

INDIAN MARITIME UNIVERSITY
(A Central University, Government of India)
End Semester Examinations Dec 2019
DIPLOMA IN NAUTICAL SCIENCE (DNS)
Semester : II

Ship Construction and Stability – II (UD11T2204)

Date: 12-12-2019

Max Marks: 70

Time: 2 Hrs

Pass Marks: 28

- Answer any 3 out of 4 questions from PART A and any 4 out of 5 questions from PART B.
- All questions carry equal marks.
- Use of Hindship booklet and non-programmable scientific calculator is allowed.

PART - A: SHIP CONSTRUCTION

1. Sketch side elevation of a container ship. (5+5 = 10)
Label the following parts: Fore peak tank, DB tanks, Containers on hatch covers, Cargo holds, Machinery space.
- 2.a. Explain briefly the following terms used in ship Construction: (2 x 3 = 6)
 - i) Aft Perpendicular
 - ii) Parallel middle body
 - iii) Flare
- b. With the help of a neat sketch, show the connection of a deck beam with a transverse frame and name all the parts. (4)
3. a. What do you understand by sagging stresses? Explain causes of static as well as dynamic sagging ? (5)
- b. What do you understand by Racking stresses? Explain with the help of a neat diagram. (5)
4. What do you understand by unbalanced rudder? Sketch and label an unbalanced rudder. (10)

PART - B: SHIP STABILITY

5. a) Draw a neat, labelled diagram to show stable equilibrium. (5)
- b) What do you understand by the term "Metacentric Height" & what is the relationship between Metacentric height and Righting lever for small angle of heel (θ)? (5)
6. On a vessel of 18000 t displacement, KM 8.9m, KG 8.3 m, a DB tank is partly full of FW. If the tank surface is rectangular, 20 m long and 18 m wide, calculate her GM (Fluid). (10)

7. A ship of 12500 tonnes displacement KM 7m, KG 6.4m has a 3 degree list to starboard. DWT available is 1000 tonnes. There is space available in no. 3 hold, 6 m either side of the centre line (KG 3.5m). Calculate the distribution of cargo in each side to complete loading upright & Final KG of the vessel.

(6 + 4 = 10)

8. A ship of LBP 200m, displacement 14000t has a draft Fwd 8.4 m Aft: 8.8m. MCTC 200tm. TPC 25 t. COF amidships. 500 t of cargo is discharged from each of the following 2 holds:

No. 1 hold, COG 60m forward of COF.

No. 5 hold, COG 30 m aft of COF.

150 t Fuel oil is received in No. 5 DB tank, COG 40 m aft of COF. Find new drafts F & A.

(10)

9. M.V.Hindship arrives at port where the density of water is 1.014 t/m³ at an even keel draft of 6.72m. She sails at a draft of F 7.2m, A 7.3m. 120 tonnes of FW was received and 40 tonnes of (Fuel and FW) were consumed in port. Calculate weight of cargo loaded at that port.

(10)
