

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

**Subject Code: 170906****Date: 18/11/2016****Subject Name: Advanced Power Electronics - I (Department Elective - I)****Time: 10:30 AM to 01:00 PM****Total Marks: 70****Instructions:**

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 disadvantages of multilevel inverter. **07**  
(b) Discuss two quadrant ZVS converter with necessary circuit diagram and waveforms. **07**
- Q.2** (a) Explain operation of 12-pulse converter with circuit diagram and input-output voltage waveforms. **07**  
(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 expression. **07**
- OR**
- Q.3** (a) Discuss operation of Five level Cascaded multilevel inverter. Derive phase and line voltage waveforms. **07**  
(b) Give classification of resonant converters. Give analysis of basic series resonance circuit. **07**
- 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 switching pulses using Hall sensor signals. **07**  
(b) Discuss operation of diode clamped multilevel inverter. Discuss its merits and limitations. **07**
- Q.5** (a) Write a short note on Variable reluctance Stepper Motor. **07**  
(b) Describe various transformer connections used for multipulse converter. **07**
- OR**
- 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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