

**C-4476**

**Sub. Code**

**98818**

**DIPLOMA EXAMINATION**

**NAUTICAL SCIENCE**

**APRIL 2021 EXAMINATION**

**&**

**APRIL 2020 ARREAR EXAMINATION**

**First Semester**

**ENGLISH, HUMAN FACTORS MARITIME HISTORY**

**(2020 onwards)**

Duration : 3 Hours

Maximum : 75 Marks

**Part A**

(10 × 2 = 20)

Answer **all** questions.

1. What is communication skill?
2. Define physical fitness.
3. What is an on-board human relation?
4. Define resource management.
5. Explain organizational structure.
6. What is Human Resource Development?
7. Write any three responsibilities of the seafarer.

8. Explain time management.
9. What is team bonding?
10. What is a sexually transmitted disease?

**Part B**

(5 × 5 = 25)

Answer the following questions.

11. (a) What are the importance of maritime articles? Give an example.

Or

- (b) Describe the nature of the job at sea.

12. (a) Explain the importance of interpersonal relationship.

Or

- (b) Explain the importance of team work, team spirit.

13. (a) Explain the necessity of positive attitudes, work ethics.

Or

- (b) Describe Shipboard organizational structure.

14. (a) What are the benefits to seafarers under the rule?

Or

- (b) What is the Art of Listening? And write about the abuse of drugs and Alcohol.

15. (a) Write in detail about the India's ancient maritime history.

Or

- (b) Write in detail about the steps involved in travel safety.

**Part C** (3 × 10 = 30)

Answer the following questions.

16. (a) Write an essay about the introduction of Standard Marine Communication Phrases.

Or

- (b) List out the Personal traits that will assist in effective functioning onboard.

17. (a) What is Leadership allocation and prioritization of resources.

Or

- (b) Describe functions and responsibilities of shipboard staff.

18. (a) How to access information regarding registered recruitment and placement agencies?

Or

- (b) What is Post Independence growth of Indian Shipping?

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98821

**DIPLOMA EXAMINATION**  
**NAUTICAL SCIENCE**  
**APRIL 2021 EXAMINATION**

**&**

**APRIL 2020 ARREAR EXAMINATION**

**Second Semester**

**NAVIGATION III: TERRESTRIAL, COASTAL AND CELESTIAL NAVIGATION**

**(2020 onwards)**

Time: 3 Hours

Maximum: 75 Marks

**PART A**

(10 x 2 = 20)

Answer all questions

1. At what angle earth's axis is inclined to the plane of the orbit?
2. How will you keep the time at sea?
3. Define 'Elevated pole'.
4. What is International Date Line?
5. What is the effect of 'Leeway on ship's course'?
6. Name celestial poles.
7. Define 'Effective speed'.
8. Express natural scale of charts.
9. Define 'Neap tide'.
10. How will you express the speed of ship?

**PART B**

(5 x 5 = 25)

Answer all questions, choosing either a (or) b

11. (a) Explain the concept of the earth's axial rotation causing change in the hour angle of bodies.

(or)

- (b) Explain "Latitude and longitude with neat diagram.

12. (a) Define 'Greenwich Hour Angle (GHA)' and 'Local Hour Angle (LHA)'.  
(or)

(b) Distinguish between 'vertical circle' and 'prime vertical circle'.

13. (a) Describe salient features of 'Great Circle'

(or)

(b) Describe the relationship between the altitude of Polaris and the observer's latitude.

14. (a) Describe the uses of Ocean Passages of the world.

(or)

(b) List Nautical Publications carried onboard.

15. (a) Explain how will you measure the Vertical and Horizontal angles of horizon on board ship.

(or)

(b) State the danger of placing implicit reliance upon floating navigational aids.

### **PART – C**

(3 x 10 = 30)

Answer all questions, choosing either a (or) b

16. (a) Describe the information contained in general in the Nautical Almanac (NA) and in detail in the daily pages.

