

School of Engineering**M.Tech Power System Engineering Summer /
backlog - Semester End Examination - Jul 2024****Duration : 180 Minutes
Max Marks : 100****Sem I - G2PI103B - Analysis of Power Electronics Circuits***General Instructions**Answer to the specific question asked**Draw neat, labelled diagrams wherever necessary**Approved data hand books are allowed subject to verification by the Invigilator*

- 1) Compare step-up chopper and step-down chopper. K1(2)
- 2) Explain the working principle of 1-phase voltage controller with R load. K2(4)
- 3) A step-up chopper has input voltage of 110V and output voltage of 330V. The conducting time of switch is 100 microseconds. Find the off time of the switch. K2(6)
- 4) Construct a 1-phase voltage controller with RL load and explain its working. K3(9)
- 5) Make use of pulse width modulation and frequency modulation for varying the duty cycle of chopper circuits. K3(9)
- 6) Describe the Type-D and Type-E classification of Choppers with appropriate circuit diagram. K5(10)
- 7) With the help of appropriate figure and waveforms discuss the importance of sinusoidal pulse-width modulation. K4(12)
- 8) With appropriate figures and waveforms determine the working of three-phase ac voltage controller. K5(15)
- 9) Assess the different thyristor turn-on methods with their operations. K5(15)
- 10) A step down chopper has $V_s = 230$ V and $R = 10$ Ω . For a duty cycle of 0.4, the power taken by the chopper is 2097 Watts. Find the chopper efficiency. Take the voltage drop across the chopper switch as 2 V. K6(18)