(Paper Format)

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)

FUNCTION: NAVIGATION (Management Level)

PAPER: METEOROLOGY

TIME: 2 Hours PASS MARKS: 50 MAX. MARKS: 100

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 Tide calculations for Standard Port and Secondary Port (including shorter method of harmonic method)

Q.2 Tropical Revolving Storm (TRS)

Q.3 Climatology/ Frontal / Non Frontal depressions

Q.4 Ice/ Atmosphere

Q.5 Ocean Currents/ Waves

Q.6 Weather Forecasting/ Weather Routeing

Please note that the above format is only an indicative of the examination paper. The candidates are advised to refer to detailed teaching syllabus and the course outline.

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GOVERNMENT OF INDIA

PM Paper **Date: - 9th Jan-2025**

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 1330h on 14/2/92 at Sunday Is.

Q.2) (a) State the various factors favourable for the formation of TRS.

(b) Draw the isobaric pattern of a well-developed TRS.

(c) Define Dangerous Semi-circle and Navigable Semi-circle in the Northern and Southern Hemisphere. Why are they so called?

Q.3) Write short notes on:

(a) Geostrophic Winds.

(b) Absolute Instability of Air.

(c) Refraction of Sea Waves.

(d) Warm & Cold Front.

Q.4) Describe the life span of Arctic region Icebergs. Describe the function of International Ice Patrol.

Q.5) (a) Explain:

(i) Trough (ii) Crest (iii) Wave Length (iv) Wave Height

(b) Explain briefly:

(i) Drift Current (ii) Upwelling Current (iii) Gradient Current

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

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GOVERNMENT OF INDIA

AM PAPER **Date: - 9th Jan-2025**

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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) Calculate by Simple Harmonic short method, the height of tide at port Adelaide (Outer Harbour) on 20th February 1992 at 0930 hrs. L.T.

Q.2) (a) Describe with a neat sketch typical path of a T.R.S in southern hemisphere. Why does a TRS not always follow such a track?

(b) State the regulation given in SOLAS regarding reporting a TRS & list the information which must be included in such a report.

Q.3 (a) Describe the characteristics and weather associated with various types of clouds?

(b) Briefly describe the cause and effects of Global warming?

Q.4 (a) Write short notes on Diurnal variation of temperature and atmospheric pressure?

(b) Describe the factors which may give rise to ice accretion and methods of reducing ice accretion.

Q.5 (a) Explain with help of a suitable diagram the sequential formation of sea ice.

(b) Describe the cause of formation of Kuroshio Current in North Pacific Ocean.

Q.6 What is Ship Weather Routeing? Write its objectives. Also write the process of carrying out Weather Routeing.

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GOVERNMENT OF INDIA

PM Paper **Date: - 4th Oct-2024**

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 1930 hrs for Boom (ATT Vol. 1 # 1539 c) on 05th Feb 1992..

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

Q.3) i) Explain the formation of sea ice.

ii) State the limitations of radar as a means of detecting ice.

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.

Q.5) Describe with suitable sketch the Ocean currents of North Atlantic Ocean. Identify the warm and cold currents.

Q.6) a) Describe Significant wave height and fetch.

b) Explain the method of Shipboard weather routing with suitable diagrams.

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GOVERNMENT OF INDIA

AM PAPER **Date: - 4th Oct-2024**

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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.

Q.2) a) Explain conditions associated with formation of a Tropical Revolving Storm.

b) Sketch and describe isobars and wind circulation in a depression.

Q.3 a) Write short notes on:

i) Synoptic charts ii) Wave nomogram

b) Describe in details Frontogenesis with suitable sketches.

Q.4 a) Explain with sketches, the formation of Benguela Current on the West coast of Africa.

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

Q.5 a) List the information given in Shipping Forecast issued for coastal areas.

b) Explain the cause of Gradient Current.

Q.6 Your ship, a bulk carrier, carrying steel cargo is due to sail from Southampton to New York in the month of December. What all are the factors you will consider regarding weather routeing for your passage across the Atlantic Ocean?

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GOVERNMENT OF INDIA

PM Paper **Date: - 10th July-2024**

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 0230 hours LT on 9th January 1992 at port Apollo bandar (No. 4359 ATT-II) by simple harmonic method.

Q.2) a) State the typical signs of an approaching TRS and describe the messages required to be sent as per SOLAS.

b) What action to be taken if vessel in southern hemisphere is in the path of the storm and presently experiencing winds BF scale 5. Assume navigable waters all around.

Q.3) Write short notes on:

i) Air mass types

ii) Types of clouds associated with warm front of a TLD.

iii) Global warming.

Q.4) Explain the precautions to be taken when navigating in or near an area affected by sea ice.

Q.5) Describe with suitable sketch the Ocean currents of North Atlantic Ocean. Identify the warm and cold currents.

Q.6) a) Describe Significant wave height and fetch.

b) Explain the method of Shipboard weather routing with suitable diagrams.

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GOVERNMENT OF INDIA

AM PAPER **Date: - 10th July-2024**

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 (#4346) on 9th Feb'92 @ 1200 hrs by Harmonic Constant Method.

Q.2) a) Explain Buy's Ballots Law, Veering and Backing.

b) Give signs of approaching TRS.

c) State your actions to avoid getting closer to the eye of TRS if you were in Southern Hemisphere.

Q.3) a) Describe the effects of global warning?

b) Describe the characteristic and weather associated with the following types of clouds:

i) Altocumulus ii) Nimbostratus iii) Cumulonimbus

Q.4) a) What do you understand by "Ice Accumulation"?

b) What precautions would you take to minimize ice accumulation on board?

Q.5) What are the primary factors influencing the motion of surface currents. What is the indirect effect of wind on the surface currents & how do they affect the strength of currents as well as local climate?

Q.6) Your ship, a bulk carrier, carrying steel cargo is due to sail from Southampton to New York in the month of December. What all are the factors you will consider regarding weather routeing if your passage across the Atlantic Ocean?

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GOVERNMENT OF INDIA

Date: - 4th April-2024

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 2130 hours LT on 11th February 1992 at port Bhavnagar (No.4346 ATT-II) by simple harmonic method.

Q.2) a) Give the names of the TRS in different parts of the world.

b) Explain action to be taken if vessel is inside dangerous quadrant in the northern hemisphere.

Q.3) a) Write short notes on:

i) Synoptic charts

ii) Wave nomogram

b) Describe in details Frontogenesis with suitable sketches.

Q.4) a) Discuss with the aid of suitable sketches the normal season and probable movement of North Atlantic Icebergs from birth to decay.

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

Q.5) a) Sketch and describe the currents of the South Indian Ocean. Also identify the warm and cold currents.

b) Describe the various forms of depicting ocean currents on charts.

Q.6) a) Describe optimum routing and explain the methods used onboard ship for weather routing.

b) Describe significant wave height and the factors that influence the height of wave.

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GOVERNMENT OF INDIA

Paper 2 **Date: - 10th Jan-2024**

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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) Calculate height of tide at 1136 hrs LT on 29th March 1992 at Ramsgate (#102).