(or)

(b) Explain the relationship between azimuth and quadrantal bearings.

17. (a) Describe the significance of intercepts and long by Chron methods of sights.

(or)

(b) Explain the principles and rules of the Maritime Buoyage System.

18. (a) Explain the use of Admiralty and other distance tables.

(or)

(b) Discuss in detail the Voyage planning and execution process.

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**DIPLOMA EXAMINATION**

**NAUTICAL SCIENCE**

**APRIL 2021 EXAMINATION**

**&**

**APRIL 2020 ARREAR EXAMINATION**

**Second Semester**

**NAVIGATION - IV: ADVANCED BRIDGE EQUIPMENT, WATCH-KEEPING  
AND METEOROLOGY**

**(2020 onwards)**

Time: 3 Hours

Maximum: 75 Marks

**PART - A**

(10 x 2 = 20)

Answer all questions

1. What is Auto-pilot?
2. Describe the purpose of 'Off-Course' alarm
3. State the duties of "Lookout man"
4. Who is "Helmsman"?
5. State the circumstances under which the Master should be called for bridge?
6. Describe gulf stream current.
7. What are the causes of storm?
8. How will you measure the wind force?
9. Name the factors which affects visibility.
10. Define "dew"

**PART - B**

(5 x 5 = 25)

Answer all questions, choosing either a (or) b

11. (a) Describe procedure for change-over from Hand steering to Auto-Pilot  
(or)  
(b) Describe a "Bridge Navigation and Watch Alarm System"(BNWAS)  
and its use.

12. (a) Explain ECDIS uses and its limitations.

(or)

(b) Describe the organizational structure of the bridge team

13. (a) Explain the watch keeping duties at anchor and at sea.

(or)

(b) Explain the preparations involved and duties prior to arrival port from the Deck officers perspective.

14. (a) Describe the uses of Ocean Passages of the world.

(or)

(b) List Nautical Publications carried on board.

15. (a) Describe Weather Reporting Procedures.

(or)

(b) Explain precipitation, drizzle, hail, snow, and sleet.

**PART – C**

(3 x 10 = 30)

Answer all questions, choosing either a (or) b

16. (a) Explain Speed Log principle and operations of Doppler, electromagnetic logs.

(or)

(b) Describe various 'controls' fitted on 'steering console' and their purposes

17. (a) Specify the records entered at Bridge in various log books.

(or)

(b) Explain the duties and procedures associated with preparing the vessels to proceed to sea.

18. (a) Explain the potential collision situations in detail.

(or)

(b) Explain pressure Gradient and basic diagram of the seven Isobaric Systems.

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**DIPLOMA EXAMINATION  
NAUTICAL SCIENCE  
APRIL 2021 EXAMINATION**

**&**

**APRIL 2020 ARREAR EXAMINATION**

**Second Semester**

**CARGO HANDLING, STOWAGE AND SEAMANSHIP - II**

**(2020 onwards)**

Time: 3 Hours

Maximum: 75 Marks

**PART-A**

(10 x 2 = 20)

Answer all questions

1. Define ESD System.
2. How will you measure the formation of gases in cargo spaces?
3. What are Refrigerated containers?
4. What is the purpose of 4-legged slings?
5. What is the use of purpose of 'Bulk grabs and pulp drum hooks.
6. Define angle of Repose.
7. To what extent the clean ship is required for Grain carrier ships?
8. State the purpose of Swivel piece.
9. What is Stowage plan?
10. Define Material Safety Data Sheets.

**PART-B**

(5 x 5 = 25)

Answer all questions, choosing either a (or) b

11. (a) State the ship's shore safety check list.  
(or)  
(b) What hazards can be present while carrying oil cargo on Tanker ship?
12. (a) Mention the types of containers with their payload and capacity.  
(or)  
(b) What precautions will you take during and after loading containers?.

