Indian Maritime University

June 2022 End Semester Examinations

Programme Name : B Sc (NS)

Subject Name : - SHIP STABILITY PAPER - II

Subject Code : UG21T4402

Max Marks : 70 Pass Marks : 35 Time 3 Hrs

Date – 03.06.2022

Part A is compulsory – 10 MCQs (10 X 01 Mark)

Q.1

i. To press up all double bottom tanks and lower the center of gravity of a vessel suspected of being in a state of loll, you should first fill:
   a) The low side of each of the double bottom tanks.
   b) Both sides of all double bottom tank simultaneously.
   c) The high side of each of the double bottom tanks.
   d) The high side of all double bottom tanks simultaneously.

ii. The initial GM of a ship loading grain should be
   a) 0.25
   b) 0.18
   c) 0.30
   d) None

iii. The stability booklet of a ship contains
   a. Draft
   b. Displacement
   c. Kg
   d. All The Above.

iv. The aft draft marks of a vessel is more than the forward, then vessel is trimmed by
   a. Head
   b. Stern

c. Even Keel
d. None Of the Above

v. DOA stands for
a. Daily officers' allowance
b. Document of authorization
c. Document of action
d. None

vi. Angle of loll can be corrected by
a. Jettisoning
b. Deballasting
c. Ballasting
d. All the above.

vii. Simpsons rule is used to find
a. Area
b. Volume
c. COG
d. All the above

viii. Load-line is checked after loading to ensure that a vessel has adequate:
a. List
b. Freight
c. Reserve buoyancy
d. Displacement

ix. Which one of these is a deck cargo?
a. Timber
b. Grain
c. Coal
d. Oil

x. Equation used to calculate GZ
   a. GZ=GM*tanθ
   b. GZ=GM*cosθ
   c. GZ=GM*sinθ
   d. GZ=GM*cotθ

Part B is compulsory – 5 Short Questions (05 X 02 Marks)

Q.2

i. What is trim? Does a vessel sailing normally have any trim?
ii. What is center of flotation? Where is its location?
iii. How does change in density affects trim?
iv. What is angle of loll? What danger is associated with ship at angle of loll?
v. Define stiff and tender vessel.

Part C – 7 Long Questions-Answer Any 5 (05 X 10 Marks)

Q.3

A ship left port drawing 8.2 m & 10 m F & A. LBP 160 m, TPC 32, MCTC 220 tm HF 2.4 m aft. Find the arrival drafts F & A if, enroute, it consumed:
420 t HFO from No: 4 DBT (HG 35 m aft)
220 t HFO from No: 7 DBT (HG 60 m aft)
200 t FW from No: 1 DBT (HG 60 m fwd.).

Q.4

a) Explain moment of statical stability at small angle of heel.
b) A ship of 4000 t displacement has KG 5.1 m, KB 2.1 m, KM 5.5 m. Find the moment of statical stability when she heels 24 degrees, assuming that she is wall-sided.

Q.5

a) What all information can be obtained from curve of statical stability?
b) Explain how does shifting of weight from forward to aft in deck changes trim with the help of a neat diagram.

Q.6

a) What is Document of Authorization (DOA)?

b) What are the Intact stability criteria for carrying grain as per grain code?

Q.7

Draft (m)	5	4	3	2	1	0
TPC	22.6	22.2	21.6	20.9	19.7	14.6

Find W and KB at 6 m SW draft. Using Simpsons Method.

Q.8

a) Differentiate stiff and tender vessel.

b) What precautions can be taken while carrying deck cargoes?

Q.9

a) What all remedial action can be taken if a vessel is at angle of loll?

b) A box-shaped vessel 100 * 12 * 8 m is lying at an angle of loll of 18 degrees If the mean draft is 4m, find its KG.