INDIAN MARITIME UNIVERSITY

(A Central University, Government of India)

End Semester Examination Dec 2019/Jan 2020

B. Sc. (Nautical Science))

Semester-III

UG21T2309– Naval Architecture - III

Date: 16.12.2019 **Max Marks: 70**

Time: 3 Hours **Pass Marks: 35**

Note: Use of non-programmable Scientific Calculator is permitted
Use of M.V.Hindship Table is permitted.

Part– A (Ship Construction) Marks: 35

Note: Question No. **1** is Compulsory and Carries **15 marks**.
Answer any **Two** of the remaining **Three**, each carries **10 marks**.

Q1. a) Describe "Transverse framing system" on ships. (5 marks)
b) Describe "Numbering system of hull plating" used for identification on Merchant ships. (10 marks)

Q2. Sketch and describe construction of "Hawse Pipe" of a ship. (10 marks)

Q3. a) What is the purpose of "BILGE KEEL" on a Merchant Ship? (4 marks)
b) Sketch and explain the construction. (6 marks)

Q4. Sketch "AIR PIPE" and "SOUNDING PIPE" of Double Bottom Tank. Label the parts and explain the construction. (5 marks)

Part– B (Ship Stability) Marks: 35

Note: Question No. **5** is Compulsory and Carries **15 marks**.
Answer any **Two** of the remaining **Three**, each carries **10 marks**.

Q5. (a) State and explain "Simpson's First Rule" for finding "Water Plane Area" of a ship.
(5 marks)
(b) Find the volume of a lower hold 20m long whose transverse cross-sectional areas at equal intervals from forward are 120, 116, 101 and 80 square meters.
(10 marks)

Q6. Define "Centre of Gravity" and "Centre of Buoyancy". When a vessel is rolling and pitching at Sea, Discuss the shift of positions of "Centre of Gravity" and "Centre of Buoyancy" of a ship. (10 marks)

Q7. A ship 90m long is floating at drafts 4.5m F and 5.0m A. The centre of flotation is 1.5m aft of amidships. TPC 10 tonnes. MCT 1cm. 120 tonnes m. Find the new drafts if a total weight of 450 tonnes is loaded in a position 14m forward of amidships.
(10 marks)

Q8. M. V. 'Hindship' arrives at a port in water of RD 1.012 with drafts F 6.15m, A 7.22m. Her sailing draft in water of RD 1.025 was F 5.33m, A 5.98m. Calculate the weight of cargo discharged at that port, if 85 tonnes fuel and fresh water were consumed in the port. (10 marks)

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