Reg.No. _____

Karunya UNIVERSITY

(Karunya Institute of Technology & Sciences)
(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

End Semester Examination – Nov/Dec – 2016

Code : 14EE2010 **Semester : 2016-17 ODD**
Sub. Name : P0wer Electronics **Duration : 3hrs**
Max. marks : 100

ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)

Q. No.	Sub Div.	Questions	Course Outcome	Marks
1.	a.	Draw and elucidate the reverse recovery characteristics of a power diode.	CO1	**10**
	b.	Compare Power MOSFET and Power BJT.	CO1	**5**
	c.	Outline the V-I Characteristics of TRIAC with a neat diagram.	CO1	**5**
		(OR)		
2.	a.	Explain the Static and switching characteristics of Thyristor.	CO1	**15**
	b.	What is meant by commutation? Also mention its types.	CO1	**5**
3.	a.	Sketch the circuit diagram of single phase dual converter and explain its working.	CO2	**6**
	b.	A single phase fully controlled full bridge converter is supplied by 230V, 50Hz. It is connected with R-L Load. i) Determine the average and rms output voltage if the firing angle is 45°. ii) Calculate the firing angle for which the average output voltage of the converter is 100V.	CO2	**14**
		(OR)		
4.	a.	Compare single phase full and semi controlled converters.	CO3	**5**
	b.	Explain the operation of a single phase half controlled converter bridge for resitive load with neat diagram and waveforms.	CO2	**15**
5.	a.	Analyze the working of single phase to single phase step down cyclo-converter with circuit diagram and waveforms. Also obtain the expression for rms output voltage.	CO2	**20**
		(OR)		
6.	a.	Recommend a DC to DC Converter which can operate in all the four quadrants.	CO2	**15**
	b.	A type – A chopper has V_{dc} = 200 V, R = 10 Ohms. If the duty cycle is 0.54, calculate average voltage V_{avg}, rms voltage V_{rms}, average current I_{avg} and output power P_o	CO2	**5**
7.	a.	Describe the operation of three phase inverter in 120° mode conduction with necessary circuit diagram, waveforms. Derive the expression for the RMS value of phase voltage and line voltage.	CO2	**20**
		(OR)		
8.	a.	What is PWM? Also mention its advantages and disadvantages.	CO3	**5**
	b.	Explain about the working of single phase full bridge inverter with relevant circuit diagram and waveforms. Also obtain the expression for the rms output voltage.	CO2	**15**
		Compulsory:		
9.	a.	Discuss the working of UPS with neat circuit diagram.	CO3	**10**
	b	With a neat circuit diagram, explain any one type of firing circuit used for Thyristor.	CO2	**10**

ALL THE BEST

Course Outcomes:

The student will be able to

CO1: Know the usage of electronics and solid-state power devices for the control, conversion, and protection of electrical energy.

CO2: Design power electronics circuits based on criteria (power, efficiency, ripple voltage and current, harmonic distortions, power factor).

CO3: Select components; interpret terminal characteristics of the components for designing the circuitry for power converters.