GOVERNMENT OF INDIA

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

FUNCTION: CARGO HANDLING AND STOWAGE (Management Level)

TIME: 3 HOURS **PASS MARKS: 120** **MAX.MARKS: 200**

NOTES:

1. Question 1, 2 and 3 are compulsory. Attempt any five questions of the remaining seven questions.
2. All questions carry equal marks.

Q.1. Cargo Calculations- Draft Survey/ Making Cargo Plan given hatch dimensions, stowage factor, load density, broken stowage (maximum 4 cargoes)

Q.2. Cargo Calculations- Oil Cargo calculations (including wedge)

Q.3. Damage to cargo spaces, ballast tanks and hatch covers- Inspection and Reporting/ Inspection of Cargo gear/ Cargo documents/ Deck Watch

Q.4. Crude/ Petroleum product

Q.5. Liquid chemicals cargo, Liquefied Gas Cargoes

Q.6 IMDG Cargoes

Q.7 Bulk Cargoes (Ores, Concentrates, Sulphur, Coal, HBI/DRI) including IMSBC Code

Q.8 Grain Regulations/ Calculations on Grain Stability Compliance

Q.9. Containers, Car Carrier, Ro-Ro

Q.10 General Cargo/ Heavy Lift Cargo/ Refrigerated Cargo

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

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

FUNCTION: CONTROLLING THE OPERATION OF THE SHIPS & CARE FOR PERSONS ON BOARD (Management Level)

PAPER: NAVAL ARCHITECTURE PAPER - I

TIME: 3 Hours PASS MARKS: 120 MAX. MARKS: 200

Notes:

1. All questions in Part A are compulsory. and carry 30 marks each
2. Attempt any four out of five from Part B. (Each question carry 20 marks)
3. Wherever applicable, sketches should be drawn to support the answer.

Questions based on

15.1.1 Ship Construction

- Welding: Down hand vertical and overhead welding, butt, lap and fillet welds, chain and intermittent welding, weld faults, tests of welds, electric arc welding, TIG and MIG.
- Bulkheads: Transverse bulkheads and racking stresses, margin line, weather tight, rule regarding penetration of collision bulkhead, testing of bulkheads for tightness.
- Watertight and weather-tight doors: Water tight and weather tight doors, categories of watertight doors, rules regarding water-tight doors.
- Corrosion and its prevention: meaning of corrosion, types of corrosion, galvanic actions, cathodic protection, structure of paints, preparing a surface for painting.
- Surveys, certification & dry-docking: Frequency of classification society surveys, items to examine in dry dock, cleaning preparation and painting of the hull in dry dock. Surveys and certification including Harmonised Ship Surveys and Enhanced Surveys, Condition Assessment Scheme and Condition Assessment Programme.

15.2.1 Ship Stability

- Approximate calculation of areas and volumes: Simpson's rule to calculate areas, volumes and centroids.
- Effects of density: TPC, FWA, DWA calculations
- Calculation of free Surface effect
- Simplified stability data: Stability information supplied in simplified form, use of diagrams of dead weight moment.
- Trim and list: LCG, LCB and relationship with trim, trimming moment, loading a given mass to produce a required trim, loading a mass to keep the aft draught constant, correction of draughts, forward aft and mid-ship.
- Dynamical stability: Definition of dynamical stability and calculation of same.
- Intact stability requirements for carriage of the grain
- Dry-docking and grounding: Virtual loss of GM due to dry docking and grounding, calculation of residual GM and draft.

PART A

Q. 1 Ship Stability- Numerical *(Application of Simpson's Rules, Grain Stability)*

Q.2 Ship Stability- Numerical *(Trim, Dry-docking, Grounding with fixed data)*

Q.3 Ship Stability- Numerical based on Ship Stability Booklet *(List, Trim, Dry-docking, Grounding, Intact stability requirements)*

Q.4 Ship Construction- Sketch

(Construction of W/T bulkheads and its attachments to sides and tank top, How water tightness is maintained when bulkheads are pierced by longitudinal, beams or pipes, Arrangement of power operated sliding W/T door, Hinged W/T door and means of securing them, Ramp doors of Ro-Ro ships, Ship side doors)

PART B

Q.5 and Q.6 Ship Stability/ Ship Construction- Theory

(Ship Stability: Effect of density on trim, Effect of beam, freeboard and length on GZ curves, Effect of shift of weight on GZ curves, Dry-docking

Ship Construction: Rules and Regulations for Bulkheads, Watertight doors, Condition Assessment Scheme and Condition Assessment Programme)

Q. 7 Surveys and Certificates

Q. 8 Welding *(Types, Faults, Tests)*

Q. 9 Corrosion/ Painting

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GOVERNMENT OF INDIA

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)
FUNCTION: CONTROLLING THE OPERATION OF THE SHIP AND CARE FOR PERSONS ON BOARD (Management Level)

PAPER: SHIP SAFETY, EMERGENCIES, MAINTENANCE AND MANAGERIAL SKILLS

TIME: 3 Hours PASS MARKS: 75 MAX. MARKS: 150

Notes:

1. Attempt any 6 questions out of 7.
2. All questions carry equal marks i.e. 25 marks each.
3. Where applicable sketches should be drawn to support the answer.

