UNIVERSITY OF RUHUNA

Faculty of Engineering

End-Semester 7 Examination in Engineering: August 2018

Module Number: ME7311 **Module Name: Advanced Marine Engineering**

[Three Hours]

[Answer **all questions**; each question carries **ten marks**]

Provide neat sketches where necessary; state any reasonable assumptions made

Q1 a) With reference to steering gears state the rules and requirements to be satisfied by such systems.

[4.0 Marks]

b) Sketch and describe the operation of a Ward Leonard Electric Steering Gear system.

[4.0 Marks]

c) Distinguish clearly the operation between follow up and non-follow up steering gear systems.

[2.0 Marks]

Q2 a) Distinguish clearly the difference between bracket floor and solid floor giving suitable sketches.

[4.0 Marks]

b) With reference to structural sub-assemblies, sketch an arrangement of a General Cargo Ship showing brackets, stiffeners, beams, decks, floors, shell bracket floors, solid floors, etc.

[4.0 Marks]

c) Show in a sketch both the longitudinal and transverse framing of a ship.

[2.0 Marks]

Q3 a) Sketch and describe high pressure water spray system for combating fire in passenger spaces on a ship.

[5.0 Marks]

b) Sketch a foam portable fire extinguisher and explain its operation indicating operating time, chemical reaction, area of coverage and recharging after use.

[3.0 Marks]

c) List the reasons that could cause a fire onboard ship.

[2.0 Marks]

Q4. a) Name the components of a transmission line of a ship.

[2.0 Marks]

b) State with reasons why the shaft line is angled downwards.

[2.0 Marks]

c) Draw a lay out of a typical shaft line as in (b) and all member components attached to it.

[4.0 Marks]

d) Distinguish the difference between solid built-in and controllable pitch propellers.

[2.0 Marks]

Q5 a) Sketch and describe a single duct air conditioning system fitted to a dry cargo ship.

[4.0 Marks]

b) State the influence of processes heating, cooling, ventilating, humidifying and dehumidifying during hot and cold climates.

[2.0 Marks]

c) A more accurate heat load or heat gain calculation for any type of room or building is carried out before sizing an air conditioner. Describe steps used in heat load calculation giving necessary formula.

[4.0 Marks]

Q6 With reference to crank shaft fitted to Marine Diesel Engines,

a) State type of crank shafts and explain their construction differences in detail.

[4.0 Marks]

b) Prepare a list of causes for crank shaft deflection

[2.0 Marks]

c) Explain the procedure employed to check deflection of a crank shaft.

[4.0 Marks]