B. Tech Degree VI Semester Examination in Marine Engineering June 2011

MRE 602 MARINE ELECTRICAL TECHNOLOGY

Time : 3 Hours Maximum Marks : 100

I. (a) Discuss rules and regulations governing electrical machineries on board. (10)

(b) Describe a typical static Excitation Compounded System. State its advantages over other systems. (10)

OR

II. (a) Draw a system diagram of a typical distribution system showing
- (i) Main generator
- (ii) Emergency generator
- (iii) Shore supply
- (iv) Transformers (10)

(b) Describe a typical emergency source of power on board stating its requirements and the loads fed by them. (10)

III. (a) Describe a main switch board highlighting its general requirements and specific requirements for generator panels. (10)

(b) Describe a typical HV generation and distribution system on board. (10)

OR

IV. (a) Explain the differences between the following motor enclosure.
- (i) Drip Proof
- (ii) Totally enclosed
- (iii) Deck water tight
- (iv) Flame proof (10)

(b) Sketch a graph of starting current and torque against the speed of rotations for a single cage motor. (10)

V. Sketch and describe any three of the following:
- (i) Water tight door operations
- (ii) E/R telegraph
- (iii) Rudder angle indicator
- (iv) Megger (20)

OR

VI. (a) Explain regulations for different navigation lights. (10)

(b) Sketch a typical control of windlass with 3ϕ squirrel cage induction motor using DOL starter with facilities for reversal of rotations and electromagnetic braking. (10)

VII. (a) What is a short circuit and how it develops in
- (i) a generator
- (ii) an external circuit (10)

(b) How will you minimize occurrence of short circuit in each case? (10)

OR

VIII. (a) Describe a routine maintenance carried out on AC induction motor. (10)

(b) Describe periodic survey requirements in respect of the following:
- (i) ACB
- (ii) Steering gear
- (iii) Emergency source of power
- (iv) UMS operation (10)

IX. Describe a diesel electric propulsion system using 3ϕ synchronous motor stating its advantages. Differentiate between use of synchronous motor and induction motor in respect of their use for propulsion system. (20)

OR

X. (a) Explain "Ex" protection and how its requirements are carried out in respect of type of gases and ignition temperature. (10)

(b) Explain "Ex" protected equipment types and their use in different dangerous zones. (10)

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