Questions based on:

Competency No.17: Maintain safety and security of the ship's crew and passengers and the operational condition of life-saving, fire-fighting and other safety systems

17.1 A thorough knowledge of life-saving appliance regulations (International Convention for the Safety of Life at Sea) - LSA Code

17.2 Organisation of fire and abandon ship drills

17.3 Maintenance of operational condition of life-saving, fire-fighting and other safety systems

17.4 Actions to be taken to protect and safeguard all persons on board in emergencies

17.5 Actions to limit damage and salve the ship following a fire, explosion, collision or grounding

17. 6 Safety and Security of the ship's crew and passengers: Safety committee, maintenance of safety equipment, care and maintenance of rope wires, code of safe working practices, dock safety regulation. Reporting of accidents.

17.7 Ship maintenance and repairs: Corrosion prevention, structure of paints and painting areas, Planned maintenance, maintenance of cargo handling equipment

Competency No.18: Develop emergency and damage control plans and handle emergency situations

18.1 Emergency situations

18.1.1 Demonstrates the knowledge of preparation of contingency plans for response to emergencies: Drawing plans to deal with emergencies, legal aspects and seamanship practices.

18.1.2 Understands ship construction with regards to damage control

18.1.3 Explains methods and aids for fire prevention, detection and extinction: Fire prevention procedures, different types of fires and firefighting equipment to be used, fighting fire on different types of ship.

18.1.4 Understands functions and use of life saving appliances: Different types of emergencies, actions taken, life saving appliances and instructions to use it.

Competence No. 19: Use of leadership and managerial skills

19.1 Knowledge of shipboard personnel management and training

19.2 A knowledge of related international maritime conventions and recommendations, and national legislation

19.3 Ability to apply task and workload management, including

19.3.1 planning and co-ordination

19.3.2 personnel assignment

19.3.4 time and resource constraints

19.3.5 prioritization

19.4 Knowledge and ability to apply effective resource management

19.4.1 allocation, assignment, and prioritization of resources,

19.4.2 effective communication on board and ashore,

19.4.3 decisions reflect consideration of team experiences,

19.4.4 assertiveness and leadership, including motivation,

19.4.5 obtaining and maintaining situation awareness

19.5 Knowledge and ability to apply decision-making techniques

19.5.1 situation and risk assessment,

19.5.2 identify and generate options,

19.5.3 selecting course of action,

19.5.4 evaluation of outcome effectiveness

19.6 Development, implementation, and oversight of standard operating procedures

Q. 1. Competence no. 17.1- 17.5 *(SOLAS- LSA)*

Q. 2. Competence no. 17.6 *(SHIP SAFETY AND SECURITY)*

Q. 3 Competence no. 17.7 *(SHIP MAINTENANCE AND REPAIRS)*

Q. 4 Competence no. 18 *(EMERGENCIES)*

Q. 5 Competence no. 18 *(SOLAS- FFA)*

Q. 6 Competence no. 19 *(LEADERSHIP AND MANAGERIAL SKILLS- Motivation, Team working skills, Resource management, Effective Communication)*

Q. 7 Competence no. 19 *(LEADERSHIP AND MANAGERIAL SKILLS- Risk Assessment, Training of personnel, Standard Operating Procedures)*

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GOVERNMENT OF INDIA

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

FUNCTION: NAVIGATION

PAPER: TERRESTRIAL & CELESTIAL NAVIGATION

TIME: 3 Hours PASS MARKS: 140 MAX. MARKS: 200

Notes:

4. All questions in section A & B are compulsory. Answer any two questions from Section C.
5. **All questions carry equal marks.**
6. Use Chart No. --------Nautical Almanac 1992, Deviation card no. ----, Variation -----, ship's speed ----- knots and Height of eye of the observer ---- if not mentioned in the question.
7. Positions of the landmarks are approximate and are for identification only.
8. Use luminous range diagram as necessary.

Part A

Q. 1 Chart Work problems

Q. 2 Chart Work problems

Q. 3 Execution of Passage Plan

Part B

Q. 4 Great Circle/ Composite Great Circle

Q.5 Simultaneous/ Staggered observations

Q.6 Determine position line by celestial observations

Or

Determine position line by celestial observations

Part C

Q. 7 Star suitable for observation (magnitude)/ Star identification

Q.8 Twilights/ Kepler's Law/ Circumpolar bodies/ PZX Triangle.

Q.9 Projections (Gnomonic/ Mercator)

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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 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

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