# **GUJARAT TECHNOLOGICAL UNIVERSITY** BE - SEMESTER-VII(OLD) • EXAMINATION – WINTER 2016

# Subject Code: 170906Date: 18/11/2016Subject Name: Advanced Power Electronics - I (Department Elective - I)Time: 10:30 AM to 01:00 PMInstructions:

# 1. Attempt all questions.

- 2. Make suitable assumptions wherever necessary.
- 3. Figures to the right indicate full marks.
- Q.1 (a) Discuss basic concept of multilevel inverter. Write advantages and 07 disadvantages of multilevel inverter.
  - (b) Discuss two quadrant ZVS converter with necessary circuit diagram and 07 waveforms.
- Q.2 (a) Explain operation of 12-pulse converter with circuit diagram and input-output 07 voltage waveforms.
  - (b) Discuss push pull converter and its application in dc power supply. 07

#### OR

- (b) Explain operation and control of On-Line and Off-Line UPS. 07
- Q.3 (a) List applications of multilevel inverter. Explain any one. 07
  - (b) Explain the forward converter with waveform. Derive its output voltage 07 expression.

### OR

- Q.3 (a) Discuss operation of Five level Cascaded multilevel inverter. Derive phase and 07 line voltage waveforms.
  - (b) Give classification of resonant converters. Give analysis of basic series 07 resonance circuit.
- Q.4 (a) With neat circuit diagram and waveform discuss class E resonant inverter. 07
  - (b) Compare multipulse converter with multilevel inverter. 07

## OR

- Q.4 (a) Discuss working and operation of Brushless dc motor. Show derivation of 07 switching pulses using Hall sensor signals.
  - (b) Discuss operation of diode clamped multilevel inverter. Discuss its merits 07 and limitations.
- Q.5(a) Write a short note on Variable reluctance Stepper Motor.07(b) Describe various transformer connections used for multipulse converter.07OR07
- Q.5 (a)Compare zero voltage resonant inverter with zero current resonant inverter.07(b)Discuss phenomenon of electromechanical energy conversion in SRM.07

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