Course Code-BEC405B

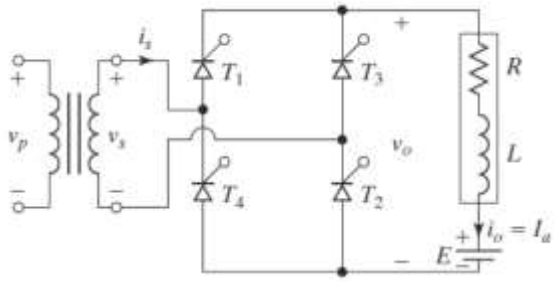
Model Question Paper-I/II with effect from 2022 (CBCS Scheme)

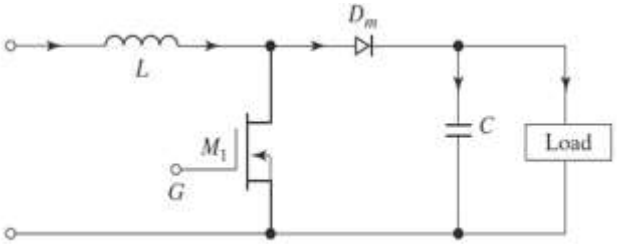
USN										

Fourth Semester BE Degree Examination
Course Title – Industrial Electronics

TIME: 03 Hours **Max. Marks: 100**

Note: Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

Q. No.		Module - 1	M	L	C
Q1	a	Classify and briefly explain different types of power diodes.	6	L1	CO1
	b	With neat block diagram explain the construction details of n-channel depletion type of MOSFET.	7	L2	CO1
	c	With neat diagram discuss the output characteristics of enhancement-type MOSFET.	7	L2	CO1
OR					
Q2	a	With neat cross sectional diagram explain the construction of COOLMOS.	6	L1	CO1
	b	With diagram explain the output and transfer characteristics of JFET.	7	L2	CO1
	c	With diagram explain the simplified structure of a 4H-SiC p-channel IGBT.	7	L2	CO1
Module - 2					
Q3	a	With neat diagram explain the different regions of VI characteristics of silicon controlled SCR.	7	L1	CO2
	b	With neat circuit diagram and waveform explain the working of single phase full converter with RL load.	7	L1	CO2
	c	The single-phase full converter of Figure Q3(C) has a RL load having L = 6.5 mH, R = 0.5 Ω, and E = 10 V. The input voltage is Vs = 120 V at (rms) 60 Hz. Determine (a) the load current I_{Lo} at ωt = α = 60°, (b) the average thyristor current I_A, (c) the rms thyristor current I_R.  Fig Q3(c).	6	L2	CO2
OR					
Q4	a	With neat circuit diagram and waveforms explain the buck regulator.	7	L1	CO2
	b	With neat circuit diagram and waveform explain the buck-boost	7	L1	CO2

		regulator.			
	c	A boost regulator in Figure Q4c has an input voltage of Vs = 5 V. The average output voltage V_a = 15 V and the average load current I_a = 0.5 A. The switching frequency is 25 kHz. If L = 150 µH and C = 220 µF, determine (a) the duty cycle, (b) the ripple current of inductor, (c) the peak current of inductor.  Fig Q4c	6	L2	CO2
Module - 03					
Q5	a	With neat diagram and waveforms explain the operation of single phase bridge inverter.	10	L2	CO3
	b	Explain the operation of 3-phase bridge inverter for 180^o conduction with neat circuit diagram and waveform.	10	L2	CO3
OR					
Q6	a	Explain the operation of Single phase full wave controller with resistive load with neat circuit diagram and waveforms.	10	L2	CO3
	b	Explain the operation of Single phase full wave controller with inductive load with neat circuit diagram and waveforms.	10	L2	CO3
Module - 04					
Q7	a	Explain the principle of Capacitive sensing in MEMs devices.	6	L1	CO4
	b	Explain the principle of Piezoelectric sensing in MEMs devices.	7	L1	CO4
	c	Explain the electrostatic actuation in MEMs devices.	7	L1	CO4
OR					
Q8	a	Briefly discuss radio frequency distributed MEMS phase shifters.	6	L1	CO4
	b	Briefly discuss industrial applications of MEMs.	7	L1	CO4
	c	Briefly discuss biomedical applications of MEMs.	7	L1	CO4
Module - 05					
Q9	a	Discuss the importance of cooling of electrical devices and some of the methods used.	7	L1	CO5
	b	Explain the electrical equivalent thermal model and its mathematical equivalent circuit.	7	L2	CO5
	c	Discuss the importance of Snubber circuits. List its various types.	6	L1	CO5
OR					
Q10	a	Explain voltage protection by Selenium Diodes and Metal-oxide Varistors.	7	L2	CO5
	b	List the requirements to be satisfied while selecting the fuse for current protection.	6	L1	CO5
	c	List the sources of EMI and methods of minimizing EMI generation.	7	L2	CO5