

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII • EXAMINATION – WINTER • 2014****Subject Code: 172403****Date: 04-12-2014****Subject Name: Power Processing Circuits-II****Time: 10:30 am - 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) List the performance parameters of inverters. Explain single-phase full-bridge inverter circuit with resistive load. **07**
- (b) Explain active front-end rectifier with necessary diagram. List disadvantages of controlled rectifier and advantages of active front-end rectifier. **07**
- Q.2** (a) Explain five-level flying capacitor multilevel inverter with circuit diagram and waveforms. **07**
- (b) Explain the McMurray-Bedford half-bridge inverter with circuit diagram and waveforms **07**
- OR**
- (b) Explain the single-phase parallel inverter with circuit diagram and waveforms. **07**
- Q.3** (a) Explain the three-phase 120° mode VSI with circuit diagram and waveforms. **07**
- (b) Explain single-phase ac voltage controller using phase control method for R-L load with circuit diagram and waveforms. **07**
- OR**
- Q.3** (a) Explain L-type ZCS resonant converter with circuit diagram and waveforms. **07**
- (b) Explain the single-phase to single-phase step-down midpoint cycloconverter considering discontinuous load current with circuit diagram and waveforms. **07**
- Q.4** (a) Explain the Sinusoidal PWM technique of the voltage control of inverter with waveforms and equations. **07**
- (b) Explain phase dead-banding with modulation reference waveforms. Explain triplen injection modulation. **07**
- OR**
- Q.4** (a) Explain multiple-pulse width modulation technique used for voltage control of single-phase inverters. **07**
- (b) Explain switching states and space vector diagram for two-level inverter. **07**
- Q.5** (a) Explain integral cycle control method used for voltage control in ac voltage controllers. Derive equation for rms value of output voltage and thyristor current. **07**
- (b) Draw the block diagram of a typical battery charger and explain each block in brief. Also explain the Ampere-Hour calculation for battery. **07**
- OR**
- Q.5** (a) Explain the three-phase to single-phase cycloconverter with circuit diagram and waveforms. **07**
- (b) Explain ON-Line and OFF-Line UPS with block diagram. **07**
