

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VII (OLD) EXAMINATION – SUMMER 2019****Subject Code: 170906****Date: 10/05/2019****Subject Name: Advanced Power Electronics - I****Time: 02:30 PM TO 05:00 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) Explain basic series load resonance converter with necessary circuit diagram and waveforms. **07**  
 (b) Explain operation of 12-pulse converter with circuit diagram and necessary waveforms. **07**
- Q.2** (a) Discuss basic concept of multilevel inverter. Write advantages and disadvantages of multilevel inverter. **07**  
 (b) List the separate DC sources used for cascaded multilevel inverter. Explain operation of five level cascaded multilevel inverter. **07**
- OR**
- (b) Discuss operation of three level diode clamped multilevel inverter **07**
- Q.3** (a) Explain Y-Z1 transformer connection used for multipulse converter. **07**  
 (b) List application of multipulse converter. Draw the transformer connections for 18 and 24 pulse converter. **07**
- OR**
- Q.3** (a) Discuss operation of flying capacitor multilevel inverter. **07**  
 (b) Compare multipulse converter with multilevel inverter. **07**
- Q.4** (a) Explain working of forward converter based switch mode power supply. **07**  
 (b) Discuss two quadrant ZVS converter with necessary circuit diagram and waveforms. **07**
- OR**
- Q.4** (a) Discuss push pull converter and its application in dc power supply. **07**  
 (b) Explain operation of ZCS converter with diagram and wave forms. **07**
- Q.5** (a) Explain operation and control of On-Line and Off-Line UPS. **07**  
 (b) Discuss working and operation of Brushless dc motor. Show derivation of switching pulses using Hall sensor signals. **07**
- OR**
- Q.5** (a) Discuss phenomenon of electromechanical energy conversion in SRM. **07**  
 (b) With neat circuit diagram and waveform discuss class E resonant inverter. **07**

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