Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – April / May – 2017**

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| **Code :** | **14EE2010** | **Duration :** | **3hrs** |
| **Sub. Name :** | **P0WER ELECTRONICS** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | Marks |
| 1. | a. | With neat diagram describe the switching characteristics of Power MOSFET. | CO1 | 10 |
| b. | Justify - TRIAC is operated in four quadrants. | CO1 | 10 |
| (OR) | | | | |
| 2. | a. | Compare Power MOSFET and Power BJT. | CO1 | 5 |
| b. | Explain the Static and switching characteristics of Thyristor. | CO1 | 15 |
| 3. | a. | 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 60°.  ii) Calculate the firing angle for which the average output voltage of the converter is 200V. | CO2 | 14 |
|  | b. | Outline the significance of free wheeling diode. | CO3 | 6 |
| (OR) | | | | |
| 4. |  | Explain the operation of a single phase fully controlled full bridge converter with RL load in rectifier mode with neat diagram and waveforms. Also obtain the expression for the average output voltage. | CO2 | 20 |
| 5. |  | Fixed AC voltage can be converted to variable AC Voltage – Justify this converter with necessary circuit and waveforms for R-Load. | CO2 | 20 |
| (OR) | | | | |
| 6. | a. | Explain the operation of the step down chopper with R load and derive the expression for the average value of the load voltage, load currents. | CO2 | 10 |
|  | b. | A type – A chopper has Vdc = 100 V, R = 10 Ohms. If the duty cycle is 0.6, calculate the average voltage Vavg, rms voltage Vrms, average current Iavg and output power Po | CO2 | 5 |
|  | c | Sketch the circuit diagram and waveform of single phase to single phase step down cyclo converter. | CO2 | 5 |
| 7. |  | Describe the operation of three phase inverter in 180° mode conduction with necessary circuit diagram, waveforms. Derive the expression for the RMS value of phase voltage and line voltage. | CO2 | 20 |
| (OR) | | | | |
| 8. |  | Explain PWM and its advantages. Elucidate any two PWM technique used for inverter circuits. | CO3 | 20 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Discuss the working of HVDC systems with relevant circuit diagram. | CO3 | 10 |
|  | b | With circuit diagram and waveforms explain the operation of phase controlled rectifier fed DC Motor Drive. | CO3 | 10 |