

**INDIAN MARITIME UNIVERSITY**  
(A Central University, Government of India)  
**END SEMESTER EXAMINATIONS –DECEMBER 2018**  
**B.Sc (Nautical Science)**  
**Semester-V**  
**NAVAL ARCHITECTURE PAPER -I (UG21T3502)**

Date: 28-12-2018

Maximum marks: 70

Time: 3 hours

Pass marks : 35

**Note: Q.NO 1 is Compulsory.**

ATTEMPT ANY SIX OUT OF THE REST.

ALL QUESTIONS CARRY EQUAL MARKS.

NON PROGRAMMABLE SCIENTIFIC CALCULATOR IS PERMITTED

- 
- Q1) Write short notes on the following. (5 x 2 marks)
- a) Bending moment
  - b) permeability
  - c) Torsional stress
  - d) Shearing force
  - e) Inclining experiment.
- Q2) a) Discuss the effect of "moment of inertia" on ship. (5 marks)
- b) A ship's waterplane is 18 metres long. The half ordinates at equal distance from forward are as follows 0,1.2,1.5,1.8,1.8,1.5, and 1.2 Metres respectively. Find the second moment of the waterplane area about the centre line. (5 marks)
- Q3) a) One side of a tank is a vertical, rectangular bulkhead 15m long & 10 m High. Find KP(the height of the cop above the bottom of the tank)when the tank has SW in it to a sounding of 9m. (5 marks)
- b) Explain with suitable sketch parallel axis theorem (5 marks)
- Q4) a) How the loss of buoyancy is compensated during bilging.(5 marks)
- b) A box shaped vessel 220m x 36m is afloat in SW at an even keel draft of 10m.KG=12m.An empty tank 1.8m high, 20m long & 18m wide situated Centrally, is bilged. Find the GM before and after bilging. (5marks)
- Q5) a) What is the critical period during drydocking.what are the dangers associated during this period. (5 marks)
- b) A ship of 4000tonnes displacement,126m long, has KM=6.7m and KG=6.1m.the centre of flotation is 3m aft of amidships,MCTC=120 tm.Find the maximum trim at which the ship may enter a dry dock if the minimum GM at the critical instant is to be 0.3m. (5 marks)

Q6)a) Explain the difference in stress and strain on ship while the ship is in Still water and seaway. (5 marks)

b) Discuss in detail the effect of shearing force and bending moment on ships strength. (5 marks)

Q7)a) A light beam 8 m long is supported at its ends. If a mass of 10.1937 kg is placed at its centre, draw the SF and BM diagrams to scale. (5 marks)

b) Why the an inclining experiment is conducted explain with the procedures. (5 marks)

Q8)a) Explain with diagram the effect of increasing the beam on the stability of the ship. (5 marks)

b) Explain with diagram the effect of increasing the freeboard on the stability of the ship. (5 marks)

Q9)a) How loadicator helps in cargo planning, operation and damage conditions. (5 marks)

b) Loadicator has reduced the chances of human error "discuss". (5 marks)

\*\*\*\*\*