

Department of Electrical and Electronics Engineering

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UNIT I-INTRODUCTION

PART – A

1. Define power quality .
2. What are the commonly used terms that describe the parameters of electrical power that describe or measure power quality.
3. What is the most common power quality problem.
4. What is the second most common power quality problem.
5. What type of equipment is affected by power quality issues.
6. What are the types of power quality solutions available on the market today.
7. How can power quality problems be detected.
8. What are harmonics.
9. How do harmonics affect the electrical system.
10. How do harmonics affect the load.
11. How do you measure power quality?
12. Why is power conditioning needed?
13. What types of equipment are affected by power line noise?
14. Why are these transients or noise on the power line causing problems now?
15. What represent quality of power?
16. What are the power quality issues?
17. Classify power quality events in short duration events.
18. How a capacitor switching leads to overvoltage?
19. Draw the CBEMA curve.
20. What are the drawbacks of overloading?

PART - B

1. What are the major power quality issues and explain them.
2. Explain power quality and explain the reasons for increased concern in power quality.
3. Explain the various types of power quality disturbances.
4. Explain the impacts of power quality.
5. Discuss in detail about sags and swells.
6. Discuss in detail about transients.
7. Define waveform distortion and explain the waveform distortion categories.
8. Explain total harmonic distortion and total demand distortion.
9. With a waveform sketch , explain the terms.
 - (i)Voltage sag
 - (ii)Voltage interruption
 - (iii)Voltage swells
 - (iv)Sag with harmonics.
10. Explain the CBEMA and ITI curve.

UNIT II- VOLTAGE SAGS AND INTERRUPTIONS

PART – A

1. What is voltage sag?
2. When sag leads to interruption.
3. What are the causes of sag?
4. What are the three levels of possible solutions to voltage sag and momentary interruption problems?
5. List some industry standards associated with voltage sags.
6. What are the sources of sags and interruption?
7. Give some economic impacts due to sag.
8. What is the importance of estimating sag performance?
9. What are the various factors affecting the sag magnitude due to faults at a certain point in the system.
10. Name the different motor starting methods.
11. What are the causes for voltage sags due to transformer energizing?
12. How voltage sag can be mitigated.
13. Name the three levels of possible solutions to voltage sag and momentary interruption problems.
14. Name any four types of sag mitigation devices.
15. Define Dynamic Voltage Restorer (DVR).
16. What is the important role of a DVR?
17. Define active series compensation devices.
18. What is the need of DSTATCOM?
19. What is the main function of DSTATCOM?
20. What is the role of SSTS?

PART - B

1. Discuss the sources of sags and interruption.
2. Discuss in detail about the sag performance evaluation indices.
3. Explain the sag performance evaluation methods.
4. Explain the various causes and effects of voltage sags.
5. What are the different voltage sag mitigation techniques? Explain in detail.
6. Discuss in detail about the active series compensator.
7. Explain the solid state transfer switch with the transfer operation.
8. Discuss about estimating the cost of voltage sag events.
9. Explain the different compensation schemes to mitigate voltage sags.
10. Explain short duration and long duration voltage variation.

UNIT III – OVER VOLTAGE TRANSIENTS

PART - A

1. What are the various factors affecting the sag magnitude due to faults at a certain point in the system?
2. Define impulsive transients with suitable example.
3. List the important types of arrester used in protection of cables.
4. Differentiate between linear loads and non linear loads.
5. When does voltage sag lead to interruption?
6. Define transient over voltages.
7. What are the types of transient overvoltages?
8. Give examples for oscillatory transient over voltages.
9. What is the effect of capacitor switching transients on network?
10. What are the causes of voltage magnification on network?
11. Define voltage magnification phenomena?
12. Mention the two important concerns for capacitor bank switching transients.
13. Give the various aspects of equipment specific design and protection issues for the capacitor switching transients.
14. What specify the IEEE standard for shunt power capacitors causing transient overvoltages?
15. What are the various Causes of overvoltages?
16. Give the basic principles of overvoltage protection of load equipments.
17. What is the need of surge arrestors?
18. Differentiate between transient voltage surge suppressors (TVSS) and surge arrestors.
19. Mention the types of surge arrestors
20. What is metal-oxide surge-arrester?

