	Question Bank
Course	**B.E(NA & OE)**
Batch	**10**
Semester	**III**
Subject code	**UBEE308**
subject Name	**PRINCIPLES OF MARINE ELECTRICAL TECHNOLOGY**
PART-A	**Marks: 2**
	UNIT-1
1	What are the two main components of induction motor?
2	Why 3-phase induction motor is self starting?
3	What is the Synchronous Speed of a 6-pole motor supplied at 60 Hz?
4	How is the rotor direction reversed in induction motor?
5	Define Slip for induction motor.
6	Write the expression for percentage slip of 3-phase induction motor.
7	If a 6-pole motor is supplied at 60Hz and runs with a slip of 5%, what is the actual rotor speed?
8	State the stator side speed control methods employed in Induction motor?
9	State the rotor side speed control methods employed in Induction motor?
10	What are the types of starters used to start induction Motor?
11	Which type of starter will not reduce starting current?why?
12	What is the necessity of starter?
13	What is the necessity of Motor Protection?
14	What are the three main types of direct temperature sensors used to measure motor winding temperature?
15	What are the common types of single phase induction motors ?
16	what is the most common cause of induction motor failure?
17	What is starting torque?
18	Why Single phase induction motor is not self starting?
19	Write relation between Torque and power factor in an induction motor.
20	What are the types of 3-phase induction motors?
PART-B	**Marks: 6**
	UNIT-I
1	How does the rotor rotate in 3-phase induction motor?
2	Derive the expression for starting torque of 3-phase induction motor.
3	Derive the condition for maximum starting torque.
4	Derive the expression for running torque of 3-phase induction motor.
5	Derive the condition for maximum running torque.
6	Discuss the relation between torque and power factor of a 3-phase induction motor?
7	Write short notes about soft starter.
8	Which type of 3-phase induction motor has high starting torque? Why?
9	A 3-phase induction motor is wound for 4 poles and is supplied from 50Hz system. Calculate (i) the synchronous speed (ii) the rotor speed when slip is 4% and (iii) rotor frequency when rotor runs at 600rpm.

10	Distinguish squirrel cage type motor and phase wound motor.
11	List the advantages of 3-phase induction motor
12	Classify the types of single phase induction motor.
13	How to make single phase induction motor self starting?
14	Describe the construction and working principle of split phase induction motor.
15	Discuss the releation between torque and power factor.
PART-C	**Marks:10**
	UNIT-1
1	Describe why starters are necessary for starting 3-phase induction motors? Name the different types of starters and explain D.O.L Starter.
2	Describe the construction and working principle of 3-phase induction motor.
3	With the neat diagram explain the working of Star-Delta starter for three phase induction motor.
4	With the neat diagram explain the woring of Auto transformer starter for three phase induction motor.
5	Explain in detail the speed control methods of induction motor.
6	Discuss about various types of single phase induction motor.
PART-A	**Marks: 2**
	UNIT-2
1	What are the two types of rotors used in Alternator?
2	Define voltage regulation.
3	Formulate the EMF equation of an alternator.
4	A three phase A.C generator rated at 500KW, 440V at 0.83 lag.find the full load line current.
5	What are the types of excitation methods employed in Alternator?
6	What factors govern the overall voltage response of a generator to sudden load changes?
7	What is AVR?
8	What precaution must be taken when testing the insulation of generator cables and wiring connected to AVR unit?
9	What are the conditions for parallel operation of generators?
10	What are the methods to identify the correct synchronisation of alternators?
11	What is likely to happen if one of the rotating diodes fails and becomes a open circuit in brushless excitation scheme?
12	What is the function of reverse power relay?
13	Differentiate OCIT and OC relay.
14	What is NPS relay?
15	What is the function of Earth leakage relay?
16	What is the fucntion of UV/OV relay?
17	What is the fucntion of UF/OF relay?
18	What is the function of NER ?

PART-B	**Marks: 6**
	UNIT - 2
1	Describe the construction of alternator.
2	Write short notes about alternator cooling system.
3	What is likely to happen if one of the rotating diodes fails and becomes a (i) open circuit (ii) short circuit in brushless excitation scheme?
4	Describe the AVR function with neat sketch.
5	Describe the Brushless excitation scheme.
6	Describe the static excitation scheme.
7	Discuss the necessity of synchronisation while parallel operation of generators.
8	Write the frequency and speed relation in Alternator.
9	What are the conditions for proper synchronisation of alternators?
10	Obtain the induced emf equation for alternator.
11	Write the function of the following relays in alternator protection: (i) OCIT (ii) OC(INST) (iii) NPS.
12	Write the function of the following relays in alternator protection: (i) Differential relay (ii) EL relay (iii) UV/OV relay.
13	Write the function of the following relays in alternator protection: (i)UF/OF (ii) LO relay (iii) Reverse Power relay.
14	How will the failure of water cooling system on a large generator affect the operation of generator?
15	Write short notes on Reverse Power relay function in generator protection .
PART-C	**Marks : 10**
	UNIT-2
1	Explain the construction and working principle of alternator.
2	With the neat diagram explain brushless excitation scheme for alternator.
3	With the neat diagram explain three phase compound excitation scheme for alternator.
4	Explain the synchronizing method for parallel operation of generators
5	Eplain the alternator protection scheme.
PART-A	**Marks: 2**
	UNIT-3
1	What are the types of Neutral earthing systems in ship?
2	Define insulated neutral system
3	Define earthed neutral system
4	Which type of neutral earthing is preffered in LV ship?
5	How earthing is being done in HV ship?
6	What is the purpose of Neutral Earthing Resistor in HV ship?
7	Define conductor.
8	Define insulation.
9	Define short circuit fault.
10	Define open circuit fault.

