AMMV06 MARINE REFRIGERATION AND AIR CONDITIONING

UNIT-1 RECIPROCATING COMPRESSORS

1.1 Ideal cycle for compressors work transfer in a single stage compressors- mass flow

1.2 Volume flow- free air delivery- effect of clearance and volumetric efficiency in single stage compressors.

1.3 Multi stage compression neglecting clearance volume.

1.4 Condition for minimum work input and perfect inter cooling.

1.5 Tandem in line arrangements in compressors. Air motors.

UNIT-2 BASIC REFRIGERATION AND AIR CONDITIONING

2.1 Reversed Carnot cycle- vapour compression cycle- refrigerating effect

2.2 Co-efficient of performance- cooling capacity

2.3 Refrigerants used in marine practice and their justification- rating of refrigeration plant

2.4 Methods for improving C.O.P.

2.5 Use of vapour tables- applied problems

UNIT-3 MARINE REFRIGERATING PLANTS

3.1 Typical marine refrigerating plants with multiple compression and evaporator system

3.2 Heat pump cycles- refrigeration in liquefied gas carriers- applied problems.

UNIT-4 MARINE AIR CONDITIONING

4.1 Principles of air conditioning

4.2 Psychrometric properties of air- comfort conditions

4.3 Control of humidity- airflow and air conditioning capacity- calculation for ships plants.

UNIT-5 BASIC DESIGN OF HEAT EXCHANGERS

5.1 Introduction- types- LMTD and NTU method

5.2 Double-pipe, shell and tube type, condenser and evaporator- problems

References Books:

1. D.A. Taylor, "Introduction to Marine Engineering", 2nd Edition, Butter Worth, London,1993.
2. J.R. Stott, "Refrigerating Machinery and Air Conditioning Plant", 1st Edition, The Institute of Marine Engineers, London, 1974, Reprint 1998.
3. Ghoshdastidar, P.S., " Heat transfer", 2nd Edition, Oxford University Press, 2012