PART - B

1. What are transient overvoltages? Explain the different types of transient overvoltages.
2. What are the different sources of transient overvoltages? Discuss the Capacitor switching transient.
3. Define lightning? Discuss in detail about the overvoltages due to lightning and the problems associated with it.
4. Explain the phenomena of ferroresonance.
5. What is the need for protection against overvoltages? What are the basic principles of overvoltages protection of load equipments?
6. Explain in detail about various methods to mitigate voltage swells
7. Explain in detail about the surge arrestors and surge suppressors.
8. What are the advantages of surge arrestors? Discuss about the application module.
9. Explain active series compensators for suppression of voltage sag.
10. What are the different sources of under voltages and sags? Describe.

UNIT IV- HARMONICS

1. What are the important concepts to bear in mind to understand power system harmonics?
2. Draw the relationship between between P, Q, S in sinusoidal condition.
3. Define true power factor.
4. What is the reason for existence of harmonic distortion?
5. Differentiate between linear loads and non-linear loads.
6. . What is voltage and current distortion?
7. Mention the commonly used indices used for measuring harmonic component of waveform.
8. Mention at least two causes of harmonics made on distribution systems
9. What is harmonic index? State its significant
10. Mention the problems created by harmonics.
11. Mention the harmonic effects on devices and loads Insulation stress (voltage effect)
12. What is the effect on transformer due to Harmonics?
13. Mention he harmonic sources from commercial loads.
14. Mention the harmonic sources from industrial loads .
15. What is the advantage of three phase converter?
16. What is the disadvantage of 12 pulse drive?
17. State the different types of inverters
18. What is Variable Voltage Inverter?
19. What is current Source inverter?
20. What is the need of locating harmonic sources?

PART B

1. Explain briefly about fundamentals of harmonics generation and wave form distortion.
2. Explain in detail about classification of linear loads and non linear loads used in harmonic studies.
3. Explain the concept of harmonic phenomena under the presence of harmonic producing loads.
4. Explain for the following terms (i) Harmonic distortion (ii) Current distortion (iii) Voltage distortion
5. What are the two important harmonic indices used in power system? Explain about it briefly.
6. Give the power definitions under non sinusoidal conditions. Explain briefly about it.
7. Differentiate between true power factor and displacement power factor under harmonic studies.
8. Explain briefly about various harmonic characterization on power systems.
9. Explain briefly about the phenomena of how current distortion affects the voltage distortion under the presence of harmonics.
10. What are the general causes of harmonics in power system?

UNIT V-POWER QUALITY MONITORING

PART A

1. . What is the importance of power quality monitoring?
2. What are the monitoring objectives?
3. What are the purposes of power quality monitoring system?
4. What is proactive monitoring?
5. What are the steps involved in power quality monitoring?
6. What are the requirements of monitoring for a voltage regulation and unbalance?
7. What are the requirements of monitoring for a harmonic distortion?
8. What are the Characteristics of power quality monitoring equipment?
9. What is Harmonic Analysis
10. What are the Characteristics of power line monitors?
11. What is the Types of power quality measurement equipment?
12. Mention the factors that should be considered for selecting the instrument.
13. What is the use of oscilloscope?
14. What is the use of spectrum analyzer?
15. What is the use of simple single phase hand-held power quality monitor?
16. Mention the Instruments used for the analysis of non-sinusoidal voltage and currents?
17. Mention the basic categories of instruments for harmonic analysis?
18. What is Spectrum analyzer?
19. What is the operation of spectrum analyzer?
20. What is Swept heterodyne technique?

PART B

1. Discuss in detail about the selection of power quality monitoring sites.
2. Explain the steps involved in power quality monitoring. What are the information from monitoring site surveys?
3. Bring out the important characteristics of power quality variation~.
4. Write short notes on power quality measurement system. What are the characteristic of power quality measurement equipments?
5. Write notes on power line disturbance analyzer.
6. What are the various instruments used for power quality measurements? What are the factors to be considered when selecting the instruments?
7. Discuss in detail about the instruments used for analyzing non sinusoidal voltage and currents.
8. Explain Harmonic/Spectrum analyzer.
9. Define voltage flicker. Discuss some of the flicker sources. Write notes on common methods for mitigation of flicker.
10. Discuss in detail about the flicker meter.