INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

QUESTION BANK

Course Name	:	Power Quality
Course Code	:	BPE210
Class	:	I - M. Tech IISem
Branch	:	EEE
Year	:	2015 – 2016
Course Faculty	:	Dr.P.MALLIKARJUNA SARMA

Group – I QUESTION BANK ON SHORT ANSWER QUESTION

S.No	QUESTION	BLOOMS TAXONOMY LEVEL	COURSE OUTCOME
	UNIT-I INTRODUCTION		
1	Explain various power quality issues from the consumer point of view	Evaluate	1
2	Do you agree with the statement " Power quality is the same as voltage	Remember	1
3	Why should power engineer concern him self about power quality	Remember	1
4	Discuss the procedure for evaluating power quality	Remember	1
5	Discuss contribution of single phase and three phase static and	Remember	1
6	What is total harmonic distortion? Discuss how power electronic	Remember	1
7	Discuss in detail about nonlinear loads and how they cause	Understand	1
8	Discuss power quality issues	Remember	2
9	Distinguish between voltage sags and swells	Remember	1
10	Distinguish between power outages and interruptions	Remember	1,2
12	Distinguish between voltage fluctuation and voltage unbalance	Understand	1
13	What is the difference between harmonics and interharmonics		
Group – II QUESTION BANK ON LONG ANSWER QUESTIONS			
1	What is the impact of low power Quality on end user	Analyze	2
3	Discuss various standards followed on power quality	Analyze	2
4	How is power quality monitored	Remember	1

5	Explain operation of SVC? Explain how transient free switching is achieved in SVC	Remember	1
6	Explain operation of TCR with the help of a diagram	Understand	2
7	Explain the operation of static VAR compensator with details about each component	Evaluate	1
8	Explain the operation of with details about each component of TCR and its operation	Understand	2
9	Explain the operation of with details about each component of STATCOM and its operation	Evaluate	2
10	Explain the operation of with details about each component of FC-TCR and its operation	Remember	1
11	Explain the operation of with details about each component of DSTATCOM and its operation	Evaluate	2
12	Explain the operation of with details about each component of Network reconfiguration type custom devices and their operation	understand	1
13	Distinguish between the operation of STATCOM and DSTATCOM	Evaluate	1
14	Distinguish between the operation of DVR and DSTATCOM	Evaluate	2
	Group – I QUESTION BANK ON SHORT ANSWER QUESTION **UNIT-II** **NON LINEAR LOADS**		
1	is a single phase static AC to DC converter a linear load?	Analyze	2
2	What is total harmonic distortion? Discuss how power electronic drives contribute to its increase.	Understand	1
3	What is a nonlinear loads and how they cause waveform distortion	Remember	2
4	What are the power quality issues arising out of the operation of AC drives	Analyze	1
5	Discuss contribution of single phase and three phase static and rotating AC to DC converters to harmonic distortion	understand	2
6	is a single phase rotating AC to DC converter a linear load?	Understand	1
7	What are power quality issues arising out of battery chargers	understand	2
8	Why can we not allow voltage fluctuations in a computer center	Analyze	1

9	Why industrial loads are sensitive to voltage fluctuations	understand	2
10	What is meant by notching?	Analyze	1
	Group – II QUESTION BANK ON LONG ANSWER QUESTIONS		
1	Discuss contribution of single phase and three phase static and rotating AC to DC converters to harmonic distortion	Evaluate	2
2	What is total harmonic distortion? Discuss how power electronic drives contribute to its increase.	Analyze	1
3	Discuss in detail about nonlinear loads and how they cause waveform distortion	Evaluate	2
4	Discuss in detail about the power quality issues arising out of the operation of power converters	understand	1
5	Discuss in detail about various standards applicable to power quality	Analyze	2
6	What is total harmonic distortion(THD) Discuss how various nonlinear	understand	1
7	Discuss in detail about power electronic loads and how they cause waveform distortion	Understand	2
8	Discuss how unbalance arises in system voltages? How unbalance can be mitigated	Analyze	1
9	Discuss how dc offset arises in system voltages? How it can be mitigated	Understand	2
10	Discuss how power frequency variation affects industrial loads? What are its causes ?How can frequency variation be avoided?	Understand	1
11	What are the various disturbances that may occur in supply voltage? Discuss in detail.	understand	2
	Group – I QUESTION BANK ON SHORT ANSWER QUESTION **UNIT-III** **MEASUREMENT AND ANALYSIS METHODS**		
1	What are various mrthods of measuring high voltages	understand	3
2	What are various mrthods of measuring high currents	Understand	2
3	How do you measure power factor	Remember	2
4	What are various types of power factor? Which one is used under distorted conditions	Analyze	3
5	What is an event recorder? How is it useful in analyzing a fault post facto?	understand	2

