Roll No.:.....

National Institute of Technology, Delhi

Name of the Examination: B. Tech.

Branch	**: EE &ECE**	**Semester**	**: 6th**
Title of the Course	**: Power Electronics**	**Course Code**	**: EEB 351**

Time: 3 Hours **Maximum Marks: 50**

Note : 1. Do not write anything on the question paper except Roll number

2. Assume any data suitably if found missing

3. Draw circuit diagram and waveforms neatly

Section A: Answer all 10 questions. Each question carries 01 mark. [10×1=10]

Q1). What is the difference between MOSFET and BJT.

Q2). Explain the significance of latching and holding current.

Q3). Draw the circuit of 3 phase dual converter.

Q4). Define commutation.

Q5). What are merits and demerits of four quadrant choppers.

Q6). Write applications of choppers.

Q7). What is a feedback diode.

Q8). What is a pulse width modulation? List the various PWM techniques.

Q9). Define cycle selection.

Q10). What is a cyclo-converter. What are its industrial applications?

Section B. Each question carries 5 marks. [4×5=20]

Q11). Draw the V-I characteristics of the SCR and explain its different modes. Explain *di/dt* and *dv/dt* ratings of SCR.

Q12). Explain step up and step down chopper and derive the expression for their duty cycles. For a step down chopper, source voltage(V_s)=230 V, R=10 ohm calculate the average output voltage and rms output voltage if the drop across chopper is of 1volt and duty cycle is of 0.4.

Q13). Explain and draw the waveforms for a single phase inverter for RL load. Discuss the harmonic reduction technique by transformer connections.

Q14). Explain the two stage sequence control of voltage source controllers for RL load.

Section C: Each question carries 10 marks. **[2×10=20]**

Q15). Explain the operation of 3 phase inverter employing 180 degree mode of operation. Draw the waveforms of phase voltages and line voltages, assume the star connected resistance load.

Q16). Explain the basic principle of a single phase to single phase step down cycloconverter for both continuous and discontinuous conduction modes and draw their waveforms for output voltage and output current.