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**INDIAN MARITIME UNIVERSITY**  
(A Central University, Government of India)

December 2016 End Semester Examinations  
Diploma in Nautical Science - Second Semester (2015 batch onwards)

**Ship Construction & Ship Stability – II (UD11T3204)**

Date : 17.12.2016

Maximum Marks: 70

Time: 3 Hrs

Pass Marks : 35

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Note: Answer any 3 out of 4 questions from Section A and any 4 out of 5 questions from Section B. All questions carry equal marks (7 x 10 = 70 marks)  
Use of Hindship booklet and non-programmable scientific calculator is allowed

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**SECTION – A**  
(Ship Construction)

- 1) Sketch and label a profile view with a profile view of RO-RO ship showing mid ship ramp arrangement, stern ramp arrangement, car decks, D.B. arrangement, slope ways & gastight zones. (10)
- 2) a. List out the contents of a ship's capacity plan. (5)  
b. Draw a simple sketch of a double bottom tank and show solid floors, bracketed floors, side girders and pipe tunnel. (5)
- 3) With neat sketch explain the following stresses, including the part of the ship affected and measures taken during ship construction to counter them: (5x2=10)
  - a. Pounding
  - b. Panting
- 4) Draw a Sketch of a typical forecastle mooring and anchoring arrangements (hawse pipe, spurling pipe, cable stopper, bitter end, chain locker.) (10)

**SECTION – B**  
(Ship Stability)

- 5) With neat sketch define the following: (2.5 x 4 = 10)
  - a. Centre of buoyancy
  - b. Righting lever
  - c. Unstable Equilibrium
  - d. Free surface effect
- 6) A ship of 8000 t displacement has KB=3.5m, KM=6.5m and KG=6.0m. Find her moment of Statical stability at 8° heel, assuming that her deck edge remains above water. (10)

- 7) A vessel has two deep tanks, port & starboard, each 12 m long, 5 m wide and 8 m deep. The port side tank is full of SW while the starboard side tank is empty.  $W=9840$  t,  $KM=8.5$ m,  $KG=8.0$ m. Calculate the GM fluid if SW is transferred from port to starboard tank until each tank has equal quantity of water. (10)
- 8) M.V. Hindship floating at a hydrostatic draft of 6.10m is listed  $2\frac{1}{4}^\circ$  (two and one fourth degree) to port,  $GM(F)$  is 0.491m. Where with respect to her center line, should 100 tonnes be loaded bring her upright? (10)
- 9) M.V. 'Hindship' floating at a mean draft of 5.5m,  $KG$  7.53m. FSC in final condition is 0.104m. She has to load 1200 tonnes of cargo in No.2 hold and No.2 TD. Find the amount of cargo to be loaded in each space to complete the ship with a  $GM(F)$  of 1m. (10)

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