TE Sem VI (Electronics) CBGS
Power Electronics

14/12/2016

QP Code :591901

(3 Hours) **[Total Marks :80**

N.B. : (1) Question No. 1 is compulsory.
(2) Attempt any **three** questions out of remaining questions.
(3) **Assume** suitable **data** wherever **necessary.**

1. Solve any **four**. **20**
   (a) Explain dynamic characteristics of SCR
   (b) Compare IGBT and Power BJT
   (c) What is need of free wheeling diode in rectifiers with example.
   (d) Draw and explain DIAC characteristics
   (e) What is the need of thyristors in Electronic Circuits?

2. (a) Draw and explain full controlled rectifier with R-L load .Draw waveforms when a = 60° **10**
   (b) Explain working of step up Chopper with proper waveforms. **10**

3 (a) A single phase half bridge inverter has resistive load of 8 ohms and DC input voltage Edc=50V Calculate: **10**
   (i) RMS output Voltage
   (ii) Average and Peak current of each Thyristor
   (iii) Output Power Po
   (b) Explain voltage control technique in Inverter using sinusoidal PWM method **10**

4. (a) Explain dual converter with proper waveforms **10**
   (b) Explain working of three phase bridge Inverter. **10**

5. (a) Explain Power MOSFET construction and characteristics. Give one application **10**
   (b) Design relaxation oscillator circuit for SCR using UJT for following data: **10**
   $\eta = 0.71, Ip = 0.5mA, Vp = 16V, Iv = 2.5mA, Rbb = 5.5K\Omega$. with emitter open.
   The firing frequency is 3KHz, C=0.047 μF

6. Write short notes on:- **20**
   (a) Buck-Boost mode regulator
   (b) Protection circuits for SCR
   (c) Cyclo-converters and applications
   (d) Forced commutation in SCR