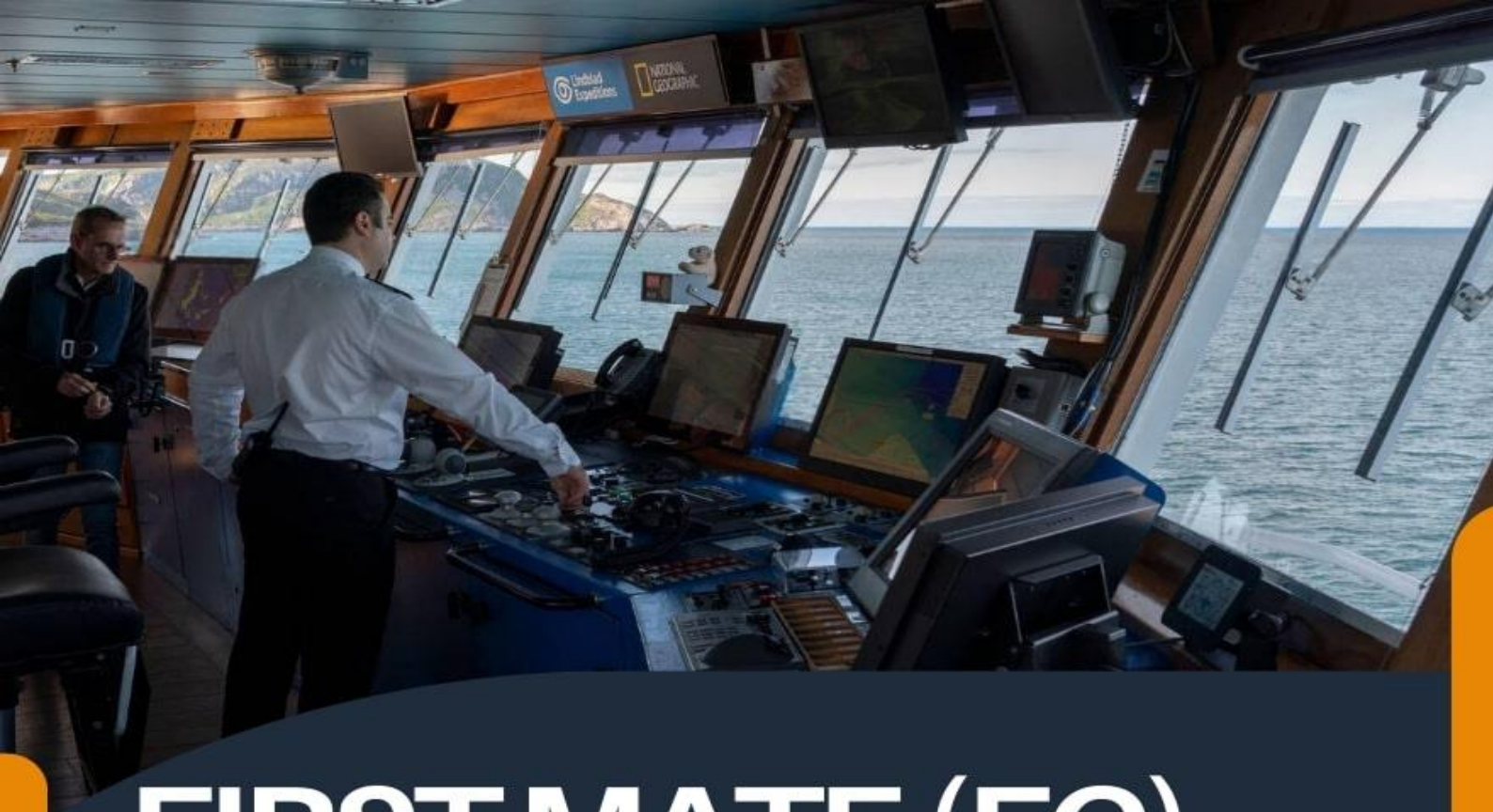

FIRST MATE (FG) PHASE- I WRITTEN :

CARGO (FG)

FOR INDIAN COMPETENCY EXAM

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Date: - 6th Jan-2023

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)
FUNCTION: CARGO HANDLING AND STOWAGE (Management Level)

Notes:
1. Questions 1, 2 and 3 in part A are compulsory. Attempt any five questions from Part B of the remaining seven questions.
2. All questions carry equal marks i.e. 25 Marks each.