Q.2) a) Explain the structure of a tropical revolving storm with a neat sketch. Describe the weather conditions associated with the 'eye' and 'eye wall'.

b) Describe the practical rules for avoiding eye of a TRS in the southern hemisphere. Support your answer with neat sketches.

Q.3) Write short notes on following:

a) Depletion of ozone layer and its impact on environment.

b) Frontogenesis and Frontolysis and its significance to the mariner.

Q.4) a) Write short notes on:

i) Temperature Inversion ii) Radiation Fog

b) Describe the function of International Ice Patrol.

Q.5) a) Describe the surface current circulation in the North Atlantic Ocean along with the causes of formation of these currents.

b) How is a frontal depression formed? What is the weather associate with a warm front?

Q.6) a) Enumerate the factors to be taken into consideration for ship's weather routeing?

b) Discuss how weather routing helps in the safe navigation of the vessel.

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GOVERNMENT OF INDIA

Paper 1 **Date: - 10th Jan-2024**

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 0800 hrs. L.T. on 19th April 1992 at port Sultanpur (No. 4344 ATT-II) by simple harmonic method.

Q.2) a) With respect to a TRS explain:

i) Tropical depression
ii) Path
iii) Eye wall
iv) Navigable quadrant
v) Vertical wind shear
vi) Characteristic and Alternate path

b) What action to be taken if vessel is inside navigable quadrant in the southern hemisphere.

Q.3) Write short notes on:

i) Prognostic charts
ii) Wave refraction
iii) Frontolysis

Q.4) Describe the various stages in the development of sea ice by making use of a block diagram.

Q.5) Describe with suitable sketch the Ocean currents of North and South Pacific Ocean. Also identify the warm and cold currents.

Q.6) Identify the various types of weather routing services available for shipping and describe any one of them.

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GOVERNMENT OF INDIA

Paper 2 **Date: - 9th Oct-2023**

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 only simplified Harmonic Constant method find the Height of Tide at 0000 hrs. GMT on 20th February'92 at Port Adelaide. (Outer Harbor) (ATT. Vol 3 # 6160)

Q.2) a) What are the causes for curving and re-curving of TRS?

b) Why does the speed of TRS increase after re-curving?

c) Describe the evasive action, which should be taken by a vessel while in a TRS in NH.

Q.3) a) What are the caused and effects of Global Warming? How it is affecting the change in the weather?

b) Describe the weather associated with the passage of warm front and Occluded front.

Q.4) Write short notes on the following:

a) Cold front and weather associated with it.

b) Adjustment of isobars to fronts in weather forecasting.

c) Sea fog and method of forecasting on board.

Q.5) a) Explain with diagram any two types of charting of ocean current.

b) How does the ocean current charts help the mariners?

Q.6) a) Describe the procedures for climatological routeing.

b) Explain the purpose for Maritime Forecast Code and data given by MARFOR.

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GOVERNMENT OF INDIA

Paper 1 **Date: - 9th Oct-2023**

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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) Calculate the height of tide at Esposende (#1731) on 15th Jan 1992 at 0754 hrs.

Q.2) a) Describe the warning signs which could indicate the approach of a Tropical Revolving Storm.

b) Explain how weather routing can be done on board a vessel? Discuss the advantages of weather routing.

Q.3) a) Discuss in details the different types of clouds.

b) List the areas and seasons in which sea frog is to be expected. Explain how the occurrence of sea fog can be predicted on board ship.

Q.4) a) What are the factors which may lead to ice accretion on ship? What are the dangers associated with it.

b) Describe the function of International Ice Patrol.

Q.5) a) Write short notes on:

i) Storm surge ii) tsunami iii) freak waves

Q.6) Write short notes on (with neat diagrams)

a) Isallobars b) Atmospheric pressure RIDGE

c) Geostrophic wind d) Diurnal variation of atmospheric pressure.

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GOVERNMENT OF INDIA

Date: - 10th July-2023

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 (# 4346) on 9th Feb'92 @ 1200 hrs. by Harmonic Constant Method.

Q.2) Describe the following with respect to TRS:

i) Conditions favorable for its formation

ii) Structure of a TRS and

iii) Avoiding action to be taken if you are in the right hand semi-circle of a TRS in Northern Hemisphere.

Q.3) a) Describe the effects of global warming?

b) Describe the characteristics and weather associated with the following types of clouds:

i) Altocumulus ii) Nimbostratus iii) Cumulonimbus

Q.4) a) Explain the formation of icebergs from floating glaciers, ice shelf and characteristics of each.

b) What is the International Ice Patrol?

Q.5) a) Define wave, length and period of wave. State the relationship between them.

b) Explain the factors which causes drift current and gradient current.

Q.6) a) Describe the method of weather routeing using forecast data.

b) Describe the information which can be used from routeing charts, sailing directions and Mariner's Handbook for weather routeing.

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GOVERNMENT OF INDIA

Date: - 12th April-2023

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 predicted height of tide by Simple Harmonic Constant Method at 0518 hrs. LT on 23rd April 1992 at HONGKONG, Port No. 7110 (ATT Vol.III).

Q.2) a) Explain Buy's Ballots Law, Veering and Backing.

b) Give signs of approaching TRS.

c) State your actions to avoid getting closer to the eye of TRS if you were in Southern Hemisphere.

Q.3) a) Explain the process of frontogenesis.

b) Write short notes on: i) Occluded Front ii) Geostrophic Wind

Q.4) a) What do you understand by "Ice Accumulation"?

b) What precautions would you take to minimize ice accumulation on board?

Q.5) What are the primary influencing the motion of surface currents. What is the indirect effect of wind on the surface currents & how do they affect the strength of currents as well as local climate?

Q.6) Your ship, a bulk carrier, carrying steel cargo is due to sail from Southampton to New York in the month of December. What all are the factors you will consider regarding weather routeing for your passage across the Atlantic Ocean?

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GOVERNMENT OF INDIA

Date: - 9th Jan-2023

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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) Calculate by shorter method S.H.M., height of tide at Good's Island (ATT 3) on 20th Jan 1992 at 1300 hrs.

Q.2) a) What are the conditions associated with the formation as well as movement of TRS in Northern and Southern Hemispheres.

b) Explain the evasive actions to be taken by own vessel in the path of a TRS in Southern Hemisphere.

Q.3) Define surface analysis and prognosis charts. Explain how you would use these charts for:

i) Determination of surface winds

ii) Forecasting the movements of fronts

iii) Forecasting of sea fog.

Q.4) What do you understand by Fast Ice & Pack Ice? Explain with help of a sketch the different manners in which river water (fresh water) and sea water (salt water) freeze as air temperature falls.

Q.5) Define speed, period, length and significant wave height. What is their relationship? What are the factors governing wave height and direction.

Q.6) State the differences between weather routeing and climatologically routeing.

Explain how you will carry out weather routeing on board your vessel.

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GOVERNMENT OF INDIA

Date: - 7th Nov-2022

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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.

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.

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.

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?

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.

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

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

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GOVERNMENT OF INDIA

Date: - 15th Sept-2022

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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.

Q.2) a) Explain condition associated with formation of a Tropical Revolving Storm.

b) Sketch and describe isobars and wind circulation in a depression.

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.

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

b) State the limitation of radar as a means of detecting ice.

