Course	B.E-Marine Engineering
Batch	B.E- ME-15
Semester	V
Subject Code	UAEE502
Subject Name	**POWER ELECTRONICS, HIGH VOLTAGE & ELECTRIC PROPULSION**

Part A

UNIT-I

1. What is meant by power electronics?
2. Name the types of power transistor.
3. Why IGBT is a voltage-controlled device?
4. Why Power BJT is a current controlled device?
5. What are the different types of power MOSFET?
6. Define circuit turn off time.
7. Why IGBT is very popular now a days?
8. What are the voltage controlled devices available in power electronics?
9. What are the current controlled devices available in power electronics?
10. What are the types of commutation?
11. What is meant by commutation?
12. What is meant by rise time?
13. What is meant by delay time?
14. What is meant by spread time?
15. Define latching current.
16. What do you understand from SCR rating?
17. What is an enhancement mode of MOSFET?
18. What is depletion mode of MOSFET?
19. Name the applications of IGBT.
20. Define holding current.

UNIT-II

21. What is meant by phase controlled rectifier?
22. Name the devices used for phase controlled rectification.
23. What is meant by delay angle?
24. What are the different types of PWM control?
25. What are the advantages of freewheeling diodes in a controlled rectifier?
26. What are the different types of converter ?
27. What is a dual converter?
28. Write down the applications of thyristor.
29. What is meant by inverter?
30. What are the main classification of inverter?
31. Give two advantages of CSI.
32. Give two advantages of VSI.
33. What are the two types of cyclo-converters?
34. What are the applications of a CSI?

35 What are the applications of a VSI?
36 What is a dc drive?
37 Mention the methods of obtaining dc outputs.
38 What is a power factor?
39 What is an alternating current drive?
40 What is a cycloconverter?

UNIT-III

41 What is meant by controlled rectification?
42 What is inversion?
43 Mention the application of controlled rectification technique in marine engineering .
44 How the speed control is achieved in a d.c shunt motor ?
45 Which parameter causes torque control in a d.c shunt motor?
46 State the advantages of electric propulsion system.
47 Name the converter types.
48 What is the firing angle range for rectifier and inverter?
49 Write the expression for output voltage of single phase inverter.
50 At sea the shaft speed commands are repeated from where?
51 What is the use of joy stick in Bridge and ECR?
52 What is meant by podded propulsion system?
53 What is meant by integrated electric propulsion?
54 Which drive has better maneuvering capabilities?
55 What is meant by commutation in electric propulsion?
56 What is meant by excitation converter?
57 State the advantage of pulse mode operation?
58 How the speed control of a.c motor can be varied?
59 Which drive is used for controlling the speed of a.c motor ? why?
60 Which drive is used for controlling the speed of d.c motor ? why?

UNIT-IV

61 What is meant by CPP?
62 What is meant by FPP?
63 What do you understand by integrated electric propulsion?
64 Mention the salient feature of diesel electric Propulsion
65 which drive is used for improving maneuvering capabilities ?
66 What is meant by pulse mode operation in electric drive?
67 Which parameter is used for controlling Propulsion speed in electric propulsion system?
68 What is SDG in marine engineering?
69 Expand SFOC.
70 What is meant by passive filter?
71 What is meant by active filter?
72 What is meant by hybrid filter?
73 What is harmonics?
74 Name the causes for harmonics?

75 What is meant by Synchronous condenser ?
76 What is meant by linear load ?Give an example.
77 What is meant by Non-linear load ?Give an example?
78 Expand THD?
79 List the advantages of electric propulsion.
80 What is shaft generator?

UNIT-V

81 Define HV in marine engineering?
82 Define LV in marine engineering?
83 What is meant by Circuit breaker?
84 What is a relay in electrical protection?
85 Name some common faults which occur on board ship?
86 What is meant by protective devices on board ship?
87 What is IR Value? State why it is important?
88 Name some HV insulating materials in transformer winding.
89 What is EPTW in electrical aspect?
90 Name the authority to issue EPTW.
91 What is meant by earthing?
92 Why earthing is needed on board?
93 State different types of earthig.
94 What is meant by Earthing-down?
95 What is meant by Sanction to- Test safety?
96 How much minimum current will create fatal ?
97 Which mechanism is used for operating the moving contact ?
98 What is meant by charging motor in HV side?
99 What are the types of circuit breakers?
100 What is Vacuum circuits breaker?

PART B

UNIT-I

1 Compare Power MOSFET with BJT.
2 What are the types of triggering methods available for SCR?
3 Explain the two transistor model of SCR .
4 Explain the operation of MOSFET .
5 Distinguish between SCR and TRIAC.
6 How SCR differs from diode rectifier?
7 Explain the types of commutation.
8 Explain the operation of snubber circuit.
9 What are the various modes of Triac?Which modes are more sensitive?
10 Explain the static characteristics of SCR.
11 Compare Power MOSFET with IGBT.
12 Draw the input and output characteristics of power BJT.
13 Explain IGBTand its characteristics.
14 With a simple sketch ,explain the dv/dt protection of SCR.
15 Briefly discuss the dynamic characteristics of SCR.

