2015
B.E. (Electronics and Communication Engineering)
Sixth Semester
EC-625: Power Electronics

Time allowed: 3 Hours   Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Section.

x-x-x

Q.1a)	What is the difference between natural commutation and forced commutation?	(5×2)
b)	What is the difference between power diode and signal diode	
c)	Define the term holding current and latching current.	
d)	What is the difference between ON-OFF control and phase control?	
e)	What is the function of freewheeling diodes in controlled rectifier?	
Section A		
Q.2a)	List any two advantages of TRIAC over SCR.Define the terms: ripple factor, harmonic factor.	(5)
b)	Describe with circuit IGBT static I-V, transfer and turn –on and turn–off characteristics.	(5)
Q.3a)	Describe the principle of step-up chopper. Derive an expression for the average output voltage in terms of input dc voltage & duty cycle.	(7)
b)	What are the advantages of 'RC' triggering over 'R' triggering.	(3)
Q.4a)	What is constant frequency control of chopper? Differentiate voltage and current commutated choppers.	(5)
b)	For step down chopper dc source voltage is 230V, load resistance is 10 ohm. The voltage drop across chopper when it is in ON is 2V. For a duty cycle of 0.4. Calculate the chopper efficiency.	(5)
Section B		
Q.5a)	A two pulse converter is fed with a 230V, 50 Hz supply. The load on the converter is a pure resistance of R=10 Ω. Obtain the average output voltage for a firing angle of α =135°.	(7)
b)	What is resonant switching? Explain its concept with relevant circuit diagram.	(3)
Q.6a)	Describe in detail, the various types of PWM methods available for voltage control employed in an inverter.	(5)
b)	Why thyristors are not preferred for Inverter?	(5)
Q.7a)	A single phase voltage controller is employed for controlling the power flow from 230V, 50Hz source into a load circuit consisting of R=3 Ω and L=4 Ω. Calculate: (i) the maximum value of rms load current (ii) the maximum power and power factor.	(4)
b)	Discuss the application of inverter in Induction heating and UPS.	(3)
c)	Explain the working principle of SMPS and discuss about its industrial applications.	(3)

x-x-x