

GUJARAT TECHNOLOGICAL UNIVERSITY**ME Semester –III Examination Dec. - 2011****Subject code: 730701****Date: 05/12/2011****Subject Name: Power Quality Management****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) Define and technically describe following terms: **07**
- (1) Linear loads
 - (2) Inrush current
 - (3) Power factor (displacement)
 - (4) Voltage swell
 - (5) Transient

- (b) What are the power quality standards? Discuss responsibilities of supplier and user of electrical power with respect to power quality **07**

- Q.2** (a) Discuss the criteria of voltage tolerance. **07**
- (b) Discuss “switching of loads” and “interruption of fault currents” as causes of transients. **07**

OR

- (b) Discuss significance of power factor correction with power quality point of view. **07**

- Q.3** (a) Explain various loads which are responsible for introduction of harmonics in the system. **07**
- (b) A 3 phase, 50 Hz, 10 kW induction motor has a power factor of 0.7(lag). A delta connected capacitor bank is connected across the supply to raise the power factor to 0.85(lag). Calculate the rating of capacitors connected in each phase. **07**

OR

- Q.3** (a) A 10 MVA transformer is loaded to 90% at a power factor of 0.85(lag). Determine the necessary leading KVAR to correct the power factor to 0.95(lag). If the transformer has a rated conductor loss of 1.0% of the transformer rating, transformer operates round the clock at the operating load and the energy charges are Rs. 5/KWH, estimate the annual saving. **07**

- (b) Explain single point and multipoint grounding. **07**

- Q.4** (a) With a case study explain the fatal effect which may result due to loss of grounding. **07**

- (b) Prepare technical note on harmonic filters. **07**

OR

- Q.4** (a) Explain high frequency interference. **07**

- (b) Write a short note on static VAR compensators. **07**

- Q.5** (a) What is distributed generation? Elaborate its effect on the power quality issues. Briefly explain methods of distributed generation. **07**

- (b) Discuss the application of transient –disturbance analyzers. **07**

OR

- Q.5** (a) Discuss health concerns of EMI (electromagnetic interference). **07**

- (b) Write short note on true RMS meter. **07**
