AMMV05 MARINE ELECTRICAL MACHINES-I

UNIT-1 PRINCIPLES OF D.C. MACHINES AND GENERATORS

1.1 Principles of DC machines- construction- winding and e.m.f equations- armature reaction- commutation- brush shift- compensating winding

1.2 D.C. generator- their characteristics-methods of excitation- parallel operation- performance equations.

UNIT-2 D.C. MOTORS

2.1 D.C. Motor- their characteristics- starting and reversing- speed- torque equations- starters- speed control including electronic method of control

2.2 Testing of D.C. machines for finding out the losses and efficiency

2.3 Braking of D.C. motor, Ward-Leonard control.

UNIT-3 TRANSFORMERS

3.1 Transformers- types and applications- operating principle- e.m.f. Equations- phase diagrams under no load and load conditions

3.2 Leakage resistance- equivalent circuits- voltage regulation- losses and efficiency- open circuit and short circuit tests- parallel operation- three phase transformers

3.3 Core and shell type- current and potential transformers- auto-transformers (single phase and three phase) - specification of coolants

UNIT-4 INSTRUMENTS AND TESTING

4.1 Basic requirements of measuring instrument-static and dynamic characteristics of measuring instruments

4.2 Principles of indicating instruments- control and damping devices – moving coil and moving iron instruments and their use as voltmeters and ammeters

4.3 Dynamometer type wattmeter- thermocouple type ammeter, voltmeters and wattmeter. Extension of instrument range.

UNIT-5 DISTRIBUTION AND TRANSMISSION SYSTEMS

5.1 Two wire and three wire D.C. distribution- A.C. Transmission- single and three phase

5.2 Comparison of D.C. and A.C. transmission- use of balancer- 2-wire, 3-wire and 4- wire A.C. distribution

5.3 Copper efficiency under different modes of distribution- one end fed and ring main distributor- fuses and its materials

5.4 D.C. air circuit breaker – A.C. air circuit breakers.

References Books:

1. Uppal S.L., “Electrical Power”, 13th Edition, Khanna publishers, Mumbai, 2002.
2. Berde M.S.,”Electric Motor Drives”, 1st Edition, Khanna Publishers, Mumbai, 1995.
3. W. Laws, “Electricity Applied to Marine Engineering”, 4th edition, The Institute Of Marine Engineers, London, 1998.