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 – Nov/Dec – 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **14EE3012** | **Duration :** | **3hrs** |
| **Sub. Name :** | **POWER ELECTRONIC CIRCUITS** | **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. | (i) Describe the any two methods of turn-on mechanism of SCR.  (ii) Explain the turn off characteristics of SCR. | CO1 | **10** |
| b. | Describe with relevant waveforms, expressions and diagram the operation of Fully controlled bridge converter R, RL load. Derive the average and RMS Voltages. | CO2 | **10** |
| **(OR)** | | | | |
| 2. | a. | Explain with diagram the various modes of working of TRIAC. | CO1 | **10** |
| 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 60°. ii) Calculate the firing angle for which the average output voltage of the converter is 200V. | CO2 | **10** |
| 3. | a. | What are the advantages of single phase bridge converter over single phase midpoint converter? | CO1 | **10** |
| b. | With necessary circuit and waveforms, explain the principle of operation of three phase controlled bridge rectifier feeding R-L load and derive the expression for the average output dc voltage. | CO2 | **10** |
| **(OR)** | | | | |
| 4. | a. | Explain the operation of single phase dual converter with circulating current type. | CO2 | **15** |
| b. | Explain the effect of source inductance in the operation of single phase fully  controlled converter, | CO2 | **5** |
| 5. | a. | Explain a DC to DC Converter which can operate in all the four quadrants. | CO2 | **15** |
| b. | What are the two types of control strategies? | CO1 | **5** |
| **(OR)** | | | | |
| 6. | a. | Describe the working principle of Multiphase chopper with necessary circuit and waveforms. | CO2 | **12** |
| b. | i) A type – A chopper has Vdc = 100 V, R = 10 Ohms. If the duty cycle is 0.4, calculate average voltage Vavg, rms voltage Vrms, average current Iavg and rms output p. | CO2 | **8** |
| 7. |  | Discuss the functioning of three phase voltage source inverter in 120 degree  Operating mode with relevant waveforms and obtain the expression for voltages. | CO2 | **20** |
| **(OR)** | | | | |
| 8. |  | Explain L type zero current switching resonant converters. | CO2 | **20** |
|  | | **Compulsory:** |  |  |
| 9. |  | Explain the operation of the step down cycloconverter both bridge and midpoint configuration with necessary waveforms. | CO3 | **20** |

ALL THE BEST