

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION MO/2024)

CLASS: BTECH
BRANCH: EEE

SEMESTER : VII
SESSION : MO/2024

SUBJECT: EE507 ADVANCED POWER ELECTRONICS

TIME: 02 Hours

FULL MARKS: 25

INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates
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Q.1(a)	Explain the turn on and turn off switching characteristics of an IGBT ?	[2]	CO CO1	BL BL2
Q.1(b)	With proper justification explain the gate charge characteristics of an IGBT?	[3]	CO1	BL2&B L3
Q.2(a)	How totem pole arrangement is important for an optocoupler?	[2]	CO1&CO2	BL1
Q.2(b)	Justify the role of the gate driver circuit in Power MOSFET with proper waveforms?	[3]	CO1&CO2	BL5
Q.3(a)	With equivalent circuit diagram explain the 180° conduction of a VSI?	[2]	CO2	BL3
Q.3(b)	List the factors affecting the design for thermal modelling of a power device? Explain the relation between time constant ' τ ' and thermal resistance ' R_θ '?	[3]	CO2	BL2&B L4
Q.4(a)	Compare the working of an isolated half bridge converter to an isolated full bridge converter?	[2]	CO3	BL5
Q.4(b)	Elaborate the modes of operation of an isolated flyback converter with proper circuit diagram and waveforms?	[3]	CO2&CO4	BL6
Q.5(a)	Compare the working of an isolated forward converter to an isolated push pull converter?	[2]	CO3	BL5
Q.5(b)	Elaborate the modes of operation of an isolated forward converter with proper circuit diagram and waveforms?	[3]	CO2&CO4	BL6

::::::18/09/2024::::::M