CourseB.E-Marine EngineeringBatchB.E- ME-15

B.E- MI

Semester VI

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 Name the applications of IGBT.
- 7 Define holding current.
- 8 What are the voltage controlled devices available in power electronics?
- 9 What are the current controlled devices available in power electronics?
- 10 Define latching current.
- 11 What is meant by commutation?
- 12 What is meant by rise time?
- 13 What is meant by delay time?

UNIT-II

1 What is meant by phase controlled rectifier?

2 Name the devices used for phase controlled rectification.

3 What is meant by delay angle?

4 What are the different types of converter ?

5 What is a dual converter?

6 What is meant by inverter?

7 What are the main classification of inverter?

8 Give two advantages of CSI.

9 What are the two types of cyclo-converters?

10 What are the applications of a CSI?

11 What is an alternating current drive?

12 What is a cycloconverter?

13 what is dc drive?

UNIT-III

1 What is meant by controlled rectification?

2 What is inversion?

3 How the speed control is achieved in a d.c shunt motor?

4 State the advantages of electric propulsion system.

5 Name the converter types.

6 Write the expression for output voltage of single phase inverter.

7 At sea the shaft speed commands are repeated from where?

8 What is meant by podded propulsion system?

9 What is meant by integrated electric propulsion?

10 What is meant by commutation in electric propulsion?

11 State the advantage of pulse mode operation?

12 Which drive is used for controlling the speed of a.c motor ? why?

13 Which drive is used for controlling the speed of d.c motor ? why?

UNIT-IV

1 What is meant by CPP?

2 What is meant by FPP?

3 Mention the salient feature of diesel electric Propulsion

4 What is meant by passive filter?

5 What is meant by active filter?

6 What is meant by hybrid filter?

7 What is harmonics?

8 Name the causes for harmonics?

9 What is meant by Synchronous condenser?

10 What is meant by Non-linear load ?Give an example?

71 Expand THD?

11 List the advantages of electric propulsion.

13 What is shaft generator?

UNIT-V

1 Define HV in marine engineering?

2 What is meant by Circuit breaker?

3 What is meant by protective devices on board ship?

4 What is IR Value? State why it is important?

5 What is EPTW in electrical aspect?
6 Name the authority to issue EPTW.
7 What is meant by earthing?
8 Why earthing is needed on board?
9 State different types of earthig.
10 What is meant by Sanction to- Test safety?
11 How much minimum current will create fatal ?
12 What are the types of circuit breakers?
13 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 Distinguish between SCR and TRIAC.

4 How SCR differs from diode rectifier?

5 Explain the types of commutation.

6 What are the various modes of Triac?Which modes are more sensitive?

7 Compare Power MOSFET with IGBT.

8 With a simple sketch ,explain the dv/dt protection of SCR.

UNIT II

1 Explain the principle of phase control.

2 Mention some of the applications of controlled rectifier.

3 What are the advantages of six-pulse converter?

4 Explain about Full controlled rectifier.

⁵ Briefly discuss the operation of dual converter.

6 What are the applications of an inverter?

7 Explain the operation of single phase half bridge inverter.

8 Compare CSI and VSI.

UNIT III

1 What are the advantages of azimuth pod drive?

2 Write short notes on cyclo converter.

³ Name the different types of converters employed in marine engineering.

4 With a simple sketch ,explain line commutation in converter.

5 Explain the speed control methods in d.c shunt motor.

6 What are the methods used for controlling speed in d.c series motor?

7 Briefly discuss about inverter types and its applications.

8 State the advantages of electric propulsion.

UNIT IV

1 Describe about THD.

2 What is harmonics ? How it can be eliminated?

3 What are the advantages of SDG?

4 With a simple sketch, brief about passive filter.

5 With a simple sketch, brief about active filter.

6 With a simple sketch ,brief about hybrid filter.

7 What is meant by 3rd Harmonic?

8 Name the harmonics measuring devices.

UNIT V

1 Dicuss the merits of HV in Marine engineering?

2 Discuss the demerits of HV in Marine engineering?

3 What are the merits of Vacuum circuit breaker?

4 State the importance of EPTW on board ship?

5 What is section-3 in EPTW?

6 Briefly discuss about different types of earthig.

7 Explain the operation of Vacuum circuit breaker.

8 Name some common faults occur on board ship and mention the protective devices used.

PART C UNIT I

1 Explain the constructions and characteristics of power BJTs.

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.

UNIT II

1 Explain the operation of 3phase full converter with resistive load.

2 Describe about direct current drives and alternating current drives with relevant diagrams.

3 Explain the slip energy recovery scheme with suitable diagram.

4 Explain the operation of single phase cyclo converter with suitable diagram.

UNIT III

1 Describe the electric propulsion systems operation neatly with a diagram.

2 Explain the operation of 180 degree mode operation of three phase inverter.

3 Explain the operation of single phase full bridge and half bridge inverter.

4 Explain the different types of speed control for d.c motor and draw its characteristics.

UNIT IV

1 Explain different types of shaft generators used on board.

² Describe the salient features of diesel propulsion systemand compare it with electric propulsion system.

³ With suitable diagrams ,explain the three types of filter.

i)List the advantages and disadvantages of electric

propulsion system.

(5)

ii)How to eliminate harmonics in ship drive system?

4 (5)

UNIT V

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

² What are DO's and DON'ts in electrical ship system?

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

4 Describe in detail about EPTW?