**INDIAN MARITIME UNIVERSITY**

(A Central University Government of India)

**END SEMESTER EXAMINATION – JUNE-JULY 2019**

**DIPLOMA IN NAUTICAL SCIENCE**

**Semester-II**

**Ship Construction and Stability - II**

**(UD11T3204)**

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**Date: 27.06.2019** **Max. Marks: 70**

**Time: 2 hours** **Pass Marks: 28**

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**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.**
**All Questions carry equal marks.**
**Use of non- Programmable Scientific Calculator & M.V. Hindship Stability Particulars booklet are permitted.**

## Part A – Ship Construction

Q1. Write Short Notes (5x 2 = 10 Marks)

a) Camber
b) Sheer
c) Rise of Floor
d) Save all Trays
e) Run

Q2. (5 x 2 = 10 Marks)

(a) Sketch a double hull Tanker and label Pump room, Ballast tank, Engine Room, Collision bulkhead, Fore Peak tank, Fuel oil bunker tank, Cofferdam and Cargo Tank.
(b) Describe Racking Stress and it's causes.

Q3. (5 x 2 = 10 Marks)

(a) Write 5 information/data you will input to a Lodicator (stress calculation machine) and 5 results the Lodicator will give you.
(b) Sketch an anchoring arrangement showing hawse pipe, spurling pipe, cable stopper, bitter end and chain locker.

Q4. (5 x 2 = 10 Marks)

(a) Draw and label a longitudinal framed double-bottom tank structure.
(b) Describe and Sketch bilge strum box.

## Part B – Ship Stability

Q5. Write Short Notes (5x 2 = 10 Marks)

a) Righting moment
b) Free Surface Effect
c) Stiff ship
d) Transverse Metacentre
e) Centre of Gravity

Q6. M.V. 'Hindship' floating in Condition No.7, discharges the entire cargo in No.2 TD and fills in the Bulbous Bow with 186.6 tonnes of water ballast, Kg 3.52. Assuming theoretically that the deck cargo of locomotives was shifted to No.2 TD and also No.4 (P & S) DB tanks were slackened, increasing the FSC by 0.035 m, calculate the final GM (fluid) of the ship.

(10 Marks)

Q7. On a ship of 12000 mt displacement KG 8.2 m, a weight of 300 mt is to be loaded on the tween deck (KG 12 m) using ship's crane whose head is 30 m above the keel. Find the KG of the ship (a) after the cargo is lifted by the ship's crane to a height of 2m from the tween deck and (b) after loading. (10 Marks)

Q8. A ship displacing 15000 mt has KM 9.70 m, KG 7.20 m. She is now listed to 8° stbd. She has port and starboard deep tanks, each 10 m long, 10 m wide and 8 m deep. The port side deep tank, which was full of salt water, is pumped out until it's sounding is 2 m. Assuming that no other tanks on the ship are slack, find the final list. (10 Marks)

Q9. (5 x 2 = 10 Marks)

(a) With help of a diagram explain what do you understand by 'Righting Lever'.

(b) A homogenous log of wood of 0.5 m square section floats in water of RD 1.005 at a draft of 0.4 m with one of it's faces horizontal. Find the vertical distance between it's COG and it's COB in water of RD 1.020.

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