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



**End Semester Examination – Nov/Dec – 2017**

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| **Code :** | **14EE2010** | **Duration :** | **3hrs** |
| **Sub. Name :** | **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. | With neat diagram describe the switching characteristics of Power BJT. | CO1 | 10 |
| b. | With appropriate diagrams, explain four quadrant operations of TRIAC. | CO1 | 10 |
| (OR) | | | | |
| 2. | a. | What is meant by commutation? Also mention its types. | 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.   1. Determine the average and rms output voltage if the firing angle is 60°. 2. Calculate the firing angle for which the average output voltage of the converter is 200V. | CO2 | 14 |
| b. | List out the difference between the semi converter and full converter. | CO3 | 6 |
| (OR) | | | | |
| 4. | a. | Explain the operation of a single phase to single phase cyclo converter with neat diagram and waveforms. | CO2 | 15 |
|  | b. | Compare MOSFET and IGBT. | CO2 | 5 |
|  |  |  |  |  |
| 5. |  | With relevant circuit diagram and waveforms, explain the operation of single phase bidirectional ac-ac converter with R load. Also obtain the expression for the rms output voltage. | 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 step down chopper has Vdc = 200 V, R = 20 Ω. If the duty cycle is 0.8, calculate the average voltage Vavg, rms voltage Vrms, average current Iavg and output power Po | CO2 | 10 |
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| 7. |  | Describe the operation of three phase inverter in 180° mode conduction with necessary circuit diagram and waveforms. Write the expression for the rms value of phase voltages and line voltages. | CO2 | 20 |
| (OR) | | | | |
| 8. | a. | Explain how harmonic reduction is achieved in Power electronic circuits. | CO3 | 10 |
|  | b. | The single phase half bridge inverter has a resistive load of R=2.4Ω and the dc input voltage is Vs=48V. Determine i. rms output voltage ii. the rms output voltage at the fundamental frequency iii. the output power. | CO3 | 10 |
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|  | | **Compulsory:** |  |  |
| 9. | a. | Discuss the working of HVDC systems with relevant circuit diagram. | CO3 | 10 |
|  | b | With a neat circuit diagram, explain any one type of firing circuit used for Thyristor. | CO3 | 10 |

ALL THE BEST