Q.5) a) List the information given in Shipping Forecast issued for coastal areas.

b) Explain the cause of Gradient Current.

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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GOVERNMENT OF INDIA

Date: - 2nd Aug-2022

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 1930 hrs for Boom (ATT vol. I # 1539 c) on 5th Feb 1992.

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.

Q.3) a) List the area and seasons in which sea fog is to be expected. Explain how the occurrence of sea for 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.

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.

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

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.

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GOVERNMENT OF INDIA

Date: - 13th July-2022

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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).

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.

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

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.

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

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

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.

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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GOVERNMENT OF INDIA

Date: - 7th June-2022

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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.

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”.

Q.3) a) Explain reasons of current.

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

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?

Q.5) Write notes on following:

a) Coriolis Force

b) ITCZ

c) Pressure Gradient

Q.6) Write notes on:

a) List different types of FOG.

b) Explain why there is persistent fog off the Grand banks of Newfoundland.

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GOVERNMENT OF INDIA

Date: - 10th May-2022

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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.

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

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

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

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

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

b) Describe the currents of South Atlantic Ocean.

Q.6) Write notes on:

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

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GOVERNMENT OF INDIA

Date: - 11th March-2022

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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.

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.

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

Q.4) a) What is an iceberg and how it forms?
b) What report you will file on encountering ice at Sea.

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 sketches.

Q.6) a) What is an adiabetic 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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GOVERNMENT OF INDIA

Date: - 5th January-2022

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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.

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.

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.

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

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

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

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GOVERNMENT OF INDIA

Date: - 12th November-2021

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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) Calculate by Simple Harmonic short method, the height of tide at port Adeliade (Outer Harbour) on 20th February 1992 at 0930 hrs. LT.

Q.2) a) State the various factors favorable for the formation of TRS.
b) Draw the isobaric pattern of a well-developed TRS.
c) Define Dangerous Semi-circle and Navigable Semi-circle in the Northern and Southern Hemisphere. Why are they so called?

Q.3) Write short notes on:
a) Synoptic Charts
b) Prognosis Charts
c) Wave Charts

Q.4) a) Give a graphical representation of how atmospheric temperature varies with height in different layers of atmosphere.
b) With the help of a sketch, explain "General distribution of surface temperature and atmospheric pressure" on Earth's surface.

Q.5) Write short notes on:
a) Geostrophic Wind
b) Coriolis Force
c) Ocean current due to upwelling
d) Significant wave height

Q.6) What is Ship Weather Routeing? Write its objectives. Also write the process of carrying out Weather Routeing.

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GOVERNMENT OF INDIA

Date: - 6th Sept-2021

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 sultanpur (No. 4344 ATT-2) at 0900 hours local time on 19th April 1992 by simple harmonic constant method.

Q.2) With respect to Tropical Resolving Storm (TRS) explain the following:
a) Why do TRS usually form on the Western extremities of the ocean?
b) What are the reasons for naming of dangerous quadrant?

Q.3) a) Define family of depressions.
b) Describe characteristics and weather associated with Cumulonimbus clouds.

Q.4) a) Describe the factors which may give rise to ice accretion on ships.
b) Explain adiabatic processes in atmosphere.

Q.5) a) Explain with a suitable example upwelling current and its effect on weather.
b) List the information given in Wave Charts.

Q.6) a) Describe Ship's Performance Curves and their use in ship's weather routeing.
b) List the information given in Synoptic Weather Chart.

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GOVERNMENT OF INDIA

Date: - 8th July-2021

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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) Determine the height of tide at Bombay (ATT II - 4359) at 1200 hrs. IST on 15th January 1992 using shorter method of SHM of tidal prediction.

Q.2) a) With respect to as TRS explain:

i) Track ii) Path iii) Trough iv) Vertex
v) Dangerous Semi Circle vi) Dangerous Quadrant

b) Action to be taken when the approach of TRS is confirmed.

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.

Q.4) Describe in detail (with the help of a neat sketch) the conditions and values of lapse rates, which lead to stability / instability of atmosphere.

Q.5) Explain methods of estimating wave heights and wave periods. What is significant height and maximum Height? Explain the shallow water effects on a wave when it is approaching a coast line.

Q.6) Describe optimum routing and explain the methods used on board ship for weather routing.

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GOVERNMENT OF INDIA

Date: - 5th March-2021

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 Cape town harbor on 6th March 1992 at 0830 Lt by Harmonic constant method?

Q.2) a) State the names of TRS in various oceans.
b) What are the conditions favorable for formation of TRS?
c) Why does the speed of TRS increase after recurving?
d) Describe EYE avoiding action with sketches in a TRS in NH.

Q.3) a) State the causes of Southwest Monsoon in the Arabian Sea. What effect does it have on the general surface current circulation in the Arabian Sea?

b) Describe the effect that the rotation of earth has on ocean currents. Why is the direction of the surface current in any particular area parallel to the isobars there?

Q.4) What is Ship Weather Routeing? Write its objectives. Also write the process of carrying out this Weather Routeing.

Q.5) What is atmosphere? Write its constituents and structure.
Atmosphere remains in contact with the earth's surface – explain how.

Q.6) a) What is ice accretion? What are the conditions when this can occur on board?
b) What are the duties of Master when such conditions are encountered at sea?

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GOVERNMENT OF INDIA

Date: - 15th December-2020

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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) A vessel is scheduled to pass under high tension cables in OOSTENDE (ATT 1No. 1564) at 1230 hrs and on 20th Feb 1992. The charted depth under the cables is 6.20m and their height above MHWS is shown as 20.40m.
The vessel's draft is expected to be 8.5m even keel and the highest point of the ship is 28.5 cm above the keel. Determine her UKC and overhead clearance.

Q.2) a) Explain the conditions associated with formation of TRS and factors affecting movement of TRS?
b) You are bound from Amsterdam to the West Indies and you receive weather bulletin and visual warning of hurricane moving N.E., and that its center will pass over or near your position. State what action you would take, giving your reasons.

Q.3) a) Explain why ITCZ cannot be termed as an Equatorial front or an Inter-tropical front.
b) "Frontal Depressions are encountered in a row". Justify your answer with the help of suitable sketches.

Q.4) a) Explain the three mechanisms of ice accretion on board a ship.
b) How do icebergs of the northern hemisphere form and decay?

Q.5) a) Briefly explain 'gradient current' and 'up-welling current'?
b) Give a brief description of the currents in the Arabian Sea for January and July. Explain the reasons for the difference during these months?

Q.6) a) Describe the weather routeing services available to shipping?
b) List out various information given in weather fax charts and wave charts?

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GOVERNMENT OF INDIA

Date: - 16th October-2020

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 1330 hrs. on 4th Feb 1992 at DERBY (No. 6278, ATT - III) by Simple Harmonic Method.

Q.2) a) With respect to a TRS explain:
- i) Track
- ii) Path
- iii) Trough
- iv) Vertex
- v) Dangerous semi-circle
- vi) Dangerous quadrant

b) Action to be taken when the approach of TRS is confirmed.