11	Define earth fault.
12	Which instrument is used to measure Insulation Resistance?
13	What are the types of Marine Electrical Switchboards?
14	List out the insulation materials
15	What should be the range of insulation resistance?
16	What are the two main types of rechargeable batteries?
17	What is the nominal voltage rating of Ships' batteries?
18	What is the typical voltage and power ratings of emergency generator?
19	How the power rating of an emergency generator is determined?
20	List few emergency loads
PART-B	**Marks: 6**
	UNIT - 3
1	Discuss about various types of neutral earthing systems in onboard ship.
2	Define the following: i) Open circuit fault ii) Earth fault iii) short circuit fault
3	Write short notes on insulation resistance measurement.
4	Discuss about Main switch board used in onboard ship.
5	What is the necessity of Emergency generator in ship?
6	Discuss about the commonly used batteries in ship.
7	Define the following: i) Conductor (ii) Insulation (iii) Insulation Resistance
8	Discuss about Insulation Resistance.
9	Write shorts on emergency supply system in ship.
10	Why insulated neutral earthing is preffered in LV ship? Explain.
PART-C	**Marks : 10**
	UNIT-3
1	Explain about marine electrical switch boards.
2	What is the significance of earth faults in shipboard electrical system?
3	Explain the operation and maintenance of commonly used batteries in ship.
4	Explain in detail about the operation of Emergency generator
5	Explain the insulation testing of an 3phase induction motor.
6	Explain about working of megger.
PART-A	**Marks: 2**
	UNIT-4
1	State the principle of DC generators.
2	Write the emf equation of dc machine.
3	What are the major parts of a dc generator.
4	What are the conditions for parallel operation of dc generators.
5	State fleming's left hand rule.
6	Write down the speed equation of a dc motor
7	List the different methods of speed control of DC shunt motor.
8	How does back emf in a DC motor makes the motor self regulating?
9	Why is a DC series motor used to start heavy loads.
10	Write down the significance of back emf in a dc motor.
11	Mention speed control methods of dc shunt motor.
12	Mention speed control methods of dc series motor.
13	Write the five specially designed navigation lights arrangement.
14	State the applications of dc series motor.
15	State the applications of dc shunt motor.

PART-B	**Marks: 6**
	UNIT - 4
1	Draw the performance characteristics of different types of dc generators.
2	Draw the circuit diagram for separately excited generators & self excited series generator
3	Draw and explain the load characteristics of separately excited generators.
4	Why series motor should not start with noload condition?explain?
5	Explain about flux control method in DC shunt motor and advantage, disadvantage
6	Explain the performance characteristic of DC shunt motor.
7	Derive expression for the speed of a DC motor and suggest the parameters to be varied for speed control
8	Sketch Speed-Torque characteristics of a dc series motor & explain
9	Sketch Speed-Torque characteristics of a dc shunt motor and explain
10	Write short notes on incandescent lamps used in ship.
11	Discuss about Discharge lamps used in ship.
PART-C	**Marks:10**
	UNIT-4
1	Explain the construction and working principle of D.C. generator with neat diagram.
2	Explain briefly about the separately and self excited DC generators.?
3	What are the methods of speed control of a DC series motor and briefly explain them with the help of neat diagram
4	Derive the torque equation & speed equation of D.C motor.
5	Explain about arrangement of navigation lights in ship with neat sketch.
6	Explain about various lighting systems used in ship.
PART-A	**Marks: 2**
	UNIT-5
1	Classify the general electrical maintenance.
2	What is Break down maintenance?
3	What is planned maintenance?
4	What is condition monitoring?
5	List the few general fault finding techniques
6	What is fuse?
7	List the various safety regulation issuing bodies.
8	What is thermocouple?
9	What is thermistor?
10	What is the necessity of fuse?
11	List the various types of fuses.
12	List the two disadvantages in breakdown maintenance.
13	List the two advantages of planned maintenance.
14	What is HRC fuse?
15	Write the disadvantage of fuse.

PART-B	**Marks: 6**
	UNIT-5
1	Describe i) Break down maintenance ii) planned maintenance
2	List out all the fault finding techniques
3	What are the disadvantages in breakdown maintenance.
4	What are the advantages of planned maintenance.
5	Discuss about RTD.
6	Compare RTD with Thermistor.
7	List few DO's when working with electrical equipment.
8	List few DO NOT's when working with electrical equipment.
9	Discuss about anyone of pressure measurement system.
10	Discuss about Thermocouple.
PART-C	**Marks: 10**
	UNIT-5
1	Explain about general electrical maintenance of onboard ship.
2	Explain about safe electrical practice in ship.
3	Explain about temperature measurement system.
4	Explain about pressure measurement system.
5	Explain about speed measurement system.
6	Explain about torque measurement system.