



UNIVERSITY OF RUHUNA

Faculty of Engineering

End-Semester 5 Examination in Engineering: December 2020

Module Number: ME5311

Module Name: Marine Engineering Knowledge

[Three Hours]

[Answer all questions, all questions carry equal marks]

Sketches should be clearly labelled

Q1. With reference to oily water separators:

- (a) Sketch, Turbo Oily Water Separator handling large quantities of contaminated water and explain its operation indicating the separation process in first stage and coalesce function in second stage.

[5 Marks]

- (b) Explain the purpose of having an Oily Water Separator onboard ship.

[3 Marks]

- (c) Explain the automatic operation of Oily Water Separator giving a diagrammatic sketch of the system.

[4 Marks]

- Q2. (a) Explain the function of Feed, Bilge, Ballast, General Service, Circulating, Sanitary, Fuel Oil Transfer and Fuel Oil Pressure Pumps mounted onboard ship.

[3 Marks]

- (b) Sketch and describe the operation of a Centrifugal Pump.

[5 Marks]

- (c) Describe the operation of a Plate Type Heat Exchanger with suitable sketches.

[4 Marks]

- Q3. (a) Sketch and describe a Waste Heat Recovery Evaporation Plant using main engine jacket water as the heating medium.

[6 Marks]

- (b) With reference to process of evaporation write short notes on followings:
- (i) Boiling Type Evaporation
 - (ii) Flash Type Evaporation

[3Marks]

- (c) Explain the necessity of fitting a Dump Valve, Ejector Condenser and Distillate Cooler in an evaporator system.

[3 Marks]

- Q4. (a) Sketch and explain the Vapour Compression Cycle of Refrigeration System.

[5 Marks]

- (b) State the type of cooling methods used in ships refrigeration.

[4 Marks]

- (c) Sketch and describe the operation of a Thermostat and Electric Liquid Valve.

[3 Marks]

- Q5. (a) Sketch and describe the construction and operation of a Tank Type Boiler.

[5 Marks]

- (b) State the function of the following components of a boiler,

- (i) Furnace.
- (ii) Blow Down Valve
- (iii) Combustion Chamber

[3 Marks]

- (c) List the mountings fitted to a boiler and explain their necessity briefly.

[4 Marks]