



Registration No:

--	--	--	--	--	--	--	--	--	--

Total Number of Pages : 01

M.TECH

AR-19

M.TECH 1<sup>ST</sup> SEMESTER EXAMINATIONS NOV/DEC 2019

PE, MPEPE1033

POWER QUALITY

Time: 3 Hours

Max Marks : 70

The figures in the right hand margin indicate marks.

PART-A

(10 X 2=20 MARKS)

1. Answer the following questions.

- Define total demand distortion.
- What are the various power quality issues?
- Define power frequency variations?
- List any four standards available in power quality.
- Name any four IEC standards that define power quality.
- Define voltage fluctuation
- What are important harmonic introducing in SMPS?
- What is PFