Code No: **RT42023A** **R13** **Set No. 1**

IV B.Tech II Semester Regular/Supplementary Examinations, April/May - 2019

ELECTRIC POWER QUALITY

(Electrical and Electronics Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B

Answer ALL sub questions from Part-A

Answer any THREE questions from Part-B

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PART–A *(22 Marks)*

1. a) Define power quality. [4]
   b) Mention any two sources of transient over voltages. [3]
   c) Give and explain the formula for voltage rise by the end user from the installation of capacitors. [4]
   d) Define TDD and give its formula. [4]
   e) Mention any two advantages of DG. [3]
   f) Mention the function of In-plant power monitor. [4]

PART–B *(3x16 = 48 Marks)*

2. a) Explain about voltage imbalance and waveform distortion. [8]
   b) Discuss about inter-harmonics and notching. [8]

3. a) Discuss about Surge arresters and transient voltage surge suppressors. [8]
   b) Explain about Isolation transformers and give its uses. [8]

4. a) Discuss about utility voltage regulator application. [8]
   b) Explain about flicker and its effect on voltage quality. [8]

5. a) Explain about the various sources of harmonics from industrial loads. [8]
   b) Discuss the effect of harmonics on system impedance. [8]

6. a) Explain about any two DG technologies. [8]
   b) Discuss the operation of DG in Low Voltage distribution networks. [8]

7. a) Discuss about application of intelligent systems PQ monitoring. [8]
   b) Explain about disturbance analyzers and flicker meters used in power quality measurement. [8]

Code No: **RT42023A** **R13** **Set No. 2**

IV B.Tech II Semester Regular/Supplementary Examinations, April/May - 2019

ELECTRIC POWER QUALITY

(Electrical and Electronics Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B

Answer ALL sub questions from Part-A

Answer any THREE questions from Part-B

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PART–A *(22 Marks)*

1. a) Mention any two reasons for power quality problems. [4]
   b) Write any two principles of overvoltage protection of load equipment. [3]
   c) Write the formula for losses reduction in power system from the installation of capacitors. [4]
   d) Define THD and give its formula. [4]
   e) Mention any two disadvantages of DG. [3]
   f) Mention the function of voltage recorder. [4]

PART–B *(3x16 = 48 Marks)*

2. a) Explain about short duration voltage variations. [8]
   b) Discuss about voltage fluctuations and explain the causes of it. [8]

3. a) Explain about low-pass filters and where they are used. [8]
   b) Discuss about low-impedance power conditioners. [8]

4. a) Explain about ferroresonant transformers used for voltage regulation. [8]
   b) Discuss the use of distributed resources in utility voltage regulation. [8]

5. a) Discuss about the power system quantities under non-sinusoidal conditions. [8]
   b) Explain about the various sources of harmonics from commercial loads. [8]

6. a) Explain how DG's are interfaced to the utility system. [8]
   b) Discuss about the operating conflicts occurring due to deployment of DG in utility system. [8]

7. a) Explain about assessment of PQ measuring data. [8]
   b) Explain about multi-meters and energy monitors used in power quality measurement. [8]

Code No: **RT42023A** **R13** **Set No. 3**

IV B.Tech II Semester Regular/Supplementary Examinations, April/May - 2019

ELECTRIC POWER QUALITY

(Electrical and Electronics Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B

Answer ALL sub questions from Part-A

Answer any THREE questions from Part-B

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PART–A *(22 Marks)*

1. a) What are the effects of power quality? [4]
   b) Define minimum voltage sag ride-through capability. [3]
   c) Write the formula for percent line current reduction in power system from the installation of capacitors. [4]
   d) What are triplen harmonics? [4]
   e) Mention various DG technologies available for power generation. [3]
   f) Mention the function of DFR. [4]

PART–B *(3x16 = 48 Marks)*

2. a) Explain about long duration voltage variations. [8]
   b) Discuss about power frequency variations and the causes of it. [8]

3. a) Explain about utility surge arresters. [8]
   b) Discuss about sources of sags and interruptions. [8]

4. a) Explain about magnetic synthesizers used for voltage regulation. [8]
   b) Discuss about end-user capacitor application and give its usages. [8]

5. a) Discuss parallel resonance from harmonics perspective. [8]
   b) Explain the effects of harmonics on motors and energy metering devices. [8]

6. a) Explain how power quality issues are solved by the placement of DG's. [8]
   b) Discuss about the methods available for interfacing DG technology with utility system. [8]

7. a) Explain about combination disturbance and harmonic analyzers used in power quality measurement. [8]
   b) Discuss about permanent power quality monitoring equipment. [8]

Code No: **RT42023A** **R13** **Set No. 4**

IV B.Tech II Semester Regular/Supplementary Examinations, April/May - 2019

ELECTRIC POWER QUALITY

(Electrical and Electronics Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B

Answer ALL sub questions from Part-A

Answer any THREE questions from Part-B

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PART–A *(22 Marks)*

1. a) List the steps involved in power quality evaluation. [4]
   b) Mention any two sources of voltage sags in power systems. [3]
   c) Give the formulae for displacement and true power factor. [4]
   d) What are harmonic phase sequences? [4]
   e) What are the main types of electrical system interfaces? [3]
   f) What are the various power quality monitoring considerations? [4]

PART–B *(3x16 = 48 Marks)*

2. a) Explain the general classification of power quality problems. [8]
   b) Discuss about impulsive and oscillatory transients and why they exist. [8]

3. a) Explain about Utility Capacitor-Switching Transients. [8]
   b) Discuss about sources of transient over voltages and also the effects of it. [8]

4. a) Explain about MG sets and SVC used for voltage regulation. [8]
   b) Explain the use of capacitors for improving voltage regulation of a transmission line. [8]

5. a) Discuss series resonance from harmonics perspective. [8]
   b) Explain the effects of harmonics on capacitors and transformers. [8]

6. a) Explain the effect of DG w.r.t operating conflicts. [8]
   b) Discuss about the power quality issues affected by DG. [8]

7. a) Explain about harmonic analyzers and spectrum analyzers used in power quality measurement. [8]
   b) Discuss about power quality monitoring considerations and its uses. [8]