GUJARAT TECHNOLOGICAL UNIVERSITY ME – SEMESTER-1 (OLD) EXAMINATION – WINTER 2016

Subject Code: 714501N Subject Name: Power Electronics-I Time:10:30 Am to 1:00 Pm Instructions:

Total Marks: 70

Date:17/11/2016

- 1. Attempt all questions.
 - 2. Make suitable assumptions wherever necessary.
 - **3.** Figures to the right indicate full marks.
- Q.1 (a) Explain need of Gate and Base Drive Circuits. Discuss any one in Gate Drive 07 Circuit on detail with necessary circuit.
 - (b) List the importance of the CUK Converter. Explain the same with necessary 07 diagram and waveforms.
- Q.2 (a) Explain need of Selective of Harmonic Elimination. Draw necessary diagram 07 in support to justify the concept.
 - (b) Explain operation of Single Phase Half Bridge Inverter having R-L load. Draw 07 the necessary circuits and waveforms to support the answer.

OR

- (b) Explain operation of Single Phase Full Bridge Inverter having R-L load. Draw 07 the necessary circuits and waveforms to support the answer.
- Q.3 (a) Explain the importance of Hysteresis losses and Eddy current losses in the 07 designing of magnetic component. Support the answer with necessary diagram.
 - (b) Explain the Push-Pull DC-DC converter with neat circuit diagram and draw all 07 the necessary waveforms in support.

OR

- Q.3 (a) Explain the importance of Skin effect and Proximity effect in the designing of 07 magnetic component. Support the answer with necessary diagram.
 - (b) Explain operation of Full bridge DC-DC Converter. Also explain various Pulse 07 Width Modulation strategies with respect to same.
- Q.4 (a) Explain operation of Three Phase Bidirectional AC Voltage Controller 07 considering Star connected Resistive load. Also draw necessary waveforms of line and phase quantities.
 - (b) Explain the effect of Source Impedance on the performance of single phase full 07 converter. Draw necessary diagram in support.

OR

- Q.4 (a) Explain operation of Three Phase Bidirectional AC Voltage Controller 07 considering Delta connected Resistive load. Also draw necessary waveforms of line and phase quantities.
 - (b) Explain Operation of Dual Converter without Circulating Current. Support 07 answer with necessary diagrams.
- Q.5 (a) Explain operation of Three Phase Semi-converter considering highly Inductive 07 load. Support the answer with necessary equations, circuit and waveforms.
 - (b) Explain 3-phase bridge inverter in 180° Conduction Mode considering 07 Resistive Load. Draw necessary waveforms in support.

- Q.5 (a) Explain Fly-back Converter derived from Buck-Boost Converters. Support the 07 answer with necessary circuits and waveforms.
 - (b) Explain 3-phase bridge inverter in 120° Conduction Mode considering 07 Resistive Load. Draw necessary waveforms in support.
