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**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

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

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

**End Semester Examination – Nov / Dec - 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **11EE212/ 12EE212/ EE254** | **Duration :** | **3 hrs** |
| **Sub. Name :** | **POWER ELECTRONICS** | **Max. marks :** | **100** |

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| **Q. No.** | **Questions** | **Marks** |
| **PART - A (10X1 =10 MARKS)** | | |
| 1. | The number of PN junctions in a Thyristor (SCR) is \_\_\_. | (1) |
| 2. | \_\_\_\_ is the power semiconductor device which has highest switching frequency | (1) |
| 3. | In a single phase fully controlled bridge converter, the converter attains the inverter mode of operation when the firing angle goes beyond \_\_\_\_. | (1) |
| 4. | Single Phase dual converter is a four quadrant converter – True of False. | (1) |
| 5. | Phase control and integral cycle control are the control strategies of \_\_\_\_\_\_\_\_\_\_\_. | (1) |
| 6. | Another name of the variable frequency system is \_\_\_\_\_\_\_\_\_\_\_. | (1) |
| 7. | The most efficient method for controlling the output voltage of an inverter is \_\_\_\_\_. | (1) |
| 8. | A single phase half bridge inverter is supplied with DC voltage 100V. Its rms output voltage is \_\_. | (1) |
| 9. | Why do you need isolation between gating circuits and power circuits? | (1) |
| 10. | \_\_\_\_ and \_\_\_\_\_ are the power converters used in HVDC systems | (1) |

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| **PART - B (5 X 3 = 15 MARKS)** | | |
| 11 | Sketch the V-I Characteristics of TRIAC. | (3) |
| 12 | Give the Significance of free-wheeling diode. | (3) |
| 13 | List out the applications of Cycloconverter. | (3) |
| 14 | Brief out PWM. | (3) |
| 15 | Write briefly about types of HVDC links. | (3) |

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| **PART – C (5 X 15 = 75 MARKS)** | | | |
| 16. | a. | Compare Power BJT with Power MOSFET. | (7) |
| b. | With neat diagram discuss the operation of Power Diode during reverse recovery mode. | (8) |
| (OR) | | | |
| 17. |  | Explain the static and switching characteristics of Thyristor(SCR) in detail with neat diagrams. | (15) |
| 18. |  | Draw and explain the operation of single phase fully controlled converter with RL load. Also derive the average and rms output voltage of the rectifier. | (15) |
| (OR) | | | |
| 19. | a. | Determine the average and rms output voltage of single phase 230V, 50Hz fully controlled bridge converter with R Load, if the firing angle is 60 degree. Also find the firing angle if the average output voltage of the converter is 200V. | (8) |
| b. | Compare of single phase full and semi-controlled converter. | (7) |
| 20. |  | With necessary circuit, equations and waveforms elucidate the operation of single phase AC voltage regulator connected to a resistive load. | (15) |
| (OR) | | | |
| 21. | a. | Recommend a DC to DC converter which can operate in all the four quadrants. | (10) |
| b. | A type-A chopper has Vdc = 100V, R = 10 ohms. If the duty ratio is 0.4, Calculate average, rms output voltages and output power. | (5) |
| 22. |  | Discuss the working of three phase VSI in 180 degree mode of operation with neat sketches and waveforms. | (15) |
| (OR) | | | |
| 23. | a. | Give the similarities and differences between voltage source and current source inverters | (5) |
| b. | Describe the operation of single phase series inverter with necessary circuit diagram and wave forms. | (10) |
| 24. |  | With circuit diagram and waveforms explain the operation of phase controlled rectifier fed DC Motor Drive | (15) |
| (OR) | | | |
| 25. |  | Draw the block diagram of various types of UPS and explain the functions of each block in them. | (15) |

ALL THE BEST