



UNIVERSITY OF RUHUNA

Faculty of Engineering

Mid-Semester 5 Examination in Engineering: June 2015

Module Number: ME 5326

Module Name: Marine Engineering Knowledge (TE)

[Two Hours]

[Answer all questions, each question carries five marks]

- Q1. a) Explain the operation of a Scotch boiler with a suitable sketch. [1.0 Marks]
- b) Draw a Tubular type water level gauge glass and explain gauge glass blowdown procedure. [2.0 Marks]
- c) Discuss the constructional difference between Scotch and Cochran boilers. [1.0 Marks]
- d) Marine Engineers with sea experience are usually appointed as Power Plant managers, Star hotel maintenance engineers, Heavy industry plant engineers etc in shore based industries. Discuss the validity of the statement with reasons. [1.0 Marks]
- Q2. a) Sketch and describe the construction and operation of D type bent tube watertube boiler. [2.0 Marks]
- b) Prepare a list of mountings installed on boilers. [1.0 Marks]
- c) Distinguish the difference between a De-superheater and an Atempurator. [0.5 Marks]
- d) State the purpose of the following components and their respective location on boiler.
i) Three safety valves
ii) Three water level gauge glasses
iii) Two blow down valves [1.5 Marks]
- Q3. a) State classification of all pumps used in marine practice. [1.5 Marks]
- b) Sketch and describe the operation and construction of a Positive Displacement Gear pump used in a pumping system. [2.0 Marks]
- c) Describe the necessity of a relief valve installed in a pump.

(1) [0.5 Marks]

d) Explain steps taken to balance the hydraulic thrust of a gear pump.

[1.0 Marks]

Q4. a) Explain the operating sequence of a Single pass composite Cochran boiler.

[2.0 Marks]

b) Why does the temperature of superheated steam need to be controlled below 435°C?

[1.0 Marks]

c) Explain the steps taken in controlling superheat steam temperature with ESD I and ESD II Boilers.

[1.0 Marks]

d) Describe the function and construction of water walls arranged in furnace.

[1.0 Marks]