

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**M. E. - SEMESTER – I • EXAMINATION – WINTER • 2014**

**Subject code: 2714505****Date: 12-01-2015****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) What is power quality? Discuss the various issues related to power quality. **07**  
(b) Explain the concept of non linear loads with respect to power conditioning. **07**

- Q.2** (a) Discuss a case study of Digital Signal Processing control of power supply in active filters. **07**  
(b) Discuss the advantages and applications of hybrid filters. **07**

**OR**

- (b) Discuss the various topologies of active filters in brief. **07**
- Q.3** (a) Why does a static condenser differ from synchronous condenser. Explain the STATCON in details with diagram. **07**  
(b) Explain the phenomena of power exchange between STATCOM and an AC System connected to it. **07**

**OR**

- Q.3** (a) Explain the full bridge converter with diagram and waveform. **07**  
(b) Write a short note on harmonic distortion limit as per IEEE 519-1992 standards. **07**

- Q.4** (a) Explain the voltage mode control and current mode control of SMPS. **07**  
(b) Explain the design of magnetic component of SMPS. **07**

**OR**

- Q.4** (a) Compare on-line and off-line UPS. Describe the operation of on-line UPS systems with diagram. **07**  
(b) What is redundancy in UPS? Explain the parallel redundancy. **07**

- Q.5** (a) Explain the working principle of high frequency induction heating with diagram **07**  
(b) Explain in details about the power supply for X-Ray equipments. **07**

**OR**

- Q.5** (a) Write a short note on push pull converter. **07**  
(b) Enlist the various power conditioners and state their limitations. **07**

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