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

CLASS: BTECH **SEMESTER : VI**
BRANCH: ECE **SESSION : SP/2024**

SUBJECT: EC375 INDUSTRIAL 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 construction and working of DIAC and TRIAC. Discuss the applications of DIAC and TRIAC.	[5]	1	2
Q.1(b)	Sketch UJT triggering circuit for SCR and demonstrate its working.	[5]	1	3
Q.2(a)	Sketch single phase fully controlled bridge rectifier circuit and waveforms for R-L load. Derive the expression for the average load voltage. Why is flywheel diode used across the R-L load?	[5]	2	3
Q.2(b)	Sketch 3 phase full wave-controlled rectifier circuit and waveforms for resistive load. Derive the expression for the average load voltage. What should be the minimum firing angle of the SCRs?	[5]	2	3
Q.3(a)	Compare natural commutation and forced commutation in SCR. Explain the need of forced commutation of SCR.	[5]	3	4
Q.3(b)	List various forced commutation techniques used for turning off a SCR. Sketch Class B commutation circuit and related waveforms and demonstrate its working.	[5]	3	3
Q.4(a)	Compare VSI and CSI and explain the working of McMurray Inverter Circuit.	[5]	4	4
Q.4(b)	Sketch a step-up chopper circuit and explain its working. Derive the expression for its average output voltage.	[5]	4	3
Q.5(a)	Schematize a single phase 2 quadrant DC drive circuit and explain its working.	[5]	5	2
Q.5(b)	Write short notes nonmotor industrial applications of power electronics like i) Resistance welding ii) Induction Heating	[5]	5	2

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