Code No: RT31025   **R13**   SET - 1

III B. Tech I Semester Supplementary Examinations, May -2016
POWER ELECTRONICS
(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1	a)	What is the most effective method of turning on an SCR? Explain.	[3M]
	b)	What is the difference between a semi convertor & fully controlled convertor?	[4M]
	c)	What is TRIAC? What are the effective modes of operation of a TRIAC?	[3M]
	d)	What is a cyclo convertor? What are its types?	[4M]
	e)	What is a motoring chopper? Give expression for input and output voltage.	[3M]
	f)	What is a series inverter? Briefly explain.	[4M]

PART -B

2 a) Explain turn on characteristics of SCR and mention different factors that influence the turn on time of SCR. [6M]
   b) Explain turn-on and turn-off process of GTO with necessary diagram. [6M]
   c) Why is pulse train gating preferred over pulse gating? [4M]

3   Explain the following converters with neat circuit diagrams and waveforms:
   a) 1- phase full converter with R-L Load [6M]
   b) 3- phase full bridge converter with R Load [5M]
   c) 1- phase semi converter with R-L-E Load. [5M]

4 a) Explain the principle of operation of Class A Chopper with a neat circuit diagram. [6M]
   b) A Class-A chopper is supplied from a battery of voltage 120V. The load voltage waveform consists of rectangular pulses of duration 2m sec followed by off periods of 2.5 msec. Determine the average and r.m.s values of the supply voltage, r.m.s value of the fundamental component of supply voltage and ripple factor. [10M]

5 a) Explain single phase bridge inverter with neat circuit diagram. [8M]
   b) Explain single phase CSI with ideal switches with neat circuit diagram and waveforms. [8M]

6 a) What is the difference between A.C. Voltage controller and a Cyclo convertor. [8M]
   b) Explain the operation of a step down cycloconvertor with $f_o = 2f_s$. [8M]

7 a) Discuss the operation of a single-phase half bridge inverter. [8M]
   b) Explain the implementation of sine triangular PWM technique. [8M]

*****