

INDIAN MARITIME UNIVERSITY
Time Bound Assignment September/October 2020
B Tech (ME) Arrear Examinations
Marine Electrical Technology
UG11T2603

Date: 24/09/2020
Time: 3 Hrs

Maximum Marks: 70
Pass Marks: 35

Part – A (compulsory)
Answer the following (10x2=20 Marks)

- 1** As regards Generator, Why brushless excitation is preferred on board?
- 2** What should be the capacity of fuel oil tank of an emergency generator on a Passenger ship?
- 3** A, 10 Amp. motor operates from a 220 volt insulated neutral system. The supply cables have a total impedance of 0.01Ω . If:
a) an open circuit fault,
b) an earth fault occurred, what circuit current will flow in each case?
- 4** What do you mean by sequential starting of motor? Give two examples.
- 5** What is the significance of Oxygen analyzer on board a tanker?
- 6** The insulation resistance measurement of the winding of a machine is ideally done, while the machine is hot. Justify the statement.
- 7** Can we use a D.C. motor as a drive for the propulsion of a large Ocean Going ship?
- 8** Pertaining to a tanker, define Hazardous area and normally safe area?
- 9** As regard merchant ships what is high voltage (A.C. & D.C.)? Which all ships use high voltage?
- 10** As regards electric shock which is more dangerous AC or DC?

Part – B

Answer any 5 out of 7 questions (5 x 10= 50 marks)

- 11** As regards generator field excitation why we need a system of carbon brush and slip ring? To start main engine plant, Jacket cooling pump motor (Induction motor) is started. What types of power the motor draws from the generator? Briefly explain what will be the effect of these powers on the generator and its prime-mover (Diesel engine). How these effects are normalized?
- 12** Pertaining to shore supply on board ship answer the following:
- a) Where will you locate the shore connection box?
 - b) What checks & precaution you will take before taking the shore supply on the main bus bar?
 - c) What will be the consequences, if the phase sequence of the shore supply is incorrect? If incorrect, what will be your action?
 - d) If the shore supply is at higher voltage, what can be the consequences? What will be your action?
- 13** a) What type of distribution system used on board ship? Differentiate between earthed neutral system and an insulated neutral system using simple diagrams. Why an insulated system is preferred on board ship?
- b) Enumerate the safety devices provided on a motor, in order to protect it under faulty conditions. Draw a thermal OCR (over current relay) and explain how it works.
- 14** What is the significance of an Engine room Telegraph? Explain the working of an electric telegraph with the help of a neat diagram.
- 15** A cage rotor type Induction motor got flooded with sea water. After clearing the water, when you measured the insulation resistance of the winding, it shows 50Ω . What will you do to put back the motor into service?
- 16** A diesel electric propulsion ship has a Synchronous motor as a 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 requirement of manoeuvring i.e., (a) Variable Speed (b) Direction of rotation of the propeller (ahead & astern)

17 a) What do you mean by hazardous Zone on tankers? Enlist the various Ex protected equipments that can be safely used in the respective zones.

b) What is the significance of Neutral Earthing Resistance (NER) in a high voltage system? Draw an arrangement to show the location of the NER. How will you calculate the ohmic value of the NER to be used for a 3 phase generator, rated as 5MW, 0.8 pf, 6.6 Kv?

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