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



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

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| **Code :** | **17EE3015** | **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. | Construct the storage charge QRR and the peak reverse current IRR of a Power Diode, if the reverse recovery time of a diode is trr = 5μs and the rate of fall of the diode current is di/dt = 100A/μs. | CO1 | 5 |
| b. | Briefly explain the reverse recovery characteristics of a Power Diode in detail. | CO2 | 10 |
| c. | Give a brief idea about new devices in Power Electronic Circuits. | CO1 | 5 |
| (OR) | | | | |
| 2. | a. | Elucidate the static V-I and switching characteristics of Thyristor with neat diagrams and waveforms. | CO4 | 15 |
| b. | Compare Power MOSFET and Power BJT. | CO1 | 5 |
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| 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. | CO6 | 10 |
| b. | Explain the operation of a single phase fully controlled full bridge converter in rectifier mode with neat diagram and waveforms. | CO4 | 10 |
| (OR) | | | | |
| 4. | a. | Give the similarities and differences between single phase full and semi controlled converters | CO2 | 5 |
| b. | Suggest a circuit that can used for controlling (firing) thyristors which are used in a single phase semi controlled bridge converters. | CO2 | 10 |
| c. | Sketch a single phase dual converter circuit. | CO1 | 5 |
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| 5. | a. | Recommend and explain a DC to DC Converter which can operate in all the four quadrants. | CO4 | 15 |
| b. | A type – A chopper has Vdc = 200 V, R = 10 Ohms. If the duty cycle is 0.4, calculate average voltage Vavg, rms voltage Vrms, average current Iavg and output power Po | CO4 | 5 |
| (OR) | | | | |
| 6. | a. | Name the control strategies of DC Chopper circuit. | CO4 | 8 |
|  | b. | Briefly discuss about buck-boost and CUK regulators. | CO3 | 12 |
|  |  |  |  |  |
| 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. | CO5 | 20 |
| (OR) | | | | |
| 8. | a. | Explain the working of single phase full bridge inverter with relevant circuit diagram and waveforms. | CO5 | 15 |
| b. | Compare Voltage and Current Source Inverters. | CO3 | 5 |
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|  | | **Compulsory:** |  |  |
| 9. | a. | Fixed AC voltage can be converted to variable AC Voltage – Justify this converter with necessary circuit and waveforms for R-Load. | CO6 | 14 |
|  | b. | List out the applications of AC Voltage Controller and Cycloconverter | CO4 | 6 |

ALL THE BEST