6	What are the applications of Hartley transform in analyzing power quality	understand	1
7	What are the applications of Fourier transform in analyzing power quality	Analyze	2
8	What are the applications of wavelet transform in analyzing power quality	understand	3
9	What are the applications of Walsh transform in analyzing power quality	understand	2
10	What are the applications of Laplace transform in analyzing power quality	Analyze	2
	Group – II QUESTION BANK ON LONG ANSWER QUESTIONS		
1	Explain how high values of AC and DC voltages and currents are measured for the purpose of power quality evaluation :	Evaluate	3
2	How is the power factor of a load is measured. How can power	Remember	2
3	Discuss relative merits and demerits of using Wavelet Transforms and Walsh Transforms in analyzing power quality	Understand	1
14	What is meant by characterization of power quality disturbance and how frequency domain methods are used to arrive at it.	Evaluate	3
5	Explain how high values of AC and DC voltages are measured:	Understand	2
6	How is the power factor measured in a power system. How does low power Factor impact power quality.	Analyze	1
7	Discuss relative merits and demerits of using Fourier Transforms and Wavelet Transforms in analyzing power quality	Understand	3
8	What is meant by characterization of power quality disturbance and how DFT is used to achieve it.	Evaluate	2
9	Discuss the characteristics of impulvive transients and oscillatory transients and their origin	Understand	2
10	Distinguish between voltage sag and swell,discuss various short duration voltage variations	Understand	3
11	Discuss various long duration voltage variations	Analyze	2
12	Discuss the distinction between interruption, outage and blackout	Remember	3

13	Discuss about CBEMA power acceptability curves	Understand	3
14	What are the implications of low power factor to utility and to industry	Analyze	2
15	What are the various time domain methods in analyzing power quality disturbances	Understand	3
16	What are the various frequency domain methods applicable to analyze powerquality disturbances	Analyze	2
17	What are the various applications of Fourier transforms in analyzing power quality	Remember	3
Group – I QUESTION BANK ON SHORT ANSWER QUESTION UNIT IV ANALYSIS AND CONVENTIONAL MITIGATION METHODS			
1	Define System Average Interruption frequency index	Remember	4
2	Define Consumer Average Interruption frequency index	Remember	4
3	Define System Average Interruption Duration index	Remember	4
4	Define momentary Average Interruption frequency index	Understand	4
5	Define voltage sag energy	Analyze	4
6	How do you use symmetrical components and phasor quantities	Analyze	4
7	What is fundamental quantity extraction	Understand	4
8	How do you use Detroit Edison Sag score	Analyze	4
9	Explain voltage sag lost energy index	Understand	4
10	What is voltage sag energy	Analyze	4
11	What is open loop balancing	Understand	4
12	What is closed loop balancing	Analyze	4
Group – II QUESTION BANK ON LONG ANSWER QUESTIONS			
1	Discuss various ways of analyzing unbalance	Evaluate	4
2	Distinguish between symmetrical components of phasor quantities and instantaneous symmetrical components	Evaluate	4

3	Compare various analysis techniques like Discrete Fourier Transform,Short Time Fourier Transform and Discrete Wavelet Transform in characterizing power quality disturbances.	Evaluate	4
4	Describe how an impulsive transient disturbance is characterized in time domain	Remember	4
5	Discuss what is meant by voltage sag and swell	Evaluate	4
6	What is the application of Detroit Edison sag score?	Evaluate	4
7	What is meant by voltage sag energy	Understand	4
8	Discuss how the concept of voltage sag lost energy index (VSSEI) is applied.	Understand	4
9	What is classical load balancing problem?Distinguish between closed loop balancing and open loop balancing	Understand	4
10	What is flicker and how is it analyzed and quantified.Discuss the instruments for measuring the same and standards applicable	Understand	4
11	Discuss how current balancing is achieved and what are the equipments used for the same	Understand	4
12	What are the varios techniques used for harmonic reduction and sag reduction	Understand	4
Group – I QUESTION BANK ON SHORT ANSWER QUESTION **UNIT V** **POWER QUALITY IMPROVEMENT**			
1	List out the Custom power devices	Remember	5
2	What is UPQC	Remember	5
3	Explain the function of solid state current limiter	Remember	5
4	Explain the function of solid state breaker	Remember	5
5	Explain the function of solid state transfer switch	Analyze	5
6	Explain the function of dynamic voltage restorer	Understand	5
7	Explain the function of distribution STATCOM	Analyze	5
8	Explain the classification of customers into grade A, AA and AAA	Understand	5
9	How to deal with a polluting source causing power qyality problems to other consumers	Analyze	5
10	What are the devices that can be used to reduce THD	Analyze	5

Group – II QUESTION BANK ON LONG ANSWER QUESTIONS			
1	What are custom power devices and custom power parks?	Analyze	5
2	Discuss how capacitor banks and tuned filters are used to mitigate harmonics?	Understand	5
3	Discuss various devices used for mitigating power quality issues	Analyze	5
4	Explain control strategies applicable to DVR	Analyze	5
5	Describe how load compensation is achieved using DSTATCOM	Understand	5
6	Discuss Utility customer interface	Analyze	5
7	Discuss how passive harmonic filters are used to mitigate harmonics?	Understand	5
8	Discuss the importance of custom power devices in mitigating power quality issues	Analyze	5
9	Explain control strategies applicable to UPQC	Analyze	5
10	Describe how sensitive loads are protected using DVR	Understand	5
11	How to identify the polluting load causing power quality problems	Analyze	5