INDIAN MARITIME UNIVERSITY

(A Central University Government of India)

END SEMESTER EXAMINATIONS-June/July 2019

BSc (Nautical Science)

Ship Stability Paper - II

UG21T3402

Semester IV

Date: 26.06.2019 **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 Institute, if required.

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1. Answer to the point: (5 x 2 = 10 marks)
   a. State the formula for finding out MCTC.
   b. State Simpsons 3rd rule & it's use.
   c. State 2 dangers associated with a ship carrying deck cargo.
   d. With the help of a diagram, define Angle of repose.
   e. Find KN value of M.V.Hindship, given displacement 16250 t and angle of heel 20 degrees.

2. A ship of LBP 220m, displacement 15000t has a draft Fwd 7.7 m Aft: 8.9m. MCTC 250tm. TPC 22 t. COF 3m aft of amidships.

   500 t of cargo is discharged from each of the following 3 holds:
   No. 1 hold, COG 65m forward of H.
   No. 2 hold, COG 40 m forward of H.
   No. 5 hold. COG 80m aft of H.
   (where "H" is the point amidships)

   250 t Fuel oil is received in No. 2 DB tank, COG 40 m forward of H. Find new drafts F & A.

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 new drafts if the vessel now passes into Fresh water.

   b) Calculate the moment of statical stability, given the following data: Displacement: 28,000 t, KN: 4.94m, KM: 8.285m, KG 7.332m, FSM

1552tm, Angle of heel: 30 degrees.

4. a) From the information of M.V. Red XYZ, plot the curve of statical stability and from the curve find the following:
The range of stability, Maximum Righting Lever and the angle of heel at which it occurs

Displacement: 35000 tonnes, KG 8.9m, FSM: 3500 tm,

Heel	5	10	15	20	30	45	60	75	90
KN	0.9	1.9	3.2	4.4	6.5	8.75	9.7	9.4	8.4

b) The areas of vertical transverse sections of a forward hold, spaced equidistantly between bulkheads, are as follows:
800, 960, 1100, and 1120 square metres respectively.
The length of the hold is 20m. Find how many tonnes of coal (stowing at 4 cubic metres per tonne) it will hold.

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

b) Write short notes on "Document of Authorization" and it's importance in grain loading.

6. a) With the help of neat diagrams, show how a vessel takes to angle of loll.

b) Define MCTC & with the help of a neat diagram, derive the formula for calculating MCTC of a vessel.

7. M.V.Hindship in condition No. 7 is listed 3^{o} to port . No. 7 DB tank starboard is then filled with DO, cg 3.8m from CL. Calculate the final list.

8. M.V.Hindship floating at a draft of F 5.62m, A 6.78m. A weight of 220 tonnes is then shifted from No. 3 TD to a position 112.5 metres forward of AP. Calculate the final drafts F & A.