Course	B.E – EEE(M)
Semester	V
Subject Code	UAEE507
Subject Name	MARINE ELECTRICAL TECHNOLOGY

UNIT-I

PART A

1 What is Megger?
2 Mention the Uses of Megger
3 How the smoke detecters are working?
4 What is the use of OCR in generator?
5 Define windlass.
6 Write down the condition for parallel operation of alternator.
7 What is dead ship condition?
8 What is meant by load sharing?
9 What is the role of emergency generator?
10 How to check up a Megger is working in good condition?
11 what is CT and PT?
12 Draw the governor droop characteristics
13 what is the function of governor in AVR?
14 What is voltage dip and recovery voltage?
15 What is AVR?
16 What is an alternator?
17 what is the use of earth relay?
18 what is OLR?
19 what are protective devices?
20 Write the specification of generating plant in ship.

PART B

1 Explain the load sharing of alternator.
2 Explain the ship environment and factors to be considered for machine erection.
3 List the primary essential services in ship.
4 Explain the classes of winding insulation.
5 Compare main generator and emergency generator in ship.
6 Briefly explain the construction and working of megger.
7 Explain the governer droop characteristics.
8 Explain the standard output voltage and frequency for on board operation.
9 List the secondary essential services in ship.
10 Explain the operating principle of main generator.
11 What would be the equivalent shock current levels be at 25V and 250V. Note: the typical body resistance of a person is about 5000Ω at 25V falling to about 2000Ω at 250V.
12 Explain the droop characteristics of AVR.
13 Explain how fire will be detected in the engine room.
14 Explain the over current protection of generator with relevant diagram.
15 What is reverse protection? When it is operated? Explain the working principle?

PART C

1 Explain the ship electrical layout with a neat sketch.

2 With a neat sketch explain the operation of automatic voltage regulator.

3 Explain emergency power supply system with basic diagrams.

4 With a neat sketch explain generator protection.

5 Explain Brushless alternator with necessary diagram.

6 What are the fire precautions carriedout in engine room. Explain in detail?

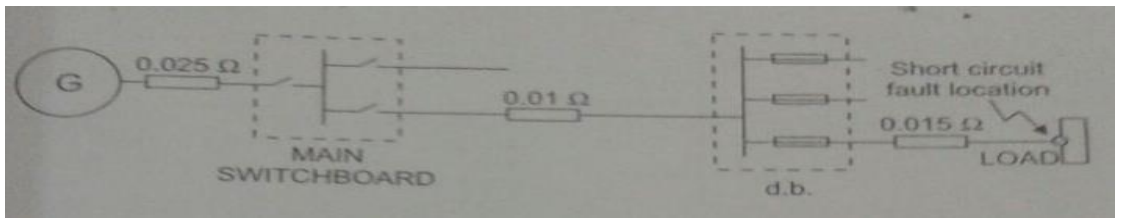
UNIT-II

PART A

1 What is over heat protection?
2 What are the safeties associated with main switch board?
3 What is the purpose of bilge alarm?
4 List some precautions to be followed while connecting shore supplies to ship.
5 What is shore supply? Where it is used?
6 What is ballast system?
7 What is MSB?
8 Write down the condition for parallel operation of generator.
9 What is the use of synchronization control in MSB?
10 When a generator will act as a motor?
11 What is MSB bus tie?
12 What is engine room ventilation?
13 What are the methods which can be followed for synchronizing two alternators?
14 List the types of circuit breaker.
15 What is the difference between a fuse and a circuit breaker?
16 What is a circuit breaker?
17 What is blackout?
18 Write any two differences between ACB and VCB.
19 What will be the performance of the motor if the frequency is reduced.
20 List the types of distribution system used in ship.

PART B

1 How will you check the polarity while connecting shore supply and how to correct it if required?
2 Why shore supply should be connected to ship during dry docking?
3 Draw and explain Main switch board in marine electrical systems
4 Explain dark lamp method of synchronizing two alternators.
5 Explain how timing is preferred in trip system.
6 Explain bright lamp method of synchronizing two alternators.
7 Explain auto start sequence on recovering power to MSB.
8 Explain the working of bilge alarm.
9 A 440V, 5KW, 0.8pf, 3 phase load is supplied as shown in the figure below. Find the short circuit fault current when the fault occurs at the (a) load terminal (b) db (c) main switchboard.



10 Write the procedure for shore power reception on a VLCC.
11 Is ventilation needed in engine room. Justify.
12 Write the procedure for transfer from shore supply to the main diesel generator on a VLCC.
13 Explain the effect of change in supply voltage on torque and speed.
14 Explain radial distribution system.
15 Explain the effect of change in supply frequency on torque and speed.

PART C

1 Explain AC distribution system in onboard ships.
2 Explain shore supply arrangement with basic diagram.
3 Explain the load sharing of generator in detail.
4 Explain the construction and working of vacuum circuit breaker.
5 Explain the importance of using shore supply in ship and write down the procedure to connect shore supply to ship.
6 Explain the construction and working of Air circuit breaker.

UNIT-III

PART A

1 How earthing is done in ship?
2 write the importance of earthing system.
3 Write any two difference between secondary cell and primary cell.
4 List the defects of lead acid batteries.
5 What is the purpose of emergency batteries on board ship?
6 Write the type of charges which can be done in storage batteries.
7 Write any two difference between constant current system and constant voltage system.
8 What are the precautions to be taken against electrical shock and related hazardous?
9 How we can check fully charged battery?
10 Write the equation for determining the charging current in a battery.
11 What is Electrochemical reaction?
12 What is thermal runaway?
13 What do you mean by smart charger?
14 What is single rate charger?
15 why do we require storage battery on board ship
16 What is topping up?
17 Write any four Do's while handling batteries
18 Write any four Don'ts while handling batteries
19 Draw the block diagram of Battery charger
20 What is trickle charging?

