

Registration No:

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Total Number of Pages : 02

M.TECH

M.TECH 2<sup>ND</sup> SEMESTER REGULAR EXAMINATIONS, MAY 2018

POWER QUALITY MANAGEMENT

Branch: PE, Subject Code:MPEPE2051

Time: 3 Hours

Max Marks : 70

**PART-A****(10 X 2=20 MARKS)****1. Answer the following questions.**

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|--|------|
| a. Explain impulsive transient.  | CO-1 |
| b. What are the various methods to improve voltage sags in utility system?               | CO-1 |
| c. Write any two advantages of The SMES-based system over battery-based UPS systems.     | CO-2 |
| d. Define Fuse. Write two basic kinds of fuses?  | CO-2 |
| e. Explain the method adopted in practice for locating harmonic sources?                 | CO-4 |
| f. What is the reason for existence of harmonic distortion?                              | CO-4 |
| g. What is power conditioning and why it is needed?                                      | CO-5 |
| h. How voltage sag can be mitigated.   | CO-3 |
| i. What is the effect on transformer due to harmonics?                                   |      |
| j. Mention the Instruments used for the analysis of non-sinusoidal voltage and currents? | CO-5 |

**PART-B****(5 X 10=50 MARKS)****Answer any five questions from the following.**

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|---|----------|
| 2. a. What are the most common Power Quality problems? Explain them.  | [5] CO-1 |
| b. What are the different voltage sag mitigation techniques? Explain in detail?   | [5] CO-1 |
| 3. a. What is voltage swell? What are the causes of voltage swell and interruption?   | [5] CO-2 |
| b. What are the methods to be adopted for motor starting to reduce voltage sags during starting?  | [5] CO-1 |
| 4. A sinusoidal voltage source of $V(t) = 100\cos 377t$ volt is applied to a nonlinear load, resulting a non-sinusoidal current of the form<br>$i(t) = 8 + 15\cos(377t + 30^\circ) + 6\cos(2 \times 377t + 45^\circ) + 2\cos(3 \times 377t + 60^\circ)$ Amp.<br>Determine |          |
| a) Power absorbed by the load & Power factor of the load  | [5] CO-4 |
| b) Distortion factor (DF) & THD of load current   | [5] CO-4 |

5. a. Write five analog equipments used for power quality measurement. [5] CO-5  
b. Write short notes on Unified Power Quality Conditioners. [5] CO-5
6. a. Explain different terms associated with Power Quality. [5] CO-1  
b. What is the importance of the concept “Area of Vulnerability” with reference to power system, Explain. [5] CO-2
7. a. Outline the different methods to reduce harmonics in a power network. [5] CO-4  
b. Write short notes on Active power filter. [5] CO-5
8. Write short notes on  
a. CBEMA Curve CO-1  
b. Causes of voltage sag. CO-1

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