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B.Tech. Degree VI Semester Supplementary Examination in Marine Engineering June 2016

MRE 605 MARINE REFRIGERATION AND AIR CONDITIONING

Time : 3 Hours

Maximum Marks : 100

(5 × 20 = 100)

- I. (a) Explain with sketches the ideal cycle for compressors. (8)
 (b) Derive an equation, with the help of PV diagram, for the work done in a two stage air compressor with clearance volume. (12)

OR

- II. (a) Describe the condition for minimum work input and perfect intercooling for a compressor. (10)
 (b) Explain in detail the effect of clearance volume on the volumetric efficiency. (10)

- III. (a) Explain the importance of reliquefaction in a gas carrier ships. Describe in detail any two methods used for refrigeration in liquefied gas carriers. (12)
 (b) What is coefficient of performance in the refrigeration system? Describe the methods used for improving the same. (8)

OR

- IV. (a) Write short notes on (i) Refrigerating effect (ii) New refrigerants. (10)
 (b) Describe in detail the desired properties of refrigerants commonly used in ships. (10)

- V. (a) Explain with the help of a sketch the methods of air circulation in cargo holds. (10)
 (b) Describe the various controls and safety equipments used in refrigeration system. (10)

OR

- VI. (a) Write short notes on (i) charging of refrigerant in a domestic refrigeration plant (ii) thermostatic expansion valve (iii) different types of insulating materials used. (12)
 (b) Explain the factors affecting refrigerated cargo. (8)

- VII. (a) Distinguish between Gibb-Dalton law and Amagat's law with reference to mixtures of gases and vapours. (10)
 (b) Write short notes on (i) equivalent molecular weight (ii) importance of relative humidity and dew point in air conditioning system. (10)

OR

- VIII. (a) Explain the advanced problems in adiabatic maxing of gases. (10)
 (b) Enumerate the principle of cooling towers and air leakage problems. (10)

- IX. (a) Describe the psychrometric properties of comfort conditions in air conditioning. (10)
 (b) Explain with a sketch dual duct system of air conditioning used onboard ships. (10)

OR

- X. Write short notes on (i) balancing of temperature and air quantity in air conditioning system (ii) heat load calculation of air conditioning plant. (20)