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

FUNCTION : NAVIGATION

PAPER: TERRESTRIAL & CELESTIAL NAVIGATION (13/01/10)

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

NOTES :

1. All questions in section A &B are compulsory. Answer any two questions from section C.
2. All questions carry equal marks.
3. Use chart No. 5072; Nautical almanac 1992, Deviation card No. 2, variation 6°W, ship's speed 12 knots.
4. Positions of the landmarks are approximate and are for identification only.
5. Use luminous range diagram if necessary.

SECTION – A

Q .1 A vessel steering a course of 260° (T) observed Olands sodra Grund Lt. (latitude 56°04.3'N, longitude 016°41.2'E) bearing 010° (T) at 0400 hours. Again at 0500 hours, the same light bore 040°(T). At 0615 hours, Utklippan lt. (latitude 55°57' N, longitude 015°42'E) bore 315°(T) , find the following:-

a. Position of the ship at 0400 hours and 0615 hours.
b. Course and speed made good.
c. Rate of the current.

Q.2 At 1900 hours from the D.R position latitude 55°03' N, longitude 016°28' E; a vessel obtains an intercept of 2' AWAY on an azimuth of 189°(T). She was steering a course of 330° (T) at 12 knots. Thereafter visibility becomes poor and her radar was functioning only up to 6 miles range. If current was setting 066°(T) at 3 knots when and what should be her next alteration of course so as to pass 6 miles on the northern side of Christianson. Lt. (latitude 55°19.3'N, longitude 015°11.5'E).

Q.3

a. State the rules regarding observance of safety zones
b. State the precautions when navigating near safety zones and offshore oil & gas installations.

...2...

SECTION – B

Q.4 A vessel arrived at her destination in latitude 45°00'N, longitude 150°00'E with a heading of 300° (T) after sailing a distance of 2700 miles along a perfect great circle. Find the initial position and course of the vessel.

Q.5 a) On 19th January 1992 on a ship in DR latitude 20°00'S, longitude 175°00'E; the sextant altitude of sun's upper limb west of the meridian was 57°10, when chronometer showed 02h 50m 12s (chronometer error 2m 12s slow). If index Error was 1.5' off the arc, H.E. was 12m, calculate the intercept and direction of PL.

b) Without working out the sight, find what longitude an observer will get if, the above sight was calculated using longitude by chronometer method.

Q.6 Celestial observations calculated using DR latitude 40°00'N, longitude 060°00'W gave results as follows:-

STAR	TIME	AZIMUTH	INTERCEPT
Star X.	0520hrs.	035°(T)	2.5 Towards
Star Y	0530hrs.	160°(T)	Nil
Star Z	050hrs.	280°(T)	3.0' Towards

If the vessel was steaming a course of 090°(T) at 12 knots, find the position of vessel at 0530 hours. If the height of eye of 25m (assumed) was used in calculating all the above sights, calculate correct height of eye (HE).

SECTION – C

Q.7 a) Explain, why moon is not suitable for amplitude observation.

b) What is the rate of change of sidereal hour angle (SHA) of moon?

Q .8 In latitude 30°00 N, LHATS 330°, an observer noticed the true altitude and true azimuth of sun are 70° and 150° respectively. Find true altitude of sun 5 hours later.

Q .9 a) Define meridional parts.

b) A Mercator chart is to be made to a scale of 1/1200,000 in latitude 40° N. Calculate the distance on that chart between each meridian and each parallel of latitude for the area 39°N to 41°N and 45° E to 47°E.

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

FUNCTION : CONTROLLING THE OPERATION OF THE SHIP AND CARE FOR

PERSONS ON BOARD

PAPER: NAVAL ARCHITECTURE PAPER –I

TIME: 3 Hours PASS MARKS: 100 MAX. MARKS :200

NOTES:Question No.1,2,3, & 4 are compulsory.

1. Attempt any four out of the remaining.
2. All questions carry equal marks.
3. Wherever applicable, sketches should be drawn to support the answer.

1. The areas of ship's water plane are as follows:

Draft (m)	0	1	2	3	4
Area WP(M^2)	650	660	662	661	660

Calculate displacement in SW at 4m draft and FWA at 4m draft.

2. A vessel has been damaged forward and is to be dry- docked in the following condition taking into account effective of damage on hydrostatic data. Water line intersects forward perpendicular at 10.20m, Draft aft 9.00. Vessel touches the blocks 10m aft of the forward perpendicular. KM 11.25 M, KG 10.6, MCTC 440tm, TPC 39.5 , LCF 84m forward of AP, length 176m, displacement 35500t. Find the effective GM of the vessel when she takes the blocks fore and aft. What will be the draft on taking the blocks.
3. M.V. Hindship is floating at a hydrostatic draft of 8.785m, KG 7.807 M, free surface moment 1552mt has homogeneous cargo stowing at 1.78m^3/t in no.3 hold. Consider no. 3 to be cuboidal, (length and breadth of the hold remains constant over the entire length) of length 21m and breadth 20m. The cargo in this compartment shifts, raising the surface on the starboard side by 1.5m and lowering the surface on the port side by the same amount. Draw the curve of statical stability and hence determine her list.
4. Sketch & label and describe a corrugated watertight bulkhead. Explain the advantages of corrugated bulkhead over flat bulkhead.
5. Discuss the effect of beam on freeboard and depth of a vessel.
6. List and describe methods of testing a weld?
7. What is enhanced survey programme and its purpose? Describe enhance survey requirements for bulk carriers. What are the preparations will you carry out for a bulk carrier of 15 years old.
8. With sketch describe an "Impressed current corrosion protection (ICCP) system on board a ship.
9. Describe the requirements of watertight doors in a passenger ship as required by SOLAS' 74 as amended.