Q.3) Write short notes on:
- i) Synoptic Charts
- ii) Prognosis Charts
- iii) Wave Charts

Q.4) a) Explain: i) Save Chart ii) MAFOR Chart iii) Significant wave height
b) Explain wind rose chart.

Q.5) Write short notes on the following:
- i) Isobars
- ii) Vector mean current
- iii) Global warming
- iv) Corona

Q.6) Describe optimum routing and explain the methods used on board ship for weather routing.

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GOVERNMENT OF INDIA

Date: - 9th January-2020

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 and Cape Town Harbour on 06th March 1992 on 083 hrs. LT by SHM.

Q.2) Describe with neat sketch typical path of a tropical revolving storm. Explain the action to be taken if vessel is in dangerous semi-circle in Northern Hemisphere.

Q.3) a) Describe the formation of 'non-frontal' depression.

b) Write notes on: i) Geotropic Wind and ii) Cyclostrophic wind.

Q.4) Explain how sea ice is formed. How is sea ice different from icebergs?

Q.5) What are the various type of ocean currents and how they are found?

Q.6) a) Discuss the process of weather routing of ships.

b) Describe in stages formation of a frontal depression.

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GOVERNMENT OF INDIA

Date: - 3rd Oct-2019

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 times and heights of high and low waters at Boom (#1539c) on 24th February 1992. From the above data, find the height of tide at 1800 hour local time.

Q.2) a) Describe with a neat sketch typical path of a T.R.S. in southern hemisphere. Why does a TRS not always follow such a track?
b) State the regulation given in SOLAS regarding reporting a TRS & list the information which must be included in such a report.

Q.3) a) Describe the characteristics and weather associated with various types of clouds?
b) Briefly describe the cause and effects of Global warming?

Q.4) a) Write short notes on Diurnal variation of temperature and atmospheric pressure.
b) Describe the factors which may give rise to ice accretion and methods of reducing ice accretion.

Q.5) a) Explain with help of a suitable diagram the sequential formation of sea ice.
b) Describe the cause of formation of Kuroshio Current in North Pacific Ocean.

Q.6) a) What are the advantages of ship's weather routeing?
b) Enumerate the factors to be taken into consideration for ships weather routing.

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GOVERNMENT OF INDIA

Date: - 4th July-2019

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 the harmonic constant method find the height of tide at 0430 hrs on 2nd Jan 1992 at VLISSINGEN (FLUSHING)?

Q.2) What are the objectives of Ship Weather Routeing? Describe the method of the shipboard weather routeing taking an appropriate example.

Q.3) Write short notes on:
(a) Buys Ballot's Law (b) Absolute instability of Air (c) International Ice Petrol

Q.4) What are surface analysis and prognosis charts? By using these charts how will you carry out the following: (a) Determination of Surface Winds, (b) Forecasting of Sea Fog

Q.5) (a) Describe the structure of a TRS with a neat sketch. What type of weather in associated with 'EYE' and 'EYE WALL' of a TRS.
(b) Describe the practical rules for avoiding eye of a TRS in the southern Hemisphere. Support your answer with neat sketches.

Q.6) Describe the surface current circulation in the North Atlantic Ocean along with the causes of formation for these currents.

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GOVERNMENT OF INDIA

Date: - 3rd April-2019

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

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 1330h on 14/2/92 at Sunday ls.

Q.2) a) What is Tropical Revolving Storm? Ideal conditions for the formation of TRS.
b) Explain well developed TRS structure with diagrams.

Q.3) Write short notes on:
- **a)** Geostrophic Winds
- **b)** Absolute Instability of Air
- **c)** Refraction of Sea Waves
- **d)** Warm & Cold Front

Q.4) Describe the life span of Active region Icebergs. Describe the function of international Ice Patrol.

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

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 Vessels performance curves and their use?

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GOVERNMENT OF INDIA

Date: - 7th Jan-2019

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)

FUNCTION: NAVIGATION (Management Level)

PAPER: METEOROLOGY

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 (#4346) on 9th Feb 1992 at 1200 hrs by Simplified Harmonic Constant Method.

Q.2) a) Explain warning signs of an approaching TRS.
b) Avoiding action for TRS in Northern Hemisphere with diagram.

Q.3) a) Write suitable sketch, describe the formation of frontal depression.
b) Explain:

i) Frontogenesis
ii) Frontolysis
iii) Occlusion

Q.4) a) Explain with block diagram the various stages in the development of sea ice.
b) Describe the movement and decay of icebergs in the North Atlantic Ocean.

Q.5) Write short notes on any three of the following:

a) Significant wave light
b) Anticyclone
c) Eckman spiral
d) Cold front

Q.6) a) List various weather routing services available to shipping.
b) Construct a ship's performance curve and how it is used in weather routing.

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GOVERNMENT OF INDIA

Date: - 4th Oct-2018

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)

FUNCTION: NAVIGATION (Management Level)

PAPER: METEOROLOGY

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 1000 hrs for at Capetown (ATT Vol.2 # 3782) on 12th Jan 1992 at 0600 hrs L.T.

Q.2) a) List the areas where tropical storms frequently occur and their approximate yearly frequency together with local names. Which are the regions in the world free of tropical storms and why?
b) Explain your actions in avoiding a TRS in Northern Hemisphere when it is near the point of re-curvature with the help of safety sector method.

Q.3) a) Make plan and cross sectional sketches of a typical frontal depression in the Southern hemisphere, showing the probable path, fronts, isobars with pressures, wind directions & forces and clouds.
b) Describe in detail the probable sequence of weather that would be experienced during the passage of the warm front by an observer to the north of this depression.

Q.4) a) How does ice accretion occur on board a ship?
b) What is an International Ice Patrol (IIP)? What all details are promulgated in the ice report?

Q.5) In respect of prevailing weather explain ship performance curves? What is an air mass? Give the nomenclature of air masses? How are these modified?

Q.6) Write short notes on any three from the following:
i. Sketch and explain atmospheric pressure distribution of the globe?
ii. Gradient wind.
iii. Ridge and trough isobaric pattern
iv. What all aspects will you consider for ventilating a cargo hold carrying dry hygroscopic cargo while proceeding from area of low temperature to areas of high temperatures?

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GOVERNMENT OF INDIA

Date: - 9th July-2018

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)

FUNCTION: NAVIGATION (Management Level)

PAPER: METEOROLOGY

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 Sultanpur (No. 4344 ATT-2) at 0800 hrs LT on 19th April 1992?

Q.2) a) Explain the factors associated with decay of TRS?

b) While heading N.E. in the North Atlantic (Latitude 10^{O} N) at 10 knots, you receive information that a tropical storms in the vicinity is travelling at 15 knots, wind variable moderate SW'ly swell. What action would you take?

Q.3) Write short notes on following:

a) Sea surface temperature in South Atlantic.

b) Occluded front and its significance to the mariner.

Q.4) Explain the occurrence of warm anticyclones. State the season and locations in which they usually exist and describe the weather associated with them.

Q.5) a) What are the primary causes of ocean surface currents?

b) Explain up-welling current with two examples

Q.6) a) Describe the optimum routeing. How would you achieve the objectives of weather routeing in optimum routeing?

b) What is the different weather information available from the charts received by a facsimile receiver?