PART – A

Q.1 M.V.'Hindship' arrived port in a located condition with drafts F 9.20 m, A 9.30 m, Midship 9.30 m in water density 1.005 t/m3. Calculate quantity of cargo discharged if the ship to sail out with draft of 6.50 m, with an expected hog of 12 cm. The draft marks are 3m aft of forward perpendicular, 1.5 m abaft midships & 5m aft of after perpendicular.
Click Here to See the Answer

Q.2 A box shaped cargo tank 40m x 22m x 18m was observed to have a sounding of 15 cm by sounding rod. Ullage reference point was located at the tank top, 3m forward of aft bulkhead. Vessel was trimmed 1m by stern and LBP of vessel was 255m. Upon completion of loading in the tank, vessel was even keel and ullage of tank by sonic gauge was 1.10m. Calculate the quantity of oil loaded in the tank, if the observed temperature was 30OC and API gravity was 30.5 in both cases.
Click Here to See the Answer

Q.3 a) With reference to Dock Workers (Safety, Health and Welfare) Act 1990 define "authorized person" and "completion person".
b) Describe the factors to be taken in to account during cargo planning stage in order to minimize the damage to watertight transverse bulkheads and tank tops in bulk carriers having combination cargo/ ballast holds.
Click Here to See the Answer

PART – B

Q.4 a) What is a PV breaker? How will you ensure that it is protecting the cargo tanks effectively?
b) You are the C/off to Crude oil tanker. Explain in proper sequence the procedures to be followed for unloading of cargo and COW in an oil tanker.
Click Here to See the Answer

Q.5 a) What are the features of "certificate of fitness" on a Gas/chemical carrier? What is the use of P & A Manual on a chemical tanker?

b) Explain in proper sequence the procedures of preparation and then loading operations of full cargo of LNG.
Click Here to See the Answer

Q.6 What information is required to be provided by shipper when loading packaged dangerous cargoes? What measures will you take to ensure a safe stowage and carriage of explosives?
Click Here to See the Answer

Q.7 What precautions are recommended when loading concentrates as per IMSBC code.
Q.8 a) Describe the procedures to check weather tightness of hatch covers with their advantages and disadvantages.
b) Describe the precautions to be taken if cargo has to be carried under Fumigation.
Click Here to See the Answer

Q.9 a) State the lashing requirements for Timber deck cargo as per Code of Safe Practice for Ships Carrying Timber Deck Cargo.
b) With the help of neat sketch describe general outline of refrigeration system (Brine Cooling) on Reefer ships.
Click Here to See the Answer

Q.10 a) Explain the precautions to be taken when handling dangerous cargoes.
b) Describe the vulnerable areas on ships requiring particular attention against infestation.
Click Here to See the Answer

Date: -11th April-2023 Paper-1

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)
FUNCTION: CARGO HANDLING AND STOWAGE (Management Level)

Notes:
1. Questions 1, 2 and 3 in part A are compulsory. Attempt any five questions from Part B of the remaining seven questions.
2. All questions carry equal marks i.e. 25 Marks each.

PART – A

Q.1 A vessel with a trim of 3.3 mtrs by stern arrived at load port with 8 cms of water in the cargo tank. Dimensions of the tank are 35 m x 28 m x 20 m and LBP of the vessel is 160 m. Location of ullage port is 0.8 m above deck and 4 mtrs from aft bulkhead. The tank was loaded with oil cargo and ullage taken by radar gauge upon completion of loading was 3.27 m at temperature of 27OC. The vessel had a trim of 1.8 m by stern after completion of loading. Location of Radar gauge is 0.5 mtrs above deck and 5 m from aft bulkhead. Density cargo at 15OC is 0.8450 t/cbm. Calculate the quantity of cargo loading in this tank.
Click Here to See the Answer

