

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

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**EIGHTH SEMESTER B.TECH DEGREE EXAMINATION, MAY 2019**

**Course Code: MR404**

**Course Name: Power Electronics and Drives**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer all questions, each carries 5 marks.*

Marks

- |   |   |     |
|---|---|-----|
| 1 | Explain any one triggering methods  | (5) |
| 2 | What is the basic principle of 3 phase converter  | (5) |
| 3 | Explain with block diagram AC link chopper and DC chopper   | (5) |
| 4 | Explain the requirements of a good inverter.  | (5) |
| 5 | Explain the operation of a unidirectional ac voltage controller.                                    | (5) |
| 6 | Discuss the working of a bidirectional single phase ac voltage controller feeding a resistive load. | (5) |
| 7 | Give the advantages of electric drive.  | (5) |
| 8 | Describe the components of load torque.   | (5) |

**PART B**

*Answer any three full questions, each carries 10 marks.*

- |    |  |      |
|----|--|------|
| 9  | a) Write a short note on power MOSFET.   | (3)  |
|    | b) Explain power MOSFET with input output characteristics.   | (7)  |
| 10 | a) What is input power factor?   | (3)  |
|    | b) Derive the expression of input power factor for single phase controlled converter.  | (7)  |
| 11 | a) Explain the principle of stepup chopper   | (5)  |
|    | b) Derive an expression for average output voltage in terms of duty cycle and input dc voltage   | (5)  |
| 12 | a) Explain the principle of operation of single phase half bridge inverter   | (5)  |
|    | b) Explain Single phase full bridge inverter   | (5)  |
| 13 | a) A dc chopper has a resistive load of $20\Omega$ and input voltage is 220V. When chopper is ON, its voltage drop is 1.5 volts and chopping frequency is 10 kHz. If the duty cycle is 80%, determine the average output voltage and the chopper on time | (10) |

**PART C**

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

- 14 a) For a single phase fully controlled ac voltage controller supplying a resistive load, derive expression for, rms value of the output voltage. (15)
- 15 a) Explain the working of single phase step down cyclo-converter with bridge configuration feeding an R load with neat sketch. (15)
- 16 a) Elucidate about the load torque and its types. (8)
- b) List the parts of electric drive and explain the operation of electric drive. (7)
- 17 a) Mention factors affecting the steady state stability. (8)
- b) Interpret about the four quadrant operation with neat diagram (7)

\*\*\*\*