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GOVERNMENT OF INDIA

Date: - 6th April-2018

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)

FUNCTION: NAVIGATION (Management Level)
PAPER: METEOROLOGY

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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) Calculate the height of tide at 1400 hrs LT on 5th Jan 1992 at port of Deal (#98).

Q.2) a) State the conditions favourable for the formation of a Tropical Revolving Storm.
b) Explain with a suitable sketch the movement of a tropical revolving storm in the Northern Hemisphere.

Q.3) a) Make plan and cross sectional sketches of a typical frontal depression in the Northern hemisphere, showing the probable path, fronts, isobars with pressures, wind directions & forces and clouds.
b) Describe in detail the probable sequence of weather that would be experienced during the passage of the cold front by an observer to the south of this depression.

Q.4) a) Explain stability of the atmosphere.
b) Write short note on International Ice Patrol.

Q.5) Define adiabatic changes & environmental lapse rate. Describe how lapse rate and condensation level determine the formation of different types of clouds.

Q.6) a) Explain the sequence of weather when a cold front passes over an observer in the Northern Hemisphere.
b) Explain the information contained on a Surface Analysis Chart.

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

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Jaisingh 05/01

TIME: 2 HOURS **PASS MARKS: 50** **MAX MARKS: 100**

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 time and heights of high and low waters at Boom (# 1539c ATT -2) on 24th February 1992. From the above data, find height of tide at 1800 hours local time

Q.2 (a) What are the necessary conditions for formations of TRS?
(b) Draw a cross section of TRS showing areas of cloud and precipitations

Q.3 a) Explain why ITCZ cannot be termed as an Equatorial front or an Inter-tropical front
(b) Frontal depressions are encountered in a row, justify with suitable sketches

Q.4 (a) Describe life span of arctic region icebergs
(b) Describe functions of International Ice patrol

Q.5 a) What are current circulation in Bay of Bengal during S.W monsoon & N.E monsoon?
b) Describe the current data present in current atlases and routeing charts

Q.6 (a) Explain vessels performance curves and their uses
(b) Explain various types of facsimile charts and how these are used for weather roueting purposes?

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

TIME: 2 HOURS **PASS MARKS: 50** **MAX MARKS: 100**

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)

5/10/17

Q.1 Find the height of tide at Vlissingen (Flushing) (# 1534) at 0430 hrs on 2nd January 1992 using Simplified Harmonic constant method

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.

Q.3 a) Why is it that in some ocean there are Trade winds and in others in the same Latitudes there are Monsoons
b) Describe the sequence of clouds & weather at Cold & Warm front

Q.4 a) Discuss with the aid of suitable sketches the normal season and probable tracks of North Atlantic Icebergs from origin to decay
b) Describe the factors which may give rise to ice accretion?

Q.5 a) Discuss with the aid of suitable sketches the normal season and probable tracks of North Atlantic Icebergs from origin to decay
b) Describe the factors which may give rise to ice accretion?

Q.6 Define synoptic and prognostic charts. Explain how you would use these charts for
i) Determination of surface winds
ii) Forecasting the movements of fronts
iii) Forecasting of sea fog

5 What are the different types of drift and Storm Current example of each

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Name of Prevailing current in South Pacific ocean.

$f_4 = 0$
$F_4 = 0.014$
$f_6 = 0.28$
$F_6 = 0.016$

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

53B

10/2/18

TIME: 2 HOURS **PASS MARKS: 50** **MAX MARKS: 100**

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 (India) on 22nd March 1992 at 1830 hrs IST

Q.2 a) List the areas where tropical storms frequently occur, together with the local names for the storms. Why is the tropical region of South Atlantic Ocean free from tropic storms?
b) Briefly explain the use of 'safety sectors' for keeping a ship clear from the path of a tropical storm

Q.3 a) Discuss the effects of temperature changes over land and sea?
b) Describe the weather associate with the passage of a Warm front and Occluded front?

Q.4 a) What is meant by 'pressure gradient'? Describe 'wind rose'
b) Write short notes on 'Pack ice' and 'Fast ice'?

Q.5 What are the differences between a drift and stream current? Mention a good example of each. Name the prominent currents of the South Pacific Ocean?

Q.6 a) Describe the synoptic charts. What information can a mariner obtain from it? How would you find the pressure gradient from it?
b) Write short notes on weather routeing services available to shipping?

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GOVERNMENT OF INDIA

Date: - 7th April-2017

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)

FUNCTION: NAVIGATION (Management Level)

PAPER: METEOROLOGY

TIME: 3 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 Simple Harmonic Method (Shorter Method).

Q.2 With respect to Tropical Revolving Storm describes the following:-

a) Condition necessary for the formation of a TRS.
b) Warning signs of an approaching TRS.
c) Avoiding action to be taken if you are in the vicinity of a TRS.

Q.3 What are Frontogenesis and Frontolysis?
Illustrate with sketch the life cycle of a frontal Depression.

Q.4 (a) Describe various methods/ sources of information inputs for making of analytical weather for synoptic hour.
(b) Describe conditions that may give rise to instability of atmosphere.

Q.5 Describe the Ice bergs of Arctic region and usual path they take. Explain signs of approaching Ice bergs and actions will you take on seeing these signs.

Q.6 State the objectives of weather routeing. Explain how you will carry out weather roueting onboard your vessel.

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5/B

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

TIME: 2 HOURS **PASS MARKS: 50** **MAX MARKS: 100**

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 Cape Town (# 3782 ATT -2) at 1430 hrs on 19th March 1992 using Simplified Harmonic constant method.

Q.2 a) What are the warning signs of an approaching TRS and the weather associated with it.
b) With a diagram explain what avoiding action to take if your ship is in Northern hemisphere

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 situated over North America moves towards the Atlantic Ocean in summer and winter

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

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

Q.6 (a) Define significant wave height and fetch
(b) Explain the method of shipboard weather roueting with suitable diagrams

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GOVERNMENT OF INDIA

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)

FUNCTION: NAVIGATION (Management Level)

PAPER: METEOROLOGY

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 By using SHM, find the height of Tide at Woods hole (#2790) on 10th March 1992 at 1730 hrs. LT.

Q.2 Your ship is bound from Norway to Miami (Florida) in the month of October. You are receiving storm warnings giving you the position of the eye of TRS every 6 hourly. How would you avoid the influence of TRS by the use of " Safety Sector method"?

Q.3 a) What are the causes of Global warming?
b) Define anticyclone & Ridge

Q.4 a) Define an iceberg. Describe the icebergs of Arctic and Antarctic.
b) Explain the movement and decay of ice bergs.

Q.5 a) Explain drift & upwelling current.
b) Explain the method of estimating waveheight & waveperiod.

Q.6 a) List various weather routing services available to shipping.
b) Construct a ship's performance curve and how it is used in weather routing?

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GOVERNMENT OF INDIA

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)

FUNCTION: NAVIGATION (Management Level)

PAPER: METEOROLOGY

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 heights and times of high and low waters at Hamburg # 1444 on January 28, 1992; then calculate the height of tide at 0700 zone time at Hamburg. ANS→ 2.0m

Q.2 a) State the favourable conditions for the formation of TRS.
b) Show with the help of suitable sketches the typical path of a TRS in the northern and southern hemispheres.