Q.2 Using ASTM tables, calculate the quantity of white oil in a rectangular tank of a ship of LBP 120m, trimmed 2.5m by the stern. The dimensions of the tank are 35m x 15m x 10m. The ullage port of located 1m above the deck, 3m from the tanks aft bulk head and 2m to the port of the centreline. The ullage was taken by the sonic tape and was measured as 5.7m and a water cut of 10 cm was obtained. The temperature of the oil is 27 Deg C and the density of oil at 15 Deg C is 815 Kg/m3.
Click Here to See the Answer

Q.3 a) Describe requirements for periodic thorough examination and inspection of cargo gear.
b) Describe the maintenance of wire ropes, blocks, shackles, hooks, sheaves, pulleys & slings.
Click Here to See the Answer

PART – B

Q.4 Sketch and describe IG system of a crude oil tanker. List all the alarms associated with it.
Click Here to See the Answer

Q.5 Write notes on following w.r.t. to chemical tankers:
i) Cargo Pumps

ii) P & A Manual
iii) Dedicated / parcel tankers
Click Here to See the Answer

Q.6 a) List out the documents required prior loading IMDG cargo.
b) List down the precautions for loading / unloading Class 1 IMDG cargoes.
Click Here to See the Answer

Q.7 a) Describe the stability criteria for ships carrying grain in bulk without having document of authorization.
b) Define “Separated from” and “Separated by a complete compartment or hold from” as per IMDG Code.
Click Here to See the Answer

Q.8 a) With the help of neat sketches describe securing arrangements of steel coils.
b) With help of neat block diagram explain the refrigeration system (Brine Cooling) on reefer ships.
Click Here to See the Answer

Q.9 a) Describe the hazards associated with coal cargoes and precautions to be taken while carrying it.
b) Explain the purpose and objectives of IMSBC code.
Click Here to See the Answer

Q.10 Describe the general principles and practice to be followed in the stowage & securing non standardized cargoes as given in the code of safe practice for cargo stowage and securing.
Click Here to See the Answer

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Date: -11th April-2023 Paper-2

FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)
FUNCTION: CARGO HANDLING AND STOWAGE (Management Level)

Notes:
1. Questions 1, 2 and 3 in part A are compulsory. Attempt any five questions from Part B of the remaining seven questions.
2. All questions carry equal marks i.e. 25 Marks each.

PART – A

Q.1 M. V. 'Hindship' arrived port with the following drafts F 8.65 m, A 8.89 m, Mid 8.81 m. Density of dockwater 1.016 weights on board: H.O. 350 t, D.O. 135 t, FW 162 t, L.O. 22 t, and unpumpable ballast 54 t the constant and stores as determined on completion of discharge was 160 t. Calculate the quantity of cargo discharged. Draft marks are located 2 m aft of FP 4 m ford of AP and 1 m ford of midship.
Click Here to See the Answer

Q.2 A crude oil tanker of LBP 270 m, has a box shaped cargo tank of dimensions L 40m x B 27m x D 18m. On completion of unloading cargo, the dip was observed as 12 cm, when vessel was upright and trimmed 3m by stern. The sounding pipe was located 5 m forward of the aft bulkhead and 0.9 m above the deck. Calculate the quantity of cargo on board (OBQ).
Click Here to See the Answer

Q.3 a) Describe the test procedures and the means for ensuring weather tightness of hatch covers on bulk carrier to load grain in bulk.
b) Describe the SOLAS 1974 / Loadline 1966 and Class requirements for approved loadicator on board cargo ships.
c) Briefly state the test and certification procedure for approved loadicator.
Click Here to See the Answer

PART – B

Q.4 a) Sketch a general layout of an Inert Gas System of an Oil Tanker and describe its operation step by step.
b) Differentiate between a P.V. Valve and P.V. Breaker in a tanker.
Click Here to See the Answer

Q.5 a) State the content of Procedure and Arrangements (P & A) Manual as required under Annex II of MARPOL 73-78.
b) Explain the operation of the re-liquefaction plant is liquefied gas in tanker.
Click Here to See the Answer

Q.6 Explain the following with respect to IMDG code
a) Dangerous Goods Manifest b) Subsidiary risk label c) Segregation table
d) Stowage Category e) Compatibility
Click Here to See the Answer

Q.7 What are the hazards and procedures for loading coal in a Bulk carrier?
Click Here to See the Answer

