



UNIVERSITY OF RUHUNA

Faculty of Engineering

End-Semester 7 Examination in Engineering: July 2016

Module Number: ME7311

Module Name: Advanced Marine Engineering

[Three Hours]

[Answer all questions, all questions carry equal marks]

Sketches should be clearly labelled

- Q1 a) Sketch a vertical watertight door installed in a watertight bulkhead of a ship and explain its constructional details. [2 Marks]
- b) Describe the remote operation of the watertight door with aid of hydraulic circuit diagrams. [4 Marks]
- c) With reference to Crankshaft fitted to Marine Diesel Engines, prepare a list of causes for Crankshaft deflection. [4 Marks]
- d) Explain the procedure employed to check deflection of a crankshaft. [2 Marks]
- Q2 a) With reference to transmission line of a ship explain,
(i) Shafting line is angled and lubricating oil tank is left open to shaft even at stay.
(ii) Plummer blocks are of different designs on according to their location. [2 Marks]
- b) Sketch a water lubricated stern tube and explain its operation. [6 Marks]
- c) Draw a diagram to show type of stresses that shafts are subjected to. [2 Marks]
- d) Draw a sketch to show types of cavitation caused on a propeller. [2 Marks]
- Q3 a) Categorize the air compressors according to the Number of stages, Cooling Method & Medium, Drive Types, Lubrication Method and Service Pressure. [2 Marks]
- b) State the intended purposes in using main air compressors onboard ship. [2 Marks]

c) State with reasons the necessity of unloading a compressor and occasions do unloading.

[2 Marks]

d) What are the numerous reasons to cause following troubles with double stage reciprocating air compressors?

(i) Compressor noisy

(ii) First stage discharge pressure low.

[6 Marks]

Q4 a) With reference to steering gears explain why multi piston variable stroke pumps (hele-shaw) are used rather than rotary positive displacement pumps with controlled recirculation or delivery.

[2.5 Marks]

b) Sketch and describe the operation of a Telemotor System used in steering gear system.

[7 Marks]

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

[2.5 Marks]

Q5 a) State causes of fire generated onboard ships.

[2 Marks]

b) Identify the classes of fire and prepare a list of extinguishers used to combat respective fires.

[2 Marks]

c) Explain the operation of a Chemical Foam Type Portable Extinguisher and its application onboard ship.

[4 Marks]

d) Write short notes on following

(i) General information displayed on an extinguisher.

(ii) Steps taken to avoid a fire onboard ship.

[4 Marks]