) Explain

- a) Trough
  - b) Crest
  - c) Wave Length
  - d) Wave Height
- ii) Explain briefly
- a) Drift Current
  - b) Upwelling Current
  - c) Gradient Current

[Click Here to See the Answer](#)



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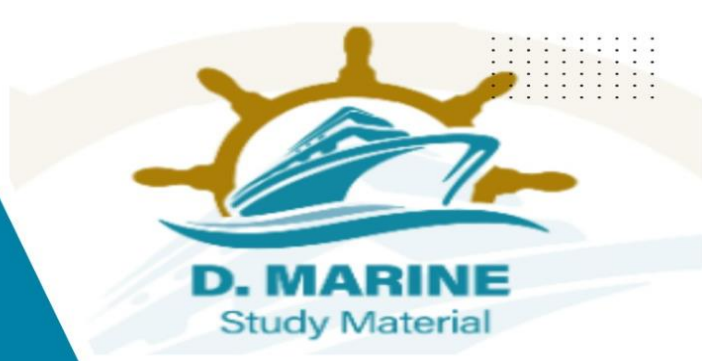
Q.6) Describe various types of Weather Facsimile Charts / Weather related information available to the mariner. How are these charts used for Weather Routeing purpose? What do you understand by Vessel's performance curves and their use.

[Click Here to See the Answer](#)





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Date: - 15th Sept-2022

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)  
FUNCTION: NAVIGATION (Management Level)  
PAPER: METEOROLOGY

Notes:

1. Question No. 1 is compulsory.
2. Attempt any FOUR questions from the remaining 5 Questions.
3. All questions carry equal marks i.e. 20 marks each.
4. Use Admiralty Tide Tables 1992 Edition (ATT 1992)

Q.1) Find the Height of tide @ BHAVNAGAR (# 4346) on 05th February 1992 and 1200 hours SHM.

[Click Here to See the Answer](#)

Q.2) a) Explain condition associated with formation of a Tropical Revolving Storm.  
b) Sketch and describe isobars and wind circulation in a depression.

[Click Here to See the Answer](#)

Q.3) a) Describe the characteristics and location of Trade Winds.  
b) Describe the causes of Global Warming and its effect on changes in weather pattern.

[Click Here to See the Answer](#)

Q.4) a) Explain the formation of sea ice.  
b) State the limitation of radar as a means of detecting ice.

[Click Here to See the Answer](#)

Q.5) a) List the information given in Shipping Forecast issued for coastal areas.  
b) Explain the cause of Gradient Current.

[Click Here to See the Answer](#)

Q.6) a) Define:

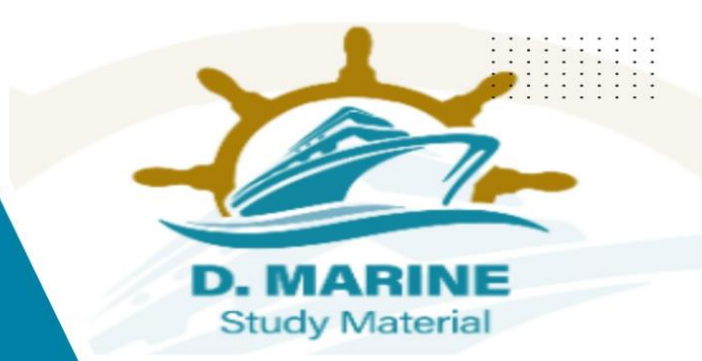
- i) Significant Wave height and
- ii) Fetch.

b) Explain the factors to be taken into consideration in ship's weather routeing.

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Date: - 7th Nov-2022

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)  
FUNCTION: NAVIGATION (Management Level)  
PAPER: METEOROLOGY

Notes:

1. Question No. 1 is compulsory.
2. Attempt any FOUR questions from the remaining 5 Questions.
3. All questions carry equal marks i.e. 20 marks each.
4. Use Admiralty Tide Tables 1992 Edition (ATT 1992)

Q.1) Using Simplified Harmonic Constant Method find height of tide at Hoek Van Holand (No. 1505, ATT Vol. 1) at 0800 hours on 13th March 1992.

[Click Here to See the Answer](#)

Q.2) a) How is an Aneroid Barometer useful in detecting a T.R.S?  
b) Describe the practical rules for avoiding eye of a TRS in the southern hemisphere. Support your answer with neat sketches.

[Click Here to See the Answer](#)

Q.3) a) Discuss about the various types of ocean currents?  
b) 'Frontal Depressions are encountered in a row'. Justify your answer with the help of suitable sketches.

[Click Here to See the Answer](#)

Q.4) a) Briefly explain the formation of sea ice, icebergs in higher latitudes in Northern Waters?

b) Explain the purpose, duties and responsibilities of International Ice Patrol?

[Click Here to See the Answer](#)

Q.5) a) Explain with sketches, the formation of Benguela current on the West coast of Africa.

b) Explain with reason the flow of surface & under current in strait of Gibraltar.

[Click Here to See the Answer](#)

Q.6) a) Describe various types of weather facsimile charts / weather related information available to the mariner. How are these charts used for weather routing purpose?

b) What do you understand by vessel's performance curves and their use?

[Click Here to See the Answer](#)





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