Roll No.....

National Institute of Technology Delhi

Name of the Examination: B.Tech

Branch : **EE** & ECE

Semester : VI

Course Name : **Power Electronics**

Course Code : EEB-351

Time: 1:30 hour

Maximum Marks: 25

Note:

- All Questions are compulsory.
- Do not write irrelevant theory and draw neat waveforms and circuit diagrams.
- Assume data where ever required.

Q1) Explain the various mechanisms by which thyristors can be triggered into conduction.(5)

Q2) A single-phase full converter feeds power to RLE load. For discontinuous load current, draw the source voltage, output voltage, load current, source current waveforms as a function of time when: (a) extinction angle, $\pi < \beta < (\pi+\alpha)$ (b) draw the output voltage & load current waveforms when: extinction angle $\beta < \pi$ with $V_m \sin \beta < E$.
Explain how various waveforms are obtained and discuss their nature. (5)

Q3) Discuss the effect of source inductance with the help of typical voltage and current waveforms on the performance of a single-phase full converter indicating clearly the conduction of various thyristors during one cycle. (5)

Q4) Discuss the working of a three phase half wave converter with R load for $\alpha = 15$ degree and $\alpha = 45$ degree. Illustrate your answer with waveforms for source voltage, load voltage and load current. Assume continuous conduction. Further derive the expression of average and rms voltage for both the cases in terms of line voltage. (6)

Q5) Explain the working of three phase full wave converter with R load for $\alpha = 0$ degree. Draw and discuss the waveforms for source voltage, load voltage and load current for continuous conduction. (4)