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

FUNCTION : CONTROLLING THE OPERATION OF THE SHIP AND CARE FOR

PERSONS ON BOARD

PAPER: SHIP SAFETY, DAMAGE CONTROL AND MANAGEMENT (08/01/10)

OF PERSONNEL

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

NOTES:

1. Attempt any 5 questions out of 6.
2. All questions carry equal marks.
3. Where applicable sketches should be drawn to support the answer.

1. Your loaded crude oil tanker sustains a hole in way of a cargo tank whilst berthing at an inadequately fendered wharf. A quantity of cargo has spilled overside. List all actions you will take to protect your interest. Give a list of parties to be informed and the documentation that will be necessary under the MARPOL convention.
2. A) What is the purpose of 'on board training'? discuss the advantages of carrying out regular drills on board.

   B) When conducting safety frills, what special points would you consider in order to make it effective?
3. A) As a chief officer, prepare a checklist for maintenance of hatch covers.

   B) Explain different type of test carried out to check the condition of hatch covers.
4. Describe the following as per MARPOL?
   a. Double hull tankers and alternative designs
   b. The criteria for discharge from machinery space and cargo tank spaces.
5. As chief officer of a newly acquired vessel, describe in detail how you would go about organizing and ensuring safety in compliance with requirement of SOLAS.
6. As a chief officer, what measures/steps would you take in order to integrate the various human resources available on board a ship for effective team performance?

****

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

FUNCTION : CARGO HANDLING AND STOWAGE (07/01/10)

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

NOTES:

1. Question 1 and 2 are compulsory, attempt any six questions of the remaining questions.
2. All question carry equal marks.

1. A box shaped tank L 35m ×B 20m × H 20 m containing crude oil of density at 15° C = 0.8135 tonnes / cubic metre had an initial ullage of 0.35 m as measured by a radar beam level gauge fitted 2m forward of aft bulkhead on the centre line of the tank. Trim = 1m by stern, observed temperature 35° C. On completion of discharge ullage was noted as 19.85, trim = 3.5 m by stern. Calculate the quantity of oil discharged if the LBP of the vessel was 235m.
2. Three sheer legs each 10m, 10m & 10.5m long form a tripod. Their heels form an equilateral triangle of each side 6m. Find the thrust along each leg and the minimum size of 6×12 wire to be disadvantage, effort acting vertically.
3. 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?
4. What is charge separation? How does it take place on oil tankers? Explain the hazard associated with this and the precautions to be taken.
5. A) List and explain at least 10 points from the ISGOTT ship/shore safety check list.
   B) Explain in brief the contents of the COW manual.
6. What precautions are necessary on board prior to, during loading, during carriage and while discharging the following cargoes:
   a) cotton b) sulphur
7. As per IMO code of safe practice for cargo stowage and securing:
   a) Enumerate the actions, which may be taken in
   i) Heavy weather and ii) When there is shift of cargo
   b) Enumerate the guidelines for safe stowage and securing of heavy cargoes.
8. A) Describe the requirement for reporting of accidents as per dock worker's (Safety health and welfare) regulations.
   b) Describe the methods used for testing the weather tightness of hatch covers with their advantage and disadvantages.
9. A) What certificates are carried by a live stock carrier?
   B) What lashing arrangements can be made for grain in a partly filled compartment?

****

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

FUNCTION : NAVIGATION

PAPER : METEOROLOGY (11/01/10)

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

NOTES:

1. Question No.1 is compulsory.
2. Attempt any four questions from the remaining.
3. All questions carry equal marks.
4. Use ATT 1992.

---

1. Find the height of tide at Cape Town harbour on 6th march 1992 at 0830 local time by harmonic constant method.
2. A) What are gradient currents and how are they formed?

   B) With the aid of suitable diagram, describe the current circulation in the Mediterranean sea and bay of Bengal?
3. (a) List the areas where tropical storms frequently occur, together with the local names for the storm. Why is the tropical region of South Atlantic Ocean free from tropical storms?

   (b) Briefly explain the use of safety sectors for keeping a ship clear of the path of a tropical storm.
4. Describe the method of the shipboard weather routeing giving an appropriate illustration.
5. Write short notes on following:
   a. Climate routeing
   b. Buys ballot law.
   c. Facsimile recorder.
6. Describe the icebergs of the arctic region and the usual path they take.

   What are the signs of approaching an iceberg? What action will you take on seeing these signs?