Nirma University
Institute of Technology
Department of Electrical Engineering
2EE405: Power Electronic Converters and Applications
Assignment – 1

Issued Date: **17th March 2020** Submission Date: **15th April 2020**
Max.Marks:30

Q-1. CO1 BL2	Discuss the construction, operation and performance characteristics of following devices: (1) Thyristor (2) MOSFET (3) IGBT	(06)
Q-2. CO1 BL2	Discuss different operating modes of TRIAC with necessary diagrams	(03)
Q-3. CO1 BL4	Compare silicon carbide and Gallium nitride devices with conventional Power Electronic devices	(02)
Q-4. CO1 BL2	Discuss in detail operation of following devices: (1) UJT (2) GTO	(03)
Q-5. CO1 BL4	Elaborate on the concept of voltage controlled and current controlled devices. Also, discuss IGBT and MOSFET are voltage or current controlled.	(03)
Q-6 CO2 BL3	A three phase fully controlled bridge converter operating from a 3 phase 300 V, 50 Hz supply is used to resistive load of 20 Ω with operating voltage of 260 V ± 10%. Assuming continuous conduction find out: (i) The range of firing angle of the converter (ii) The range of ac input power factor	(03)
Q-7 CO2,3 BL4	Analyze the operation of three-phase fully controlled bridge rectifier feeding (1) R-L and (2) R-L-E load, each for firing angle 30^o and 60^o.	(04)
Q-8 CO2 BL3	A single phase fully controlled bridge converter operates from a 230V, 50HZ single phase supply with a firing angle $\alpha = 30°$. The load resistance and inductances are 10Ω and 50mH respectively. Evaluate the average output voltage and current.	(02)
Q-9 CO3 BL4	Analyze the operastion of buck-boost converter for continuous as well as discontinuous mode of conduction	(04)