Q.8 As per IMO Grain code, describe briefly with sketches various methods of reducing grain heeling moments on a ship loaded with grain.
Click Here to See the Answer

Q.9 a) Prepare a Planned Maintenance System for hatch-covers.
b) What are the lashing requirements for Timber deck cargo as per "code of Safe Practice for Timber Deck Cargo"?
Click Here to See the Answer

Q.10 What all factors are required to be considered into planning and stowage of containers?
Click Here to See the Answer

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FIRST MATE OF A FOREIGN GOING SHIP (PHASE – I)
FUNCTION: CARGO HANDLING AND STOWAGE (Management Level)

Notes:
1. Questions 1, 2 and 3 in part A are compulsory. Attempt any five questions from Part B of the remaining seven questions.
2. All questions carry equal marks i.e. 25 Marks each.

Q.1 M.V. 'Hindship' is at a draft of F 9.20 m, A 9.30 m, mid 9.30 m, in water of RD 1.005. The draft marks are 2 m aft of FP, 1.5 m aft of midships and 3 m ford of AP. She is to shift to a berth where a depth of water is 6.5 m. Vessel is required to have 0.5m of under keel clearance. Calculate: the minimum quantity of cargo to discharge if after discharging that cargo she is expected to sag by 10 cms.
Click Here to See the Answer

Q.2 A box shaped cargo oil tank 30m x 20 m x 15 m is to be loaded with crude oil at the temperature of 24OC. Density at 15OC in vacuum = 0.8550 kg/litre. If 4% of the volume of the tank is to be left for expansion, calculate the quantity of oil loaded and the final ullage by the measuring tape at the ullage port located 2m forward of aft bulkhead, 1m about tank top and 3 m to the port of center line of the tank. LBP = 240M, trim = 3m by astern. List = ½ O(S).
Click Here to See the Answer

Q.3 What all are the procedure for testing derricks and cranes? Describe with an example?
Click Here to See the Answer

Q.4 Explain the complete procedure of heating the cargo on oil tankers covering the commercial / safety / operational aspects of the system.
Click Here to See the Answer

Q.5 Explain the procedure of cargo operation i.e. loading and discharging on LNG? What is re-liquefaction of gas?
Click Here to See the Answer

Q.6 a) What is the purpose of Marking and labelling as per IMDG code?
b) Enumerate the precautions you will observe while loading / discharging dangerous cargo.
Click Here to See the Answer

Q.7 As per IMSBC code what are the precautions to be observed while loading coal cargoes in bulk?
Click Here to See the Answer

Q.8 What are the dangers associated with shipment of grain cargoes. What are the different methods available to reduce shifting of cargoes?
Click Here to See the Answer

Q.9 a) As a chief officer what preparation you will take prior loading vehicle on a RO-RO ship?
b) What is CSC and Customer plate on a container and what all details does it carry? Explain.
Click Here to See the Answer

Q.10 How will you prepare a refer space for loading chilled cargo. Describe the importance of controlling atmosphere in cargo spaces, how it is achieved.
Click Here to See the Answer

FUNCTION: CARGO HANDLING AND STOWAGE (Management Level)

Notes:
1. Questions 1, 2 and 3 in part A are compulsory. Attempt any five questions from Part B of the remaining seven questions.
2. All questions carry equal marks i.e. 25 Marks each.

PART - A

Q.1 M.V. 'Hindship' arrives at a river port in a partly loaded condition with draft F 6.65 m, A 6.95 m, Mid 6.76 m in water of RD 1.010. Calculate the maximum quantity of cargo she can load if she is to sail in summer zone on an even keel in salt water with expected sag of 8 cm. 56 t of fuel and FW will be consumed in port and 20t during down river passage. The draft marks are 2m fwd of FP 2m abaft of amidships and 3m abaft AP.
Click Here to See the Answer

Q.2 Find the final ullage using a UTI gauge, when 3,200 mt of Gas oil (density 0.8860 ts/m3 in vacuum) is blended with 2,300 cubic meters of Diesel oil at 43OC (density 0.8693 ts/m3 in vacuum) in a box shaped tank 28.5m x 18m x 15m (L x B x D) on board a ship of LBP 196.4m, trimmed 1.2 m by head and listed 3 deg to port. Ullage port for this tank is located 5.8 m forward of the after bulkhead 4.7m to stbd of the centerline and 112 cms above the top of the tank. Final temperature on completion of blending was found to be 20Odeg C.
Click Here to See the Answer