13. (a) State the principles of Freight rate.  
(or)  
(b) Describe the preparation of hold prior loading clean / dirty cargoes
14. (a) Describe the parts of a windlass with a neat sketch.  
(or)  
(b) State the Safety precautions while entering into battery room.
15. (a) State the safety precautions to be observed while entering into Enclosed Space.  
(or)  
b) Explain the standard crane signals

**PART – C**

(3 x 10 = 30)

Answer all questions, choosing either a (or) b

16. (a) With an aid of neat diagram explain the Inert Gas System.  
(or)  
(b) Discuss the safety precautions to be observed for ships carrying Liquefied gases.
17. (a) Explain the Dangerous Goods Stowage Plan and Dangerous Goods Document of Compliance.  
(or)  
(b) State the requirements for Ventilation Systems and Fire Precautions to be taken for multipurpose ships.
18. (a) List Safe bunkering practices on board.  
(or)  
(b) Explain the method for securing anchor for sea with neat diagram.
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**DIPLOMA EXAMINATION**  
**NAUTICAL SCIENCE**  
**APRIL 2021 EXAMINATION**  
**&**  
**APRIL 2020 ARREAR EXAMINATION**  
**Second Semester**  
**SHIP CONSTRUCTION & SHIP STABILITY – II**  
**(2020 onwards)**

Time: 3 Hours

Maximum: 75 Marks

**PART- A**

(10 x 2 = 20)

Answer all questions

1. What are Gastight zones?
2. What is meant by 'slamming'?
3. Which parts of the ship is affected by panting stress?
4. Define bilge strum box.
5. Why and where are ballast tanks provided?
6. Describe Centre of Pressure?
7. Where is the position of Centre of Gravity of a hanging mass, relative to the ship?
8. Define Righting lever.
9. What do you understand by the term Trim?
10. What is MCT 1cm?

**PART-B**

(5 x 5 = 25)

Answer all questions, choosing either a (or) b

11. (a) Illustrate and label Camber, Sheer, Draught, Free board and Moulded depth of a ship.

(or)

- (b) Explain Gross Tonnage and Net Tonnage.

12. (a) Distinguish between 'hogging' and by 'sagging'.

(or)

(b) Describe racking stress and its causes

13. (a) Describe the bilge piping system of a cargo ship

(or)

(b) Describe FFA and LSA Plan.

14. (a) Explain Buoyancy and Centre of buoyancy with neat diagrams.

(or)

(b) Distinguish between Stiff and Tender condition of ship.

15. (a) Describe and illustrate standard steel sections used for ship construction.

(or)

(b) Which are the factors to be considered while calculating the quantity of cargo to be loaded?

### **PART – C**

(3 x 10 = 30)

Answer all questions, choosing either a (or) b

16. (a) Draw the profile view of a General Cargo ship and mention any five Principal parts.

(or)

(b) Sketch and label elevation of a double hull tanker.

17. (a) Draw a Sketch of a typical forecastle mooring and anchoring arrangements

(or)

(b) Sketch and describe parts of a balanced type rudder.

18. (a) A vessel of constant triangular cross-section has a depth of 12 m and a breadth at the deck of 15 m. Calculate the draught at which the vessel will become unstable if the centre of gravity is 6.675 m above the keel.

(or)

(b) Explain the concept of Free Surface Effect with neat diagrams.

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**DIPLOMA EXAMINATION**  
**NAUTICAL SCIENCE**  
**APRIL 2021 EXAMINATION**  
**&**  
**APRIL 2020 ARREAR EXAMINATION**  
**Second Semester**  
**MARPOL AND MARINE ENGINEERING KNOWLEDGE**  
**(2020 onwards)**

Time: 3 Hours

Maximum: 75 Marks

**PART - A**

(10 x 2 = 20)

Answer all questions

1. State the validity of IOPP Certificate.
2. Describe COW System for oil tanker.
3. What do you understand by the term IMO 2020?
4. What is the purpose of Annex -V?
5. Expand SOPEP.
6. Define clean ballast.
7. State that sources of emission of harmful gases from ships
8. Explain characteristics and chemical hazards of hydraulic fluid
9. State Bernoulli's Principle.
10. Where do you find reciprocating pumps on board ship? .