Q.3 a) Describe the characteristics and weather associated with following types of clouds:
i) Altocumulus
ii)Nimbostratus
iii)Cumulonimbus

b) Explain the weather associated with cold front.

Q.4 a) Explain the contents of coastal weather bulletin issued by Indian meteorological department.
b) i. Explain gradient current.
ii Describe how the weather is affected by various ocean currents?

Q.5 a) Explain the formation of sea ice.
b) Describe the factors, which may give rise to ice accretion.

Q.6 How is weather forecasting carried out? Show by an example how you would make a short time weather forecast. Use a simple weather map of a frontal depression locating your vessel in the warm sector in the northern hemisphere.

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GOVERNMENT OF INDIA

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)

FUNCTION: NAVIGATION (Management Level)

PAPER: METEOROLOGY

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 0830 hrs on 20th January 1992, at Dover.

Q. 2 a) Explain the structure of a tropical revolving storm with a neat sketch. Describe the weather conditions associated with the 'eye' and eye wall'.
b) Describe the practical rules for avoiding the eye of such a storm in the Northern hemisphere with appropriate sketches.

Q. 3 Write short notes on any four:
a) Geostrophic wind
b) Refraction of sea waves
c) Diurnal Variation of Relative Humidity
d) Absolute instability of air
e) Warm front.

Q. 4 a) Describe the signs which may indicate proximity of ice on clear days and nights.
b) Explain the phenomenon of freezing spray and actions to be taken to minimize its effects.

Q. 5 a) Describe the surface water circulation in the North Atlantic Ocean.
b) Why the surface currents attain higher rates in Western side of oceans as compared to Eastern side of Ocean.

Q. 6 a) Describe the procedures for Climatological Routeing.
b) Explain the purpose of Maritime Forecast Code and the data given by MARFOR.

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GOVERNMENT OF INDIA

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)

FUNCTION: NAVIGATION (Management Level)

PAPER: METEOROLOGY

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 Cape Town (ATT II- 3782) at 1830 hrs LT on 06th March 1992?

Q. 2 a) State Buy's Ballot Law? Describe the warning signs of the presence of an approaching TRS?

b) Explain the evasive actions to be taken by own vessel in the dangerous quadrant of a TRS in Northern Hemisphere.

Q. 3 Explain in detail weather sequence on board a vessel in Southern Hemisphere as it passes north of a SE moving frontal depression.

a) On passing the warm front.

b) Within warm air mass.

c) On passing the cold front.

Illustrate your answer with a neat sketch.

Q. 4 Write short notes on any three.

a) Predominant current.

b) Gradient wind.

c) Isallobars.

d) Fast Ice.

Q. 5 With suitable diagrams

a) Describe the local winds for the Mediterranean Sea

b) Explain Up welling and down welling currents.

Q. 6 State the objectives of weather Routeing. Explain how you will carry out weather Routeing on board your vessel to get optimum performance.

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GOVERNMENT OF INDIA

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)

FUNCTION: NAVIGATION (Management Level)

PAPER: METEOROLOGY

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 Calculate by Simple harmonic constant method, the height of tide at Good's island (ATT 3) on 20th January 1992 at 1300 hrs LT.

Q. 2 a) Describe the warning signs which could indicate the approach of a Tropical Revolving Storm.

b) In January in the South Indian Ocean in latitude 08° S longitude 080° E, while heading 230°, on passage from Singapore to Durban, South Africa the following weather observations were noted in the ship's deck log book:

Time	Atmospheric pressure	Wind direction	Wind force	state of sea/ swell
1600 hrs	1012.4 mb	N'ly	1/2	calm sea
2000 hrs	1010.8 mb	NW'ly	3	slight SW swell
2400 hrs	1008.2 mb	NW'ly	6/7	moderate SW swell

i) Based on these observations what would be your assessment of the situation at 2400 hours?

ii) State, giving reasons, the action you would take.

Q. 3 a) What are the causes of sea fog? State the localities in which it is most frequent.

b) Describe the weather pattern expected on board a vessel when a cold front passes 100 miles north of your vessel?

Q. 4 Discuss with the aid of suitable sketches the normal season and probable tracks of North Atlantic Ice Bergs from Origin to Decay.

Q. 5 What are the differences between a drift and a stream current? Mention a good example of each. Name the prominent currents of the South Pacific Ocean?

Q. 6 a) Describe the synoptic chart. What information can a mariner obtain from it? How would you find the pressure gradient from it?

b) Write short notes on weather routeing services available to shipping?

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44 B

GOVERNMENT OF INDIA

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)

FUNCTION: NAVIGATION (Management Level)

PAPER: METEOROLOGY

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 07th Feb 92, so that a ship of maximum draft 7m can sail out keeping an under keel clearance of one meter, while passing over shoal (depth marked 6m on chart) near entrance to Setubal (No. 1744, ATT–1)?

Q. 2 a) What are the warning signs of an approaching TRS?

b) Explain with the help of suitable sketches the most probable path of a cyclone in the North & South hemispheres. Also describe the avoiding action to be taken, if the vessel is in the dangerous quadrant in the Northern hemisphere.

Q. 3 a) Discuss the effects of temperature changes over land and sea?

b) Describe the weather associate with the passage of a Warm front and Occluded front?

Q. 4 a) What is meant by 'pressure gradient'? Describe 'wind rose'.

b) Write short notes on 'Pack ice' and 'Fast ice'?

Q. 5 a) Describe the surface current circulation in the South Atlantic Ocean along with the causes of formation for those currents.

b) Describe the forms of display which are commonly used to depict ocean current.

Q. 6 a) Describe significant wave height and the factors, which influence it.

b) Describe the use of various data presented in sailing directions, mariner's handbook and ocean passages for the world in weather/ climatological routeing?

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GOVERNMENT OF INDIA

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)

FUNCTION: NAVIGATION (Management Level)

PAPER: METEOROLOGY

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 Sultanpur (No.4344 ATT-2) at 0800 hrs LT on 19th April 1992?

Q. 2 Sketch and describe plan of TRS showing isobars, wind circulation, track path, eye, dangerous semicircle and navigable semicircle for both hemisphere.

Q. 3 a)With suitable sketches describe the formation of a frontal depression
b) Explain:- i) Frontogenesis ii) Frontolysis iii) Occlusion.

Q. 4 Write short notes on
a) Methods of reducing ice accretion
b) International Ice Patrol
c) Information given in ice charts

Q. 5 Explain, giving examples: Drift, Upwelling currents, Gradient Currents, warm currents and cold currents of the oceans.

Q. 6 Write short notes with suitable sketches on:
a) Synoptic charts
b) Prognosis charts
c) Wave charts.

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GOVERNMENT OF INDIA

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)

FUNCTION: NAVIGATION (Management Level)

PAPER: METEOROLOGY

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 1030 hrs on 17th January 1992 at VLISSINGEN (FLUSHING). ATT-I

Q. 2 a) What are the necessary conditions for the formation of a Tropical Revolving Storm?

b) If you were receiving weather reports giving position of centre of TRS with its movement, how will you keep your vessel safe?

