Seat No: _____ **Enrollment No: _____**

PARUL UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

M.Tech., Winter 2017 - 18 Examination

Semester: 1 **Date: 30/12/2017**

Subject Code: 03203103 **Time: 2:00 pm to 4:30 pm**

Subject Name: Power Electronics & Converters **Total Marks: 60**

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 A) Describe IGBT construction with necessary static characteristics. **(05)**

B) Give Comparison between Power MOSFET and Power BJT. **(05)**

C) What do you mean by soft switching? How the ZCS and ZVS principle can help in achieving it? Discuss its significance in brief using the switching loci for the following cases: (i) hard switching (ii) switching when ZCS and/or ZVS are employed. **(05)**

Q.2 **Answer the following questions. (Attempt any three)** **(15)**

A) Explain the Diode Clamped multilevel inverter.

B) Discuss operation of Cascaded H-bridge multilevel inverter.

C) Explain Matrix converter with neat diagram.

D) Describe any one application of unity power factor rectifier.

Q.3 A) Explain the Construction and V-I characteristics of SCR. **(07)**

B) Draw and explain circuit diagram and output waveform of 6-pulse converter. **(08)**

OR

B) With neat waveforms discuss the operation of ZVS-CV (Zero Voltage Switching-Clamped Voltage) dc-dc converter. **(08)**

Q.4 A) List out different configuration of phase shift transformers? Explain Δ / Z-1? **(07)**

OR

A) Describe in brief design of current transformer. **(07)**

B) Explain Flying Capacitor 5-level multilevel inverter configuration, Features of Diode Clamped multilevel inverter and Advantages and Disadvantages of Diode Clamped multilevel inverter. **(08)**