BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS:M.Tech **SEMESTER : 2nd**
BRANCH:ALL (OE) **SESSION : SP/22**

SUBJECT: EE589 Power Semiconductor Devices
TIME: 2 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

1.	(a)	List four unidirectional controllable power devices. Draw their appropriate symbols.	[5]
CO1	(b)	Establish mathematical relationship between reverse recovery time and stored reverse recovery charges of a power diode.	[5]
2	(a)	Draw steady state characteristics of a Thyristor. Show different regions of operation.	[5]
CO2	(b)	Draw circuit diagram of Class A and Class B method of commutation.	[5]
3	(a)	Differentiate between Power MOSFET and IGBT.	[5]
CO3	(b)	Draw dynamic switching characteristics of Drain to Source Voltage (V_{DS}) and Drain to Source (I_{DS}) Current with respect gate to source voltage (V_{GS}) if the PMOSFET is feeding a Resistor R_{LOAD} from DC Voltage supply of Vs.	[5]
4.	(a)	Draw cross-sectional diagram symmetrical and asymmetrical IGBT and label different layers.	[5]
CO4	(b)	What are different applications of IGBT?	[5]
5	(a)	Explain operating principle of TRIAC.	[5]
CO5	(b)	Discuss thermal dissipation and heat sink design for any semiconductor device?	[5]

04/05/2022 E