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 :** | **14EE2038** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ADVANCED TOPICS IN POWER 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. | Explain the working of power BJT. Draw the steady state characteristics with neat circuit diagram. | CO1 | 14 |
| b. | Compare power BJT with power MOSFET(Write any six points). | CO1 | 6 |
| (OR) | | | | |
| 2. |  | What is an IGBT? Give it basic structural feature. Also describe its output and transfer characteristics. | CO1 | 20 |
| 3. |  | With neat circuit diagram and waveforms, explain Diode clamped MLI and Flying capacitor MLI. Write their advantages and disadvantages. | CO1 | 20 |
| (OR) | | | | |
| 4. | a. | Explain the working of cascaded bridge Multi level inverter with neat diagram. | CO2 | 14 |
| b. | Compare various Multilevel inverters(Write any six points). | CO2 | 6 |
| 5. |  | Explain the following cooling methods for power electronic devices. Mention advantages and disadvantages of each method.   1. Air Cooling 2. Thermosyphon Cooling 3. Pool Boiling 4. Heat Pipes 5. Vibration Induced Droplet Atomization (VIDA) | CO2 | 20 |
| (OR) | | | | |
| 6. | a. | Explain various pulse width modulation techniques formulti level inverters with neat waveforms. | CO2 | 14 |
| b. | Give some applications of Multilevel Inverters. | CO2 | 6 |
| 7. | a. | Explain the various modes of operation of Z source inverter, with neat diagrams. | CO1 | 14 |
| b. | Tabulate its performance with CSI and VSI(Write any six points). | CO1 | 6 |
| (OR) | | | | |
| 8. | a. | With neat circuit diagram, explain Resonant DC-link inverter. | CO2 | 14 |
| b. | Mention its advantages over PWM controlled inverters. | CO2 | 6 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Explain with necessary circuit diagram and waveforms the operation of Class E resonant inverters. | CO2 | 12 |
| b. | Discuss the importance of resonant converters. | CO2 | 8 |