Q.3 a) Describe the common damage/ defects that may occur on watertight transverse bulkheads situated at the ends of dry cargo holds on a bulk carrier.
b) Define authorized person, responsible person and loose gears as per Docks workers Safety, Health and Welfare Regulations 1990.
Click Here to See the Answer

PART – B

Q.4 Explain with neat sketch working principle of any type of oxygen analyser & explosimeter.
Click Here to See the Answer

Q.5 a) Explain briefly any five hazards of chemical cargoes & what control measures are taken on chemical tanker to reduce risks from those hazards.
b) Describe with a diagram about a LNG ships membrane tank structure.
Click Here to See the Answer

Q.6 As per IMDG Code, describe following: -
i) EmS
ii) MFAG

iii) Segregation of dangerous goods
iv) Dangerous goods manifest
v) Various types of magazines for carriage of explosives.
Click Here to See the Answer

Q.7 List out the hazards and procedures for loading concentrate.
Click Here to See the Answer

Q.8 As per IMO Grain code describes briefly with sketches various methods of lashing & securing grain in partially filled & fully filled compartments.
Click Here to See the Answer

Q.9 a) Write notes on Bay plans for containers.
b) Explain torsional stresses and how will you rectify it?
Click Here to See the Answer

Q.10 a) What are brine solutions? List out the advantages of a brine trap.
b) What preparations / precautions you will take during voyage in order to protect cargoes which are liable to freeze?
Click Here to See the Answer

Notes:
1. Questions 1, 2 and 3 in part A are compulsory. Attempt any five questions from Part B of the remaining seven questions.
2. All questions carry equal marks i.e. 25 Marks each.

PART A

Q.1 A vessel has loaded grain, stowage factor 1.60m3/t to a displacement of 13674 T. In this loaded condition, the fluid GMT is 0.90 m. All grain spaces are full, except No. 2 tween deck, which is partially full.
The tabulated transverse volumetric heeling moments are as follows:

No. 1 hold 774m4	No.1 TD 608m4
No. 2 hold 929m4	No.2 TD 601m4
No. 3 hold 995m4	No.3 TD 407m4
No. 4 hold 1022m4	

The value of the Kg used in the calculation of the vessel's effective KG were as follows: For lower holds, the centroid of the space, for tween decks, the actual Kg of the cargo.
The righting levers for GZ in meters at angles of heel in degrees are as shown in the table:

Angle of heel	0 5 10 15 20 25 30 35 40 45 50
GZ ordinate	0 0.09 0.21 0.35 0.45 0.51 0.55 0.58 0.59 0.58 0.55

a. Graphically determine the angle of list in the event of a shift of grain.
b. Calculate the enclosed area between the GZ curve and the grain heeling arm line.
Click Here to See the Answer

Q.2 A boxed shaped tank of dimensions 35 x 15 x 10 mtrs had an ullage of 5.7 mtrs at 27OC after completion of loading. Location of ullage port is 1 mtr above the deck, 2 mtrs port of center line and 4 mtrs from aft bulkhead. LBP of the vessel is 120 mtrs. Vessel was listed 2O to port and trimmed 2.5 mtrs by stern at the time of taking the ullage. Density of oil is 0.8150 t/cbm at 15OC. Find:
a. Weight of oil in vacuum
b. Volume of oil in the tank if temperature increases to 36OC during the voyage.
Click Here to See the Answer

Q.3 a. Describe the procedure to check the weather tightness of hatch covers. What is the action to be taken in case of noticing a deformity in the hatch covers.
b. Describe about the register for ships lifting appliances 1990.
Click Here to See the Answer

PART B

Q.4 Explain MARPOL minimum criteria w.r.t. to the number of tanks to be washed, also explain in brief the content of COW checklist.
Click Here to See the Answer

Q.5 a. Describe with neat sketches how a gas tanker is classified by the IGC code as per its survival capability.
b. Define solidifying & high viscous Category "Y" cargoes as per MARPOL Annex II.
Click Here to See the Answer

