



**B.Tech. Degree VI Semester Regular/Supplementary Examination in
Marine Engineering April 2021**

**MRE 1605 MARINE REFRIGERATION AND AIR CONDITIONING
(2013 Scheme)**

Time: 3 Hours

Maximum Marks: 100

(5 × 20 = 100)

- I. (a) What are the thermodynamics cycles that form the basis of refrigeration systems? Explain the refrigeration process with the help of sketches. (12)
(b) How is the performance of a refrigeration plant estimated? (8)
- OR**
- II. (a) Which are the different systems used for refrigeration of edible items for domestic consumption carried on board? (10)
(b) Explain Sub-cooling and Superheating in a vapour compression type of Refrigeration Plant. (10)
- III. (a) Explain the refrigeration system used for cargo in a Liquefied Gas Carrier. (10)
(b) How is the heat load calculation of a refrigeration plant carried out? (10)
- OR**
- IV. Write short notes on:
(a) Coefficient of Performance. (5)
(b) Montreal Protocol. (5)
(c) Effect of refrigerants in earth's environment. (5)
(d) Cryogenics. (5)
- V. Explain with the aid of sketches the different items provided in a refrigeration plant in order to ensure safety of the plant. (20)
- OR**
- VI. (a) How does a cargo refrigeration system differ from the domestic refrigeration system used for provision on board the ship? (10)
(b) Explain with the aid of sketches the insulation arrangement of a refrigerated cargo hold. (10)
- VII. (a) Explain Dalton's Law of Partial Pressure, Amagat's Law of Partial Volume and Gibb's Law. (12)
(b) What are the differences between Gravimetric Analysis and Volumetric Analysis of gas mixtures? (8)
- OR**
- VIII. Write short notes on:
(a) Relative Humidity. (5)
(b) Absolute Humidity. (5)
(c) Dew Point. (5)
(d) Cooling Towers. (5)
- IX. (a) What are the requirements of an Air Conditioning System on board a vessel? How are these requirements met? (12)
(b) What are the different ways the conditioned air is circulated in the accommodation of a ship? (8)
- OR**
- X. (a) Explain with the aid of sketches:
(i) Pump Room ventilation in an oil tanker. (5)
(ii) CO₂ Room ventilation in a ship. (5)
(b) How is the Heat Load calculation of an air-conditioning plant carried out? (10)