

INDIAN MARITIME UNIVERSITY
(A Central University Government of India)
END SEMESTER EXAMINATIONS-JUNE/JULY 2019
Diploma in Nautical Science
Semester II
Ship Construction and Stability - II
(UD11T4204)

Date: 27-06-2019

Time: 2 hours

Max. Marks: 70

Pass Marks: 35

Note:

Part – A : Question no. 1 is compulsory. Answer any 2 out of remaining 3 questions.

Part – B : Question no. 5 and no. 6 are compulsory. Answer any 2 out of remaining 3 questions.

Use of non- Programmable Scientific Calculator & M.V. Hindship Stability Particulars booklet are permitted.

Part A – Ship Construction

1. Write Short Notes on: (5x 2 = 10 Marks)
 - a) Sheer strake and stringer plate
 - b) Flare
 - c) Sheer Force and Bending moments (only definitions)
 - d) Hatch cleating arrangement
 - e) Sounding pipes

2. a) Sketch and label an elevation of a Ro-Ro ship showing midship ramp arrangement, stern ramp arrangement, car decks, DB tanks and slope ways. (5 Marks)

- b) Describe Racking stresses and its causes. (5 Marks)

3. a) Explain the term "Pounding" and ship areas involved with Pounding. (5 Marks)

- b) Sketch and label a typical Air pipe of a Ballast tank. (5 Marks)

4. a) Describe the content of Capacity Plan. (5 marks)

- b) Sketch and label a typical forecastle mooring and anchoring arrangements showing hawse pipe, spurling pipe, cable stopper, bitter end, chain locker and leads of moorings. (5 Marks)

Part B – Ship Stability

5. Write Short Notes: (5x 2 = 10 Marks)
- Stable equilibrium
 - Stiff Ship
 - Effect of slack tank on Stability of a ship
 - Formula for finding List on ship
 - Centre of buoyancy
6. M.V. "Hindship" floating at a displacement of 8420 tonnes, has a free surface moment of 1542 tm. Find her GM (Fluid) if KG = 7.651m. (10 Marks)
7. A vessel has two deep tanks, P & S, each 12m long, 5 m wide and 8 m deep. The port side is full of SW while the starboard side is empty. W = 9840t, KM = 8.5m, KG = 8.0m. Find GM(Fluid) if SW is transferred from P to S until each tank has equal quantity of ballast. (10 Marks)
8. A ship listed 8 ° to Port, displaces 12000 t and has KM 7.54m, KG 6.8m. Find how many tonnes of SW ballast must be transferred from No. 2 DB (P) to No. 2 DB(S) to upright the vessel. The tank centres are 10 m apart. (10 Marks)
9. a) Draw a ship with unstable equilibrium and mark position of B,G,M and the forces of gravity acting vertically downwards and buoyancy acting vertically upwards. (5 Marks)
- b) A ship of 3200 t displacement, KG 6.2m, loads 5200 t of cargo (KG 4.8m). Find the amount of deck cargo (KG 10.4m) that can be loaded so that the KG shall be 6.0m when loading is completed. (5 Marks)
