

Code No: D0709

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M.Tech II - Semester Examinations, March/April 2011

POWER QUALITY
(ELECTRICAL POWER SYSTEMS)

Time: 3hours

Max. Marks: 60

Answer any five questions
All questions carry equal marks

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1. Draw the following waveforms and write IEEE specifications for each
(i) Voltage sag (ii) Voltage swell (iii) Voltage Interruption (iv) Over Voltage
(v) Surges and (vi) Voltage fluctuation. [12]
2. a) Differentiate between long interruption and short interruptions of the power system networks [4]
b) Compare the results and observation and reliability analysis of power system network. [4]
c) Mention and explain the limits of the interruption frequency and interruption duration of a power system network. [4]
3. a) Derive the expression for the voltage between the faulted phases in case of phase – to – phase fault of a power system network. [6]
b) Obtain an expression for the characteristic magnitude and phase angle jump of the voltage in the faulted phase at the PCC in case of single phase fault. [6]
4. a) Write the voltage tolerance ranges of the following equipment and also explain the procedure to calculate the voltage tolerance ranges. [6]
i) Personal computer (ii) 5h.p ac drive (iii) PLC
b) Explain the mitigation of voltage sag in case of AC drive and adjustable DC drives. [6]
5. a) Name any four mitigation methods used in power system networks to improve the power quality. [6]
b) Explain in detail, how will the reduction in number of faults in a power system network improve the power quality. [6]
c) Draw a schematic diagram of series voltage controller and write the principle of operation. [6]
6. a) Explain in detail the unbalanced sags and their effects on the performance of the power system network. [6]
b) Mention the fault-clearing times of various protective devices used in power system network. [3]
c) Draw the waveform of regulated and non regulated dc voltage for a personal computer. [3]
7. a) What is single phase tripping? And why is a single phase tripping rarely used in low and medium voltage systems? [6]
b) Explain various mitigation methods of DC drives. [6]
8. Write short notes on:
a) Voltage sag calculations in non-radial system.
b) Combined shunt and series controller. [12]