Q. 3 Write short notes on:

a) Geostrophic Wind

b) Gradient Wind

c) Families of Depression

d) Frontolysis

Q. 4 a) What is significant wave height and what are the factors which influence it.

b) Describe accretion of Ice and what precautions are rquired to be taken to avoid ice accretion on board.

Q. 5 a) Distinguish between Pack Ice and Fast Ice?

b) With the aid of a suitable sketch describe current ciculation in North Atlantic Ocean. Mark warm and cold water currents wthin the sketch. What type of fog is expected within this region and why? 10

Q. 6 Describe various types of weather facsimile charts/wather 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? 12

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GOVERNMENT OF INDIA

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)

FUNCTION: NAVIGATION (Management Level)

PAPER: METEOROLOGY

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 Singapore (Keppel Harbour) at 0930hrs LT on 26th April 1992?

Q. 2 a) State the factors that affect the movement of TRS.
b) Draw a cross section of a TRS showing areas of cloud & precipitation.

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

Q. 4 Describe the life span of the arctic region icebergs. Describe the functions of International Ice Patrol?

Q. 5 Write short notes on the following:
a) Isallobars b) Vector Mean current
c) Global warming d) Corona

Q. 6 Describe Optimum routing and explain the methods used on board ship for weather Routeing.

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GOVERNMENT OF INDIA

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)

FUNCTION: NAVIGATION (Management Level)

PAPER: METEOROLOGY

TIME: 2 Hours **PASS MARKS: 50** **MAX. MARKS: 100**

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 Calculate height of tide by harmonic constant method for the port of Mumbai, Apollo Bandar at 0630 hrs GMT on 15th January 1992. (Use shorter method)

Q. 2 a) Describe the structure of cyclone in Arabian Sea.
b) Why does a TRS recurve and what is the importance of cyclostrophic wind in TRS?

Q. 3 a) What are adiabatic and isothermal changes and it's significance to weather.
b) Describe the process of development of SW monsoon in Indian subcontinent.

Q. 4 a) Write in brief i) MAFOR code ii) Significant wave height
iii) Wave chart
b) Explain the significance of current-rose-chart.

Q. 5 a) List down various names of ocean currents on different ocean areas.
b) Draw a sketch to show movement of current in BLACK-SEA & MEDITERRANEAN SEA, with the reason associated to it's flow.

Q. 6 a) Write down different types of icebergs found at sea.
b) Explain the role and responsibility of International-Ice-Patrol.

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GOVERNMENT OF INDIA

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PAPER: METEOROLOGY

TIME: 2 Hours PASS MARKS: 50 MAX. MARKS: 100

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 earliest time on 10th Feb 1992, AM, when a ship drawing 7m can pass over a 6m shoal with an under-keel clearance of 1 m at Setubal (No. 1744, ATT-I)

Q. 2 a) State the typical warning signs of an approaching TRS and describe the messages require to be sent as per SOLAS.
b) Explain the actions to be taken to avoid the storm centre and its vicinity in Southern Hemisphere.

Q. 3 a) Describe the characteristics of a region acting as the source region for an Air mass.
b) Describe how lapse rate & condensation level determine the formation of clouds & Cloud types.

Q. 4 a) Sketch and describe the structure of typical frontal zone.
b) Explain the precautions to be taken when navigating in or near an area affected by ice.

Q. 5 a) What are the current circulation in Bay of Bengal during S.W. monsoon & N.E Monsoon?
b) Describe the current data present in current atlases and Routeing charts.

Q. 6 a) Define significant wave height and fetch.
b) Explain the method of shipboard weather Routeing with suitable diagrams.

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GOVERNMENT OF INDIA

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)

FUNCTION: NAVIGATION (Management Level)

PAPER: METEOROLOGY

TIME: 2 Hours | PASS MARKS: 50 | MAX. MARKS: 100

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 1000hrs LT on 23rd Jan 1992 ATT (VOL-II).

Q. 2 With respect to Tropical Revolving Storm describe the following:
a) Conditions necessary for the formation of a TRS.
b) Factors affecting movement of a TRS.
c) Avoiding action to be taken if you are in the vicinity of TRS.

Q. 3 a) Describe the effects of accumulation of greenhouse gas in the atmosphere.
b) Sketch and describe the isobars and wind circulation in a frontal depression.

Q. 4 Discuss with the aid of suitable sketches the normal season and probable tracks of North Atlantic icebergs from origin to decay.

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.

Q. 6 Define synoptic and prognostic charts. Explain how you would use these charts for:
I) Determination of surface winds
II) Forecasting the movements of fronts
III) Forecasting of sea fog

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GOVERNMENT OF INDIA

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TIME: 2 Hours | PASS MARKS: 50 | MAX. MARKS: 100

Notes:

1. Question No.1 is compulsory.
2. Attempt any FOUR questions from the remaining 5 Questions.
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4. Use Admiralty Tide Tables 1992 Edition (ATT 1992).

Q. 1 Calculate height of tide for the port of MASQAT at 0600 hrs LT on 10th APRIL 1992 (ATT).

Q. 2 a) Your vessel is sailing from a port in NORWAY to LIVEPROL. At sea you observe a steady fall in pressure and 'N' wind speed of Beaufort scale 6, Swell W'LY with drizzle and overcast. What actions are you going to take for safe passage?

b) What are the reasons for fewer occurrences of TRS in South Atlantic Ocean?

Q. 3 a) Explain the importance of humidity, temperature and wind shear on atmospheric equilibrium.

b) Define 'COL', 'STRAIGHT ISOBARS' and TROUGH'.

Q. 4 a) Write down the obligation of Ship-Master for reporting dangerous-ice.

b) Describe the hazards associated with ice-accretion and accumulation and means to minimize the same.

Q. 5 Describe various factors for development of ocean-currents. What are the reasons for western boundaries of ocean having higher level than the eastern ones? Explain.

Q. 6 a) Write down the information's given in a weather-Routeing chart.

b) Describe briefly the importance of weather-Routeing.

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GOVERNMENT OF INDIA

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)

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PAPER: METEOROLOGY

TIME: 2 Hours **PASS MARKS:** 50 **MAX. MARKS:** 100

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 times and heights of high and low waters at Boom (# 1539c) on 24th February 1992. From the above data, find the height of tide at 1800 hours Local time.

Q. 2 a) Describe with a neat sketch typical path of a T.R.S. in southern hemisphere. Why does a TRS not always follow such a track?

b) State the regulation given in SOLAS regarding reporting a TRS & list the information which must be included in such a report.

Q. 3 a) Explain why ITCZ cannot be termed as an Equatorial front or an Inter-tropical front.

b) "Frontal Depressions are encountered in a row". Justify your answer with the help of suitable sketches.

Q. 4 a) Explain the three mechanisms of ice accretion on board a ship.

b) How do icebergs of the northern hemisphere form and decay?

Q. 5 a) What are the primary causes of ocean surface currents?

b) Explain up-welling current with two examples.

Q. 6 a) Describe the optimum routeing. How would you achieve the objectives of weather routeing in optimum routeing?

b) What is the different weather information available from the charts received by a facsimile receiver?

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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).

