ELECTRICAL AND ELECTRONICS ENGINEERING

QUESTION BANK

Course Title : POWER ELECTRONICS

Course Code : 23EE501

Regulation : NR23

Course Objectives

- To Design/develop suitable power converter for efficient control or conversion of power in drive applications
- To Design / develop suitable power converter for efficient transmission and utilization of power in power system applications.

Course Outcomes (CO's)

CO1 Apply the basic operation and characteristics of various power semiconductor devices and intelligent power module.

CO2 Design AC/DC rectifier circuit CO3 Evaluate chopper circuits

CO4 Examine three phase inverter circuits CO5 Create AC voltage controller circuits

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UNIT–I

Power Switching Devices

S.No		Questions	BT	CO	PO
Part – A (Short Answer Questions)					
1		Define latching current of SCR.	L1	CO1	PO1
2		What are the different methods to turn on the thyristor?	L1	CO1	PO1
3		What are the parameters involved in switching loss of power device?	L1	CO1	PO1
4		Why are IGBT becoming popular in their application to controlled converters?	L1	CO1	PO1
5		Write down the applications of IGBT?	L1	CO1	PO1
6		What are the advantages of MOSFET?	L1	CO1	PO1
7		Define the term pinch off voltage of MOSFET	L1	CO1	PO1
8		Define latching and holding current of SCR.	L1	CO1	PO1
9		What is meant by commutation and write down its types.	L1	CO1	PO1
10		Compare MOSFET and BJT?	L1	CO1	PO1
Part – B (Long Answer Questions)					
11	a)	Describe the current commutation technique to turn off the SCR with neat sketch and waveforms.	L2	CO1	PO1, PO2
	b)	Explain the concept of series and parallel connections of SCRs	L2	CO1	PO1, PO2
12	a)	Explain the operation of IGBT with the help of neat structural	L1	CO1	PO1

		diagram and suitable wave forms.			
	b)	Explain the operation of two transistor analogy	L2	CO1	PO1, PO2, PO3
13	a)	With neat sketch explain the turn on and turn off characteristic of SCR**.**	L2	CO1	PO1, PO2, PO3
	b)	Discuss in detail the static and switching characteristic of power IGBT.	L2	CO1	PO1, PO2
14	a)	Explain the switching performance of BJT with relevant waveforms indicating clearly the turn-on, turn-off times and their components	L2	CO1	PO1, PO2
	b)	Explain the switching characteristics of power IGBT with neat circuit diagram and waveforms.	L2	CO1	PO1
15	a)	Explain the switching performance of MOSFET with relevant waveforms indicating clearly the turn-on, turn-off times and their components	L2	CO1	PO1, PO2
	b)	Compare and contrast the performance characteristics of IGBT and MOSFET	L1	CO1	PO1
16	a)	Explain the switching performance of SCR with relevant waveforms indicating clearly the turn-on, turn-off times and their components.	L2	CO1	PO1, PO2, PO3
	b)	Draw the basic structure of an IGBT and explain its operation	L2	CO1	PO1