

GUJARAT TECHNOLOGICAL UNIVERSITY**M. E. - SEMESTER – I • EXAMINATION – WINTER 2012****Subject code: 714505N****Date: 16-01-2013****Subject Name: Power Conditioning****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.

- Q.1** (a) Draw & explain basic series active filters. **07**
(b) Explain working of shunt active filter for constant power compensation with suitable block diagram. **07**

- Q.2** (a) Explain half bridge converter with neat circuit diagram and waveform. **07**
(b) Describe the operation of on line UPS system with the help of neat block diagram. Also, list the important specifications of on line UPS. **07**

OR

- (b) Describe PWM converter topologies for three phase four wire shunt active filter with necessary block diagrams. **07**

- Q.3** (a) Describe the forward converter with relevant diagram and waveform. **07**
(b) A UPS is driving an 800 W load which has a lagging power factor of 0.8. The efficiency of the inverter is 85%. The battery voltage is 48 V DC. Assume that there is a separate charger for the battery. Determine the following: **07**
1) kVA rating of inverter
2) Wattage of rectifier
3) AH rating for 30 min back up time

OR

- Q.3** (a) Explain the operation of power supply used for X ray. **07**
(b) Describe the DSP control of power supply. **07**

- Q.4** (a) Explain the PFC converters utilizing DCM operation. **07**
(b) What are the effects of non linear loads on power quality? **07**

OR

- Q.4** (a) With simple sketches, describe the working of a coreless type induction heating & state the advantages of coreless type induction heating. **07**
(b) Discuss following application of dielectric heating: **07**
(1) Heating of raw plastic (2) Gluing of wood (3) food processing

- Q.5** (a) Explain the basic operation of DSP control of active power filter. **07**
(b) Describe the operation of power supply for steel camera. **07**

OR

- Q.5** (a) Discuss harmonic distortion limits for voltage and current in conformance with IEEE 519:1992. **07**
(b) Describe Selective Harmonics Elimination Modulation (SHEM) technique using 3 levels BVS STATCOM. **07**