Q.6 With reference to IMDG Code, describe the following:
a. Shipper's declaration b. Meaning if Segregation table shows 3.
c. IMDG Class 1 stowage requirements on passenger ships.
Click Here to See the Answer

Q.7 a. As per IMO MSC Circular, state what are the reasons for fumigation of cargo holds and the requirements and procedures for in transit fumigation.
b. State under the 13 paragraphs of IMSBC Code Appendix 1, the requirements for carriage of iron ore in bulk on a bulk carrier.
Click Here to See the Answer

Q.8 With neat sketches, explain loading and securing of a diesel generator set weighing 80 Ton tank top of a general cargo ship.
Click Here to See the Answer

Q.9 A container loaded on deck containing IMDG cargo was found to be dripping some of its cargo. A deck hand who went to clean the same inhaled the toxic fumes and collapsed. What actions are required to be taken on board with respect to safety, health and reporting as per IMDG Code considering some cargo was washed overboard. As a Chief officer how would you have prevented this accident.
Click Here to See the Answer

Q.10 Enumerate precaution before loading / during voyage / on delivery of reefer cargoes.
Click Here to See the Answer

Notes:
1. Questions 1, 2 and 3 in part A are compulsory. Attempt any five questions from Part B of the

remaining seven questions.
2. All questions carry equal marks i.e. 25 Marks each.

PART – A

Q.1 M.V. 'Hindship' arrived port with drafts F: 5.80m, Mid: 6.38m & A: 6.80 m, in RD of 1.025. After loading 1250 mt of cargo she sailed on an even keel draft but with 5 cms of hog in seawater of RD 1.025. Calculate her departure drafts F, A & Midships if she sailed in an upright condition after consumption of 9.25 mt/DO. 43mt/FW in port & also replenished 200 mt/FW & 333 mt/HO during her stay at this port.
Click Here to See the Answer

Q.2 A box shaped tank L 30 m x B 18 m x 20 m containing crude oil of density of 15OC – 0.8275t/m3 had an ullage of 1.80 m as measured bv a sonic tape. The ullage port was located at 3 m fwd of the aft bulkhead 1m above the tank top and 2m to port of centreline of tank. Trim observed was 3 m and the vessel listed 1O to starboard. Observed temp 32.5OC. Calculate the quantity of oil in tank if the LBP of vessel was 215 m.
Click Here to See the Answer

Q.3 Explain how weather-tightness is maintained in the Hatch covers and precautions will you take for securing the hatch covers before proceeding to sea?
Click Here to See the Answer

PART – B

Q.4 Write short notes on:
i) Stowage category ii) Compatibility group code
iii) Dangerous cargo Manifest iv) EmS
Click Here to See the Answer

Q.5 a) Why is the Heel maintained on LPG explain in detail? What are coolants and the use these coolants on LPG? What do you understand by the term hot gassing-up?
b) State the contents of Procedure and Arrangements (P & A) manual as required under Annex II of Marpol 73/78.
Click Here to See the Answer

Q.6 With reference to IMDG CODE explain segregation criteria for carriage of dangerous goods. Justify your answers with proper sketches.
Click Here to See the Answer

Q.7 a) Briefly state the classification of solid bulk cargoes as prescribed in the IMSBC code.
b) Enumerate hazards associated with Direct Reduced Iron (DRI) and precaution to be taken while making stowage plan loading on board bulk carrier.
Click Here to See the Answer

Q.8 With reference to 'Code of Safe Practice for Carriage of Grain'.
a) Define: i) Filled compartment ii) Angle suitable compartment
b) Describe briefly various methods of reducing grain heeling moments on a ship loaded with cargo of grainin bulk.
Click Here to See the Answer

Q.9 a) Describe the general principles & practices to be followed in the stowage & securing of non- standardized cargoes as given in the code of safe practice for cargo stowage & securing?
b) With sketch of a bay plan on container ships, describe information's reflected in the plan.
c) Briefly state the requirements of construction of standard containers.
Click Here to See the Answer

Q.10 a) Describe the design, construction & stability requirements of Timber ship.
b) Describe the under deck stowage of logs and its securing arrangements.
c) Significance of voyage planning and ship handling on container ships.
Click Here to See the Answer

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