



UNIVERSITY OF RUHUNA

Faculty of Engineering

End-Semester 7 Examination in Engineering: August 2015

Module Number: ME 7333

Module Name: Advanced Marine Engineering (TE)

[Three Hours]

[Answer all questions, each question carries 10 marks,
Clearly labelled sketches will be given credit]

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- Q1. a) Categorize air compressors according to the Number of stages, Cooling method and medium, Drive types, Lubrication method, and Service Pressure. [02 marks]
- b) State the intended purposes of using main air compressors in onboard ship. [02 marks]
- c) State the necessity of unloading a compressor and occasions do unloading with reasons. [02 marks]
- d) What are the reasons to cause following troubles with double stage reciprocating air compressors?
- i) Unusual compressor noise
- ii) Low pressure in first stage discharge [04 marks]
- Q2. a) State classes of fires and methods of combating them. [02 marks]
- b) Describe the operation of a fixed fire installation type high pressure water sprinkling system with a clear labeled diagram. [04 marks]
- c) Sketch and describe a Chemical Foam type portable fire extinguisher giving suitable chemical reactions caused during operation, indicating operating time, area of coverage and recharging after use. [04 marks]
- Q3. a) Sketch and describe the operation of a Telemotor system used in steering gear system. [04 marks]
- b) Distinguish clearly the operation between follow up and non-follow up steering gear systems. [02 marks]
- c) Explain the procedure adopted in checking deflection of a crank shaft of a Marine Diesel Engine. [04 marks]

Q4. a) Sketch a vertical watertight door and frame showing the manner of attachment to the bulkhead and the additional reinforcement carried by the door to compensate for the load and stress.

[04 marks]

b) Describe the hydraulic means of closing the above door with suitable diagrams.

[04 marks]

c) With the help of a sketch, briefly describe the types of cavitations which propellers are susceptible to.

[02 marks]

Q5. a) Prepare a list of parameters plotted in psychrometric chart and draw leading lines to represent the same in the chart.

[02 marks]

b) Sketch and describe the construction and operation of a single duct Air conditioning system installed onboard cargo ship. Detail the position of automatic condition sensing devices and explain how these operate to control the machine.

[05 marks]

c) Draw a valve timing diagram for a four stroke marine diesel engine showing lead, lags and overlaps clearly on it.

[03 marks]