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

CLASS: B.TECH **SEMESTER: VII**
BRANCH: ECE **SESSION: MO/2022**

SUBJECT: EC401 INDUSTRIAL ELECTRONICS

TIME: 2 HOURS **FULL MARKS: 25**

INSTRUCTIONS:
1. The total marks of the questions are 25.
2. Candidates attempt for all 25 marks.
3. Before attempting the question paper, be sure that you have got the correct question paper.
4. The missing data, if any, may be assumed suitably.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

				CO	BL
Q1	(a)	Draw a two-transistor representation of the SCR and describe the condition for its conduction.	[2]	01	01
Q1	(b)	Explain the V-I characteristics and application of UJT.	[3]	01	02
Q2	(a)	Appraise the role of the Flywheel diode.	[2]	02	05
Q2	(b)	Explain the working principle of a Single-phase full-wave (bridge type) rectifier circuit with RL load. Also, elaborate on the rectifying mode as well as inversion mode.	[3]	02	02
Q3	(a)	Justify why Germanium is not used to make SCR.	[2]	01	05
Q3	(b)	For an SCR, the gate cathode characteristic is given by $v_g = 1 + 10I_g$. Gate source voltage is a rectangular pulse of 15 V with 20 μs duration. For an average Gate power dissipation of 0.3 watts and a peak gate drive power of 5 watts, compute a.) The resistance is to be connected in series with the SCR gate. b.) The duty cycle of the triggering pulse.	[3]	02	03
Q4	(a)	Define commutation and its various types.	[2]	03	01
Q4	(b)	What is a snubber circuit? Explain the way to calculate the various parameters of its.	[3]	01	03
Q5	(a)	Distinguish between Controlled rectification/rectifier and uncontrolled rectification/rectifier.	[2]	02	04
Q5	(b)	Explain the working principle of three phases half-wave rectifier circuit. Obtain average dc voltage and RMS voltage for resistive load.	[3]	02	03

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