

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

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|---|---|-----|
| 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.

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| 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 20Ω 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)
