CODE NO : RR 310204

# 2005 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

III B.TECH I SEMESTER REGULAR EXAMINATIONS

POWER ELECTRONICS

(ELECTRICAL ELECTRONICS ENGINEERING)

NOVEMBER 2005

TIME: 3 HOUR
MARK: 100

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**ANSWER ANY FIVE QUESTIONS ALL QUESTIONS CARRY EQUAL MARKS**

1. (a) What is the importance of Surge current rating of a thyristor, explain in detail.

(b) A thyristor has half-cycle surge current rating of 1000mA for a 50Hz supply. Calculate its one-cycle surge current rating and I2t rating.

2. (a) What are the features of Half -controlled converters over full controlled converters.

(b) Bring out the features of Free-wheeling diode used in converters.

3. Explain the operation of three phase half-wave controlled converter with resistive load, and inductive load. Sketch the associated waveforms.

4. A single phase full wave ac voltage controller has a resistance load of

(a) 10 ohms and

(b) 5 ohms. The input ac voltage is 230V, 50Hz. For a delay angle of 900, determine the rms load voltage, rms load current, rms thyristor current and input power factor for above two loads.

5. Discuss the working of a single phase mid point cyclo converter with R-L loads and for discontinuous operation with neat circuit diagram and output rms voltage and current waveforms for f0=1/3 fs.

6. Explain the operation of a basic dc chopper and obtain the following as a function of Edc, R and duty cycle (a) average output voltage and current

(b) rms value of the output voltage

(c) RMS and average load currents

7. Explain the auxiliary impulse commutation techniques used in the bridge type single phase inverter with neat circuit diagram.

8. Explain the voltage control in case of single phase bridge inverter circuit, in order to get variable voltage and variable frequency output.