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

CLASS: BTECH **SEMESTER : VII**
BRANCH: EEE **SESSION : MO/2024**

SUBJECT: EE507 ADVANCED POWER ELECTRONICS

TIME: 3 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.

			CO	BL
Q.1(a)	Explain the working of the gate driver circuit in IGBT with proper waveforms?	[5]	CO1&CO2	BL2
Q.1(b)	Justify the role of totem pole arrangement in a gate driver circuit? How the need of floating supply is established in a gate driver circuit?	[5]	CO1&CO2	BL1&B5
Q.2(a)	With proper circuit diagram and waveforms explain the working of an isolated push-pull converter? Identify the short comings of push-pull converter over isolated cuk converter?	[5]	CO2&CO3	BL3
Q.2(b)	Compare the working of an isolated forward converter to an isolated flyback converter?	[5]	CO3	BL4
Q.3(a)	Illustrate the significance of third harmonic injection in sine PWM? Derive the conditions required for it.	[5]	CO3&CO4	BL2
Q.3(b)	Design a single phase asymmetric 9-level CHB converter voltage with two H-bridges at 1:3 ratio of DC link voltage. Examine the switching states and output waveforms for it.	[5]	CO4&CO5	BL4& BL6
Q.4(a)	Compare the working of Unipolar and Bipolar PWM switching in a single phase VSI? List different modulation strategies in a PWM.	[5]	CO2&CO3	BL4
Q.4(b)	Design a ZCS resonant buck converter and evaluate inductor current, capacitor voltage and switch voltages assuming different modes of operation.	[5]	C04	BL5&BL6
Q.5(a)	Define Resonant Converters? With proper justification explain the conditions of non-overlapping and overlapping waveforms in series resonant inverter with bidirectional switches.	[5]	CO2&CO3	BL1&BL3
Q.5(b)	With the help of pin diagram explain the working of UC 3843 ?	[5]	CO2	BL3

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