Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE- VII$^{th}$ SEMESTER–EXAMINATION – MAY/JUNE- 2012**

**Subject code: 172403** **Date: 09/06/2012**

**Subject Name: Power Processing Circuits II**

**Time: 02:30 pm – 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.**

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|---|---|---|---|
| **Q.1** | **(a)** | Explain the battery charging process and Ampere-Hour calculation for battery. | **07** |
| | **(b)** | Explain ON-Line and OFF-Line UPS with block diagram. | **07** |
| **Q.2** | **(a)** | Draw the schematic of active front-end rectifier. List its advantages and applications. | **07** |
| | **(b)** | List the performance parameters of inverter. Explain the working of single-phase full-bridge inverter with circuit diagram and waveforms. | **07** |
| | | **OR** | |
| | **(b)** | Explain the working principle of single-phase half-bridge inverter with circuit diagram and waveforms. List domestic and industrial applications of inverters. | **07** |
| **Q.3** | **(a)** | Explain the current source inverter with circuit diagram and waveforms. | **07** |
| | **(b)** | Explain the 120° conduction mode of three-phase inverter with circuit diagram and waveforms. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Explain the modified Mc-Murray half-bridge inverter with circuit diagram and waveforms. | **07** |
| | **(b)** | Explain the working of three-phase series inverter with neat circuit diagram. | **07** |
| **Q.4** | **(a)** | Explain zero-voltage switching resonant converter with circuit diagram and waveforms. | **07** |
| | **(b)** | Explain the diode-clamped 5-level multilevel inverter with circuit diagram and waveforms. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Explain features of multilevel inverter. List applications of multilevel inverter and explain any one in detail. | **07** |
| | **(b)** | With the help of circuit diagram and waveforms explain the two-stage sequence control of ac voltage controllers with R and RL load. | **07** |
| **Q.5** | **(a)** | Explain the working of three-phase to single-phase cycloconverter with circuit diagram and waveforms. | **07** |
| | **(b)** | Explain the Sinusoidal PWM technique of the voltage control of inverter with waveforms and equations. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | Explain the voltage control of inverter with output side control techniques. | **07** |
| | **(b)** | Explain phase dead-banding with modulation reference waveforms. Explain triplen injection modulation. | **07** |

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