Q. 1 Find out the earliest time on AM 07th Feb 92, so that a ship of maximum draft 7m can sail out keeping an under keel clearance of one meter, while passing over shoal (depth marked 6m on chart) near entrance to Setubal (No. 1744, ATT–1)?

Q. 2 a) What are the warning signs of an approaching TRS?

b) Explain with the help of suitable sketches the most probable path of a cyclone in the North & South hemispheres. Also describe the avoiding action to be taken, if the vessel is in the dangerous quadrant in the Northern hemisphere.

Q. 3 a) Why is it that in some ocean there are Trade winds and in others in the same latitudes there are monsoons?

b) Sketch and describe the structure of Warm front and Cold front?

Q. 4 a) Describe the conditions and values of lapse rates which lead to stability/instability of atmosphere.

b) Describe the factors which may give rise to Ice accretion?

Q. 5 a) Briefly explain the method of estimating wave heights and wave periods?

b) A surface current flows in one direction and an undercurrent flows in the opposite direction through the Straits of Gibraltar. Explain this fully.

Q. 6 a) Describe Synoptic and Prognostic charts along with their use.

b) Explain the purpose of Maritime Forecast (MARFOR) code?

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Notes:

1. Question No.1 is compulsory.
2. Attempt any FOUR questions from the remaining 5 Questions.
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4. Use Admiralty Tide Tables 1992 Edition (ATT 1992).

Q.1 A vessel is scheduled to pass under high tension cables in OOSTENDE (ATT 1.No. 1564) at 1230 hrs on 20th Feb 1992. The charted depth under the cables is 6.20m and their height above MHWS is shown as 20.40 m. The vessel's draft is expected to be 8.5m even keel and the highest point of the ship is 28.5m above the keel. Determine her UKC and overhead clearance.

Q.2 a) Explain the conditions associated with formation of TRS and factors affecting movement of TRS?

b) You are bound from Amsterdam to the West Indies and you receive weather bulletin and visual warning of a hurricane moving N.E., and that its centre will pass over or near your position. State what action you would take, giving your reasons.

Q.3 a) Describe the characteristics and weather associated with various types of clouds?

b) Briefly describe the causes and effects of Global warming?

Q.4 a) Write short notes on Diurnal variation of temperature and atmospheric pressure?

b) Describe the factors which may give rise to ice accretion and methods of reducing ice accretion.

Q.5 What are the differences between a drift and a stream current? Mention a good example of each. Name the prominent currents of the South Pacific Ocean?

Q.6 a) Describe the synoptic chart. What information can a mariner obtain from it? How would you find the pressure gradient from it?

b) Write short notes on weather routeing services available to shipping?

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GOVERNMENT OF INDIA

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)

FUNCTION: NAVIGATION (Management Level)

PAPER: METEOROLOGY

TIME: 2 Hours | PASS MARKS: 50 | MAX. MARKS: 100

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 Sultanpur (No. 4344 ATT-2) at 0800 hrs LT on 19th April 1992?

Q. 2 a) Explain the factors associated with decay of TRS?

b) While heading N.E. in the North Atlantic (Latitude 10^0 N) at 10 knots, you receive information that a tropical storm in the vicinity is travelling at 15 knots, wind variable, moderate SW'ly swell. What action would you take?

Q. 3 a) Discuss the effects of temperature changes over land and sea?

b) Describe the weather associate with the passage of a Warm front and Occluded front?

Q. 4 a) What is meant by 'pressure gradient'? Describe 'wind rose'.

b) Write short notes on 'Pack Ice' and 'Fast Ice'?

Q. 5 a) Briefly explain 'gradient current' and 'up-welling current'?

b) Give a brief description of the currents in the Arabian Sea for January and July. Explain the reasons for the difference during these months?

Q. 6 a) Describe the weather routeing services available to shipping?

b) List out various information given in weather fax charts and wave charts?

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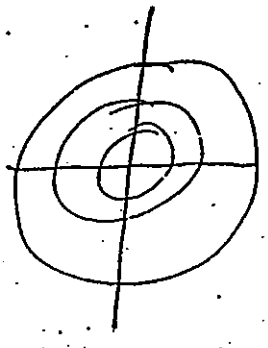

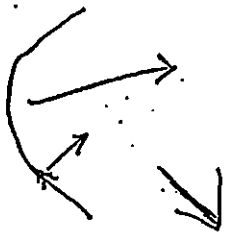

GOVERNMENT OF INDIA

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)

FUNCTION: NAVIGATION (Management Level)

PAPER: METEOROLOGY

TIME: 2 Hours | PASS MARKS: 50 | MAX. MARKS: 100

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 Lagos (No.1749 ATT-1) at 0500 hrs GMT on 21st Feb 1992? Find the time at which the morning tide falls to 2.0m on 21st Feb 1992?

Q. 2 a) Give the names of Tropical Revolving Storms (TRS) in different parts of the world?

b) Describe the following with respect to TRS:

i) Conditions favourable for its formation
ii) Structure
iii) Movement

Q. 3 a) Describe in detail Frontogenesis with suitable sketches?

b) Explain how advection and radiation fogs are formed. Which one does not form over the sea and why?

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?

Q. 5 a) Describe the surface current circulation in the South Atlantic Ocean along with the causes of formation for those currents.

b) Describe the forms of display which are commonly used to depict ocean current.

Q. 6 a) Describe significant wave height and the factors, which influence it.

b) Describe the use of various data presented in sailing directions, mariner's handbook and ocean passages for the world in weather / climatological routeing?

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GOVERNMENT OF INDIA

12th July 2012 (AM)

(10)

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)

FUNCTION: NAVIGATION (Management Level)

PAPER: METEOROLOGY

TIME: 2 Hours | PASS MARKS: 50 | MAX. MARKS: 100

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 1830 hours on 21st March 1992 at Dover (No. 89 ATT - I)?

Q. 2 a) What is Buys Ballot's law? Discuss the circumstances under which the law cannot be applied?

b) While on a vessel bound from Fremantle to Mumbai, south of equator, you experience a strong N.E' ly wind increasing in force, a steadily falling barometer, with a threatening appearance of the weather. What action would you take, and why?

Q. 3 a) What are the causes of sea fog? State the localities in which it is most frequent.

b) Describe the weather pattern expected on board a vessel when a cold front passes 100 miles north of your vessel?

Q. 4 Discuss with the aid of suitable sketches the normal season and probable tracks of North Atlantic Ice Bergs from Origin to Decay.

Q. 5 Describe the probable winds and currents you would expect on a passage from Liverpool to Cape Town.

Q. 6 a) What information's are available in the monthly weather routeing charts?

b) Differentiate between "Weather routeing" and "Climatological routeing"?

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Q. 8 a) Describe the stability criteria for a ship carrying grain in bulk for ships without Document of Authorisation?

b) Describe "Bundling" method of securing bulk grain cargoes in filled and trimmed compartment.

Q. 9 Explain the following briefly:

i) Torsional stress ii) Stack height iii) Tare Weight

iv) Transversal lashing system v) Cellular container vessel

Q. 10 Describe various precautions you will take as Chief Mate before and during loading of a boilers weighing 200 tonnes. Draw a neat sketch showing securing arrangement for this cargo.

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