Reg No.:_____ Name:_____

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

SIXTH SEMESTER B.TECH DEGREE EXAMINATION(S), DECEMBER 2019

**Course Code: AE312**

**Course Name: POWER ELECTRONICS**

Max. Marks: 100 Duration: 3 Hours

**PART A**

***Answer any two full questions, each carries 15 marks.*** Marks

| | | | |
|---|---|---|---|
| 1 | a) | Draw the structure of Power diode and explain its operating principle. | 10 |
| | b) | What is reverse recovery time of a diode? | 5 |
| 2 | a) | With two transistor analogy explain the characteristics of SCR. | 10 |
| | b) | Explain safe operating area of Power BJT. | 5 |
| 3 | | Explain the working of single phase fully controlled bridge rectifier with RL load. Draw relevant waveforms. | 15 |

**PART B**

***Answer any two full questions, each carries 15 marks.***

| | | | |
|---|---|---|---|
| 4 | a) | Explain the principle of operation of chopper. | 5 |
| | b) | Describe the principle of step-up chopper. Derive the expression for the average output voltage in terms of input voltage and duty cycle. | 10 |
| 5 | a) | With circuit diagram explain the operation of full bridge inverter | 10 |
| | b) | Draw the circuit diagram of single phase McMurray-Bedford full bridge inverter | 5 |
| 6 | | Write short notes on (1) voltage control of inverters (2) current source inverters (3) vector control of induction motors | 15 |

**PART C**

***Answer any two full questions,each carries 20 marks.***

| | | | |
|---|---|---|---|
| 7 | a) | Describe ON line and OFF line UPS. | 10 |
| | b) | List various types of SMPS. Describe SMPS with Push-Pull configuration. | 10 |
| 8 | a) | Explain the drive requirements of Power BJT. | 10 |
| | b) | With circuit diagram, explain any two base drive circuits for Power MOSFET. | 10 |
| 9 | | Explain the methods for control of power electronic circuits using microprocessors and microcontrollers. | 20 |

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