INDIAN MARITIME UNIVERSITY

(A Central University, Government of India)
END SEMESTER EXAMINATIONS – DECEMBER 2019

B.Sc. (Nautical Science)

Semester: IV

UG21T3402- Ship Stability Paper-II

Date: 02-01-2020 Max Marks: 70
Time: 3 Hours Pass Marks: 35

Note:
Question no. 1 is compulsory.
Solve any 6 questions from remaining 7 questions.
All Questions carry equal marks.
Use of M.V. Hindship Stability Particulars booklet and non-programmable Scientific Calculator are permitted. Graph paper to be provided by Exam Centre, if required.

1. Answer to the point: (5 x 2 = 10 marks)
   a. Define COF.
   b. State the wall sided formula
   c. State Simpsons 1st rule & it's use.
   d. Define Angle of loll.
   e. State the formula for FWA.

2. A ship 90 m long is floating at drafts 4.5m F and 5.0 m A. The centre of flotation is 1.5 m aft of amidships, TPC = 10 tonnes and MCTC = 120 tm. Find the new drafts if total weight of 450 tonnes is loaded in a position 14m forward of amidships. (10 Marks)

3. a) A box shaped vessel is 80 m long, 15 m wide and floats in salt water at drafts F 3.00m, A 5.00m. Find the change in volume of displacement when the vessel passes to FW. State with reasons if the trim of the vessel would change or not.

   b) Calculate the moment of statical stability using wall sided formula, given the following data:
   Displacement: 16161 t, KB: 4.144m, KM: 8.240m, KG: 7.32m,
   Angle of heel: 25 degrees. (2x5=10 Marks)

4. a) What do you understand by a curve of statical stability ? What are the various information that may be obtained from it?

   b) Find the Displacement in SW of a barge 48 m long whose under water tansverse cross sectional areas are: 19.6, 25.0, 17.5, 13 and 0 m^2. (2x5=10 Marks)

5. a) Enumerate the precautions that needs to be taken to keep a vessel with timber deck cargo stable at all times.

   b) Define grain cargo. What are the dangers associated with carriage of grain in bulk? (2x5=10 Marks)

6. a) Enumerate the remedial actions in proper sequence in case vessel takes to angle of loll during the voyage.

   b) Define TPC & derive the formula for calculating TPC of a vessel.

(2x5=10 Marks)

7. M.V.Hindship, is floating in water of RD 1.012 with a freeboard of 4.42m. Calculate her displacement. (10 Marks)

8. Find the moment of statical stability of M.V.Hindship at an angle of heel of 7 degrees, when displacing 16133 t, KG 7.57m, FSC 0.085m using KN value. (10 Marks)

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