UNIT II

16 Explain the principle of phase control.
17 Mention some of the applications of controlled rectifier.
18 What are the advantages of six-pulse converter?
19 What is the difference between half controlled & fully controlled Rectifier?
20 Explain about half controlled rectifier.
21 Explain about Full controlled rectifier.
22 Describe about freewheeling diode.
23 Briefly discuss the operation of dual converter.
24 What are the applications of an inverter?
25 Explain the operation of single phase half bridge inverter.
26 Brief about PWM control.
27 What are the advantages of PWM control?
28 What are the disadvantages of the harmonics present in the inverter system?
29 Explain the operation of single phase full bridge inverter.
30 Compare CSI and VSI.

UNIT III

31 What are the advantages of azimuth pod drive?
32 Briefly discuss about synchro converter.
33 Write short notes on azimuth pod drive.
34 Write short notes on cyclo converter.
35 Brief about controlled rectification and inversion in marine engineering.
36 Name the different types of converters employed in marine engineering.
37 Explain any one commutation circuit used in converter.
38 With a simple sketch ,explain line commutation in converter.
39 Explain the speed control methods in d.c shunt motor.
40 What are the methods used for controlling speed in d.c series motor?
41 Briefly discuss about inverter types and its applications.
42 State advantages of podded drive.
43 State the advantages of electric propulsion.
44 State the disadvantages of conventional propulsion.
45 State the advantages of conventional propulsion.

UNIT IV

46 Why electric propulsion system is preferred now a days?
47 Name the three modes of SDG system.
48 What are the advantages of SDG?
49 With a simple sketch, brief about passive filter.
50 With a simple sketch, brief about active filter.
51 With a simple sketch ,brief about hybrid filter.
52 What are the effects of harmonics in power system?
53 Describe about THD.
54 What is harmonics ? How it can be eliminated?
55 Describe the passive harmonic conditioner in detail.
56 Describe the active harmonic conditioner in detail.

57 Describe the hybrid harmonic conditioner in detail.
58 What is meant by 3rd Harmonic?
59 What is meant by 7th Harmonic?
60 Name the harmonics measuring devices.

UNIT V

61 Dicuss the merits of HV in Marine engineering?
62 Discuss the demerits of HV in Marine engineering?
63 What are the merits of Vacuum circuit breaker?
64 State the importance of EPTW on board ship?
65 What is section-3 in EPTW?
66 Describe about Bus bar earthing.
67 Describe about circuit earthing.
68 Describe about earthing-down methods.
69 Why Sanction to- Test safety is important in on board?
70 Describe the function of charging motor in HV side
71 Briefly discuss about different types of earthig.
72 Explain the operation of Vacuum circuit breaker.
73 Name some common faults occur on board ship and mention the protective devices used.
74 Explain the operation of ACB.
75 Explain the operation of SF_6.

PART C

UNIT I

1 Explain the constructions and static characteristics of power MOSFETs.
2 Explain the various types of triggering methods of SCR.
3 With neat sketch,explain the construction and operation of SCR.
4 Explain with neat diagrams, the four modes of operation of a TRIAC.
5 With neat sketches,explain the dynamic characteristics of SCR.
6 Explain the constructions and characteristics of power BJTs.

UNIT II

7 Explain the operation of 3phase full converter with resistive load.
8 Describe about direct current drives and alternating current drives with relevant diagrams.
9 Explain the slip energy recovery scheme with suitable diagram.
10 Explain the operation of single phase cyclo converter with suitable diagram.
11 Explain the operation of load commutated inverter with suitable diagram.
12 Explain the operation of single phase auto sequentially commutated inverter with relevant diagrams.

UNIT III

13 Describe the electric propulsion systems operation neatly with a diagram.
14 Explain the operation of 180 degree mode operation of three phase inverter.
15 Explain the operation of single phase full bridge and half bridge inverter.
16 Explain the HV propulsion operation with its main propulsion components.
17 Explain the different types of speed control for d.c motor and draw its

characteristics.

18 Explain diesel propulsion system and compare with electric propulsion system.

UNIT IV

19 Explain different types of shaft generators used on board.

20 Explain the a.c drive with controllable pitch propeller system.

21 With suitable diagrams ,explain the three types of filter.

22 Explain harmonics generation and its control on board a ship.

23 i)List the advantages and disadvantages of electric propulsion system . (5)
ii)How to eliminate harmonics in ship drive system? (5)

24 Describe the salient features of diesel propulsion systemand compare it with electric propulsion system.

UNIT V

25 Describe the operating modes of SDG with a diagram

26 Describe layout of high voltage system on board the ship with a diagram.

27 What is an arc quenching medium in vacuum circuit breaker? Compare it with ACB and SF6.

28 With a neat sketch explain the operation of Vacuum circuit breaker.

29 Describe in detail about EPTW?

30 What are DO's and DON'ts in electrical ship system?