UNIVERSITY OF RUHUNA

Faculty of Engineering

End-Semester 6 Examination in Engineering: May 2026

Module Number: MN 6212 Module Name: Ship Hull Design and Simulation (TE) (C-23)

[Three Hours]

[Answer **All Questions**, each question carries **14 Marks**]

This question paper contains **Five (05)** questions in **Two (02)** pages.

Start your answers to each question on a fresh page.

[Provide sketches where necessary, make reasonable assumption and state them clearly]

Q1 (a) Briefly explain five (05) different types of steel sections use in ship building with aid of sketches.

[05 Marks]

(b) With reference to primary and secondary structural members of a ship hull, define the following with aid of sketches.

i). Deck Beams

[02 Marks]

ii). Garboard Strake

[02 Marks]

iii). Keel strake

[02 Marks]

(c) List down the advantages of using Mild Steel in the ship building process.

[03 Marks]

Q2 With reference to ship lines plans and offsets drawings.

(a) Classify three (03) Lines Plan with an aid of a diagram.

[03 Marks]

(b) Define the following,

i). Shell expansion plan

ii). Capacity plan

[06 Marks]

(c) Briefly describe transverse framing system of a ship with a labeled diagram.

[05 Marks]

Q3 (a) Briefly describes the six degree of freedom for a ship with an aid of a sketch.

[04 Marks]

(b) With reference to vibrations of ships.

i). List down the sources of vibrations of ships.

[03 Marks]

ii). Briefly explain torsional vibrations in a main propulsion installation.

[04 Marks]

iii). List down the methods for reduced effects of torsional vibrations of the main propulsion system.

[03 Marks]

Q4 (a) Draw and name main components of a propulsion system.

[04 Marks]

(b) i). List down three (03) types of boat Propulsion Systems.

[03 Marks]

ii). Discuss the advantages and disadvantages of Controllable Pitch Propeller over Fixed Pitch Propeller.

[03 Marks]

(c) Draw and name bilge keel construction of a ship.

[04 Marks]

Q5 With reference to ship tank Stabilizers,

(a) i). Briefly explain the basic working principal of tank Stabilizers with an aid of a sketch.

[04 Marks]

ii). Discuss the advantages and disadvantages of Tank Stabilizers on board ship.

[03 Marks]

(b) List down the advantages of a double hull design, specifically regarding environmental protection and structural integrity.

[04 Marks]

(c) Explain three (03) types of Boat hulls with aid of sketches.

[03 Marks]