

INDIAN MARITIME UNIVERSITY
(A Central University, Government of India)

May/June 2016 End Semester Examinations
B.Tech. (Marine Engineering)

Sixth Semester – Marine Electrical Technology (UG11 T1603/T2603)

Date : 14.06.2016

Time: 3 Hrs

Max Marks: 100

Pass Marks : 50

Part-A

(3 x 10 = 30 Marks)

Compulsory Question

- 1) a) Why Brushless excitation system is preferred on board ships?
- b) What precautions you will take while testing insulation resistance of a brush less generator rotor (field winding)? Justify.
- c) What is the significance of a Neutral Earthing resistance (N.E.R.)? Draw a circuit to show the position of N.E.R. in a high voltage generation system using earthed neutral system.
- d) What are the indications of a fully charged lead acid battery?
- e) While taking the shore supply on board ship, what is the importance of checking the phase sequence of the incoming supply?
- f) Explain the functions of an automatic voltage stabilizer?
- g) Explain the protective devices provided on induction motor?
- h) What is Earth fault?
- i) What is meant by 'Ex' protection
- j) List the various types of explosion proof requirement.

Part - B

(5 x14 = 70 Marks)

Answer any five of the followings

- 2) (a) You have a multimeter with you .You need to measure A.C. voltage between two potential points in an electric circuit. Draw the internal circuit of the multimeter and write step wise how will you measure the said voltage? What is the importance of zero adjustment?. How it is done?
- (b) How will you check the insulation resistance of an induction motor? Draw sketches to show various measuring points.
- (c) What maintenance you will carry out on an alternator to keep it in good working condition. (5+4+5)
- 3) (a) A diesel Electric propulsion ship has a Synchronous motor as drive for the propeller. Power supply to the propulsion motor is from an A.C. generator, which generates power at constant voltage and frequency. Explain with a neat diagram how the system fulfils the requirements of manoeuvring i.e., (i) Variable speed (ii) Direction of rotation (Ahead & Astern)
- (b) What is intrinsically safe circuit ? Where are these circuits used on a tanker? (11+3)
- 4) (a) What measures are taken to safeguard against electric shock in case of portable tools and hand lamps on board ship? If a person suffers an electric shock, falls and become unconscious. What first aid must be given to the victim?.
- (b) During watch keeping on board ship what measures you will take to ensure safety and reliability of you electrical machineries. (7+7)

- 5) A general cargo ship is provided with an all electric steering gear. It works on the ward Leonard principle. Draw a labeled circuit diagram and explain its working. (14)
- 6) What is the significance of a Salinometer on board ship? Explain its working with a neat circuit diagram. If the temperature of the condensate sample water increase from 25 °c to 35 °c due to rise in sea water, what will be it's effect? How the error is taken care off? Explain briefly. (10+4)
- 7) a) What will be the effect on electrical equipment and motors, if the shore supply voltage and frequency is higher than the ship's rated voltage and frequency?
b) A passenger ship is provided with an emergency generator. It starts automatically and supplies to the emergency loads connected to it, in case the main power fails.
Draw a circuit to show the arrangement and briefly explain the operation of the system. (6+8)
- 8) (a) Draw and explain the synchronous transmitter and receiver.
(b) Draw and explain the portable oxygen analyser. (7+7)