PART B

1 Demonstrate the safety precautions related to entering into and working in battery room
2 Explain the types of earthing system.
3 What are storage batteries? Explain.
4 Explain emergency battery circuit.
5 With a neat block diagram explain the operation of Battery charger.
6 Briefly explain the indications of a fully charged cell.
7 What are the electrical characteristics of Lead acid cell?
8 Draw and explain operating principle of smart charger
9 Explain about the discharging action.
10 Explain the battery charger monitoring system with necessary diagram.
11 Explain the types of charging available for Battery charging?
12 What are the main features of Sealed lead-acid batteries?
13 Explain the importance of earthing with an example.
14 What are the characteristics are required for a good primary cell ?
15 Explain the types of transformer in detail.

PART C

1 Explain the operation of charging methods adopted in charging a battery.
2 Explain the working principle of Flooded cell battery
3 What are the safety measures when working with batteries
4 Explain constant current system and constant voltage system of charging.
5 what are the different types of emergeny batteries? Explian the constructional details?
6 Explain the concept of charging with supply from AC source and DC Source

UNIT-IV

PART A

1 Name the faults that occurs in cables.
2 Name the loop test methods used in location of fault.
3 How cables are test periodically?
4 What are the types of Electrical injuries?
5 How to determine cable size?
6 What is Class A cable Insulation?
7 What is Class B cable Insulation?
8 What is Class E cable Insulation?
9 What is Class F cable Insulation?
10 What is Class H cable Insulation?
11 What is the maximum ambient temperature of marine electrical equipment?
12 What is the purpose of sheath on a cable?
13 Explain the properties of silicone rubber as an insulating material.
14 Why copper is good choice for selecting conductors?
15 What are the various classes on insulations?
16 What would be the equivalent shock current levels at 25V and 250 V in a human body.
17 Define positive temperature coefficient of a material.
18 What are the various classes on insulations?
19 What is the use of Flame test?
20 what is the use of bow thrusters?

PART B

1 Explain the Insulation materials used in cables
2 Explain the procedure to test and retain the insulation resistance of a cable.
3 Explain micro and macro shock.
4 Explain the Dos and Don’t when working with electrical equipment.
5 Explain different levels of Electric shock.
6 Explain the Dos and Don’ts while doing battery maintenance
7 Explain the precautions to be carried out when working with portable electrical equipments on board.
8 Explain the properties and use of cable sheath.
9 What are the ways involved in minimizing the electromagnetic interference?
10 Explain the Dos and Don’t when working with electronic equipment.
11 What are the insulating materials generally used in low to medium power AC motor?
12 Explain the terms conductor insulation and insulation resistance
13 What are the practical tips on wiring?
14 Explain any five insulating materials used for insulation.
15 Draw and explain bow thrusters.

PART C

1 Explain the different classes of insulation used in marine cables with suitable diagram.
2 State the FIRST AID to be given, when a person gets an electric shock.
3 Describe in detail the different classes of insulation and its operating temperature .
4 What are the methods adopted for determining the cable sizes?
5 What are the insulating materials generally used in low to medium power AC motor?
6 Explain different type of insulating materials used in marine sector.

UNIT-V

PART A

1 What are called hazardous areas?
2 What is Ex q?
3 Explain the operation of Air operated lamps used in Hazardous zone.How safety is ensured?
4 what is work permit?
5 Why routine test is required?
6 Explain electric shock
7 What are the components of a safety barrier in an intrinsically safe circuit?
8 Which are the other methods of protection of equipment used in hazardous areas?
9 Which type of luminaries are permitted in pump rooms.
10 What is the voltage and current rating of an intrinsically safe circuit?
11 Which type of electrical equipment is allowed inside cargo tanks?
12 Which type of electrical equipment does not require certification and marking?
13 State the factors that contribute to accidents in marine sector?
14 What is meant by live line test?
15 What is Ex d equipment?
16 What is Ex e equipment?
17 What is Ex p equipment?
18 What is Ex i equipment?
19 What is Ex n equipment?
20 What is Ex o equipment?

PART B

1 Describe the precautions before commencing work on electrical equipment.
2 Explain the operation of Air operated lamps used in Hazardous zone .How safety is ensured?
3 Describe the type of fittings for illumination in hazardous zones and explain the maintenance procedure on explosive proof lights.
4 Explain the classification of hazardous areas.
5 Explain Exp .
6 Draw and explain Exd flame paths.
7 Explain Exi(a) and Exi(b).
8 Explain intrinsically safe circuit.
9 Explain Exi and Exn equipments.
10 With the help of a table, list out the type of protection allowed in all hazardous zones.
11 Explain the construction of pulley drive in hazardous area.
12 Explain Exe.
13 Explain the Hazardous zones on board a ship.
14 Explain Exd.
15 State the importance of proper ventilation when using varnishes and paints having solvents.

PART C

1 Describe the type of fittings for illumination in hazardous zones and explain the maintenance procedure on explosive proof lights?
2 Explain the catagories of electrical equipments used in hazardous zones in ship.
3 Explain Explosion test and Flame Proof test.
4 Discuss about pressurized equipment and protection in detail with figures.
5 Explain the importance of work permit with an example.
6 Explain Exi barrier operation.