BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION SP/2025)

CLASS: BTECH **SEMESTER : VI**
BRANCH: ECE **SESSION : SP/2025**

SUBJECT: EC375 INDUSTRIAL ELECTRONICS

TIME: 02 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*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

			CO	BL
Q.1(a)	Explain the different operating modes of an SCR with the help of V-I characteristics.	[5]	CO1	2
Q.1(b)	Compare R and RC triggering circuits for SCR and explain one common problem with these circuits. How is this problem solved with UJT and 555 timer-based triggering circuits?	[5]	CO1	3
Q.2(a)	Sketch the circuit diagram for single phase fully controlled bridge rectifier circuits and its relevant waveforms with resistive load. Derive the expression for average voltage and RMS voltage across the load.	[5]	CO2	2
Q.2(b)	Explain the operation of three phase full wave-controlled rectifier with resistive (R), loads. Provide necessary waveforms for various currents and voltages of the converter. Derive the expression for average load voltage. Why does the minimum firing angle of the SCR has to be greater than 60^{o} in this circuit?	[5]	CO2	2
Q.3(a)	Compare natural commutation and forced commutation in SCR circuit. What are different types of forced commutation circuit?	[5]	CO3	3
Q.3(b)	Explain the operation of the Class -C forced commutation circuit. Provide the necessary circuit and waveform diagram for the same.	[5]	CO3	2
Q.4(a)	Explain Mc-Murray Half bridge Inverter circuit operation by giving suitable waveforms	[5]	CO4	2
Q.4(b)	What is step up chopper circuit? Sketch the circuit and necessary waveforms then derive the expression for output voltage.	[5]	CO4	2
Q.5(a)	List the various types of DC motors. Explain DC shunt motor drive circuit.	[5]	CO5	2
Q.5(b)	Write short notes on i) Induction Heating ii) Resistance Welding	[5]	CO5	2

::::::25/04/2025::::::M