

GUJARAT TECHNOLOGICAL UNIVERSITY**M. E. - SEMESTER – III • EXAMINATION – WINTER • 2013****Subject code: 730701****Date: 26-11-2013****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: 7
(1) Linear loads
(2) Voltage sag
(3) Power factor (displacement)
(4) Voltage swell
(5) Flicker
- (b)** Discuss the examples of poor power quality issues in brief. 7
- Q.2 (a)** Discuss “switching of loads” and “interruption of fault currents” as causes of transients. 7
- (b)** Prove that third harmonic is in phase and have zero displacement angles between them. 7
- OR
- (b)** Define, displacement power factor and true power factor. List the methods of power factor improvement techniques and explain the static VAR Compensator also state the advantages of power factor corrections. 7
- Q.3 (a)** Explain various loads which are responsible for introduction of harmonics in the system. 7
- (b)** What is an arc furnace? Explain with suitable diagrams arc furnace can produce large voltage sags in electrical network. Also explain starting/stopping of capacitors banks in conjunction with an arc furnace operation. 7
- OR
- Q.3 (a)** What is distributed generation? Elaborate its effect on the power quality issues. Briefly explain methods of distributed generation. 7
- (b)** With a case study explain the fatal effect which may result due to loss of Grounding. 7
- Q.4 (a)** Write a short note on static VAR compensators. 7
- (b)** How neutral conductor is selected for the site where many computers are used? Discuss the possible solution of neutral conductor overloading. 7
- OR
- Q.4 (a)** List various power quality measuring devices and discuss the main features of power quality analyzer? Explain instrument setup procedure to measure power quality events. 7
- (b)** What do you mean by harmonics? How harmonics are generated in power system network? Support your answer with suitable example. 7

- Q.5 (a)** Discuss significance of power factor correction with power quality point of view. 7
- (b)** Write short note on true RMS meter. 7
- OR
- Q.5 (a)** What is the importance of the value of earth's resistance? Describe the fall of potential methods for measurement of earth's resistance. 7
- (b)** Explain the following with suitable diagrams 7
- (i) Off line UPS (ii) On line UPS (iii) Rotary UPS units.