**PART - B**

(5 x 5 = 25)

Answer all questions, choosing either a (or) b

11. (a) List the equipment required as per SOPEP manual.

(or)

(b) Describe the permissible limits of SOX and NOX emission.

12. (a) Mention all the Annexes to the MARPOL 73/78 Convention.

(or)

(b) What precaution will you take to avoid oil spillage during bunkering operation?.

13. (a) Specify the treatments to be carried out in freight containers which have  
Been used previously for the carriage of harmful substances.  
(or)  
(b) What are Volatile Organic Compounds? Explain with examples.
14. (a) Explain the working principle of Oily water separators  
(or)  
(b) Enumerate the special areas with respect to MARPOL.
15. (a) List the safety precautions to be used while working with compressed air.  
(or)  
(b) Explain 'Ballast Water Management Plan'

**PART – C**

(3 x 10 = 30)

Answer all questions, choosing either a (or) b

16. (a) With an aid of neat diagram explain the Inert Gas System.  
(or)  
(b) Discuss the safety precautions to be observed for ships carrying Liquefied  
gases.
17. (a) Explain the Dangerous Goods Stowage Plan and Dangerous Goods Document  
of Compliance.  
(or)  
(b) State that provisions under MARPOL Annexure – VI, which deals with  
measures taken for prevention of air pollution from ships.
18. (a) List any five types of Valves and their functions.  
(or)  
(b) (i) Explain the characteristics and chemical hazards of hydraulic fluid.  
(ii) Explain the purpose of pressure control valves and flow control valves.
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**DIPLOMA EXAMINATION  
NAUTICAL SCIENCE  
APRIL 2021 EXAMINATION**

**&**

**APRIL 2020 ARREAR EXAMINATION**

**Second Semester**

**EMERGENCIES, MARITIME COMMUNICATION AND COMMERCIAL  
SHIPPING KNOWLEDGE**

**(2020 onwards)**

Time: 3 Hours

Maximum: 75 Marks

**PART - A**

(10 x 2 = 20)

Answer all questions

1. State the use of Fall preventer device.
2. Describe the penalty for not using or wrongly using an ensign.
3. How will you check the ingress of air in fire flaps?
4. What is muster list?
5. State the purpose of ISM.
6. When do you hoist Courtesy flag?
7. What is Morse code signal?
8. What is Manmade port?
9. Define stevedore.
10. What is MLC?

**PART - B**

(5 x 5 = 25)

Answer all questions, choosing either a (or) b

11. (a) Enumerate the functions of Flag State Inspection.  
(or)  
(b) What is PSC and state their roles.
12. (a) What are the salient features of SOLAS.  
(or)  
(b) Describe the procedures for launching free-fall lifeboats.

13. (a) List down the GMDSS equipment.  
(or)  
(b) What is the minimum mandatory requirement for Navigational watch Keeping officers at operational level?
14. (a) Describe the function of BIMCO.  
(or)  
(b) State the relationship between ship-owner and agent.
15. (a) List the precautions to be observed while lowering lifeboat?  
(or)  
(b) Explain the Articles of Agreement.

**PART – C**

(3 x 10 = 30)

Answer all questions, choosing either a (or) b

16. (a) With an aid of neat diagram explain the fire fighting in machinery spaces of General Cargo ship.  
(or)  
(b) Explain the proper procedure to use a walkie-talkie and VHF set.
17. (a) Explain the types of Shipping trade.  
(or)  
(b) Discuss in detail about Global Maritime Distress & Safety System
18. (a) Discuss in detail about IMO and its role in Maritime sector.  
(or)  
(b) Explain the role of Shipping Master in detail.
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