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***B.Tech. Degree VI Semester Examination in Marine Engineering  
May 2019***

**MRE 1602 MARINE ELECTRICAL TECHNOLOGY  
(2013 Scheme)**

Time: 3 Hours

Maximum Marks: 100

(5 × 20 = 100)

- I. (a) Explain why, upon impact loading self-excited compounded alternators provide the best response, in limiting voltage dip and recovery time (10)
- (b) Draw and explain a PMG excited brushless alternator with AVR control. (10)
- OR**
- II. (a) With reference to an emergency sources of power in passenger ships, describe typical sources and its requirements. (10)
- (b) Give a list of essential services, which must be supplied from emergency generator. Describe also care and maintenance done on emergency batteries and battery room. (10)
- III. (a) Describe a main switch board on board the ship with safeties incorporated. (10)
- (b) Give a procedure for giving shore supply to a ship dry docked. (10)
- OR**
- IV. (a) (i) Name different types of motors used on board giving their applications. (5)
- (ii) State five differences between an Induction motor and a Synchronous motor. (5)
- (b) Draw and explain the following characteristic curves for a squired cage motor. (10)
- (i) Current Vs Speed
- (ii) Torque Vs Slip
- V. (a) State rules and regulations for a Rudder angle indicator and explain how it works. (10)
- (b) With a circuit diagram explain rules and regulations for Navigation lights. (10)
- OR**
- VI. (a) With a circuit diagram explain a Windlass/Capstan Control with built in overload protection and E/M brake. (10)
- (b) Sketch and describe how water tight doors are operated stating requirements. (10)
- VII. (a) Sketch and describe an instrument used for measuring insulation resistance and explain how it is used to measure insulation resistance of a star connected motor. (10)
- (b) Describe method of salvaging a motor affected by Sea water. What IR value do you expect for a low voltage motor after overhauling? (10)

OR

(P.T.O.)

- VIII. (a) In your opinion state two parameters that cause failure of an electrical equipment and state steps you take to avoid them. (10)
- (b) Describe a method to detect an earth fault in a lighting distribution board on board the ship. (10)

- IX. (a) Explain advantages of electric propulsion system. (10)
- (b) Describe with sketch a Turbo electric propulsion system. (10)

OR

- X. Give a brief description on *any four* of the following with suitable sketches wherever applicable. (4 × 5 = 20)
- (i) Intrinsically safe equipment
  - (ii) Earthed Vs Insulated neutral system
  - (iii) Air Circuit Breaker
  - (iv) Preferential tripping system
  - (v) Instrument transformers
  - (vi) What is reverse power and how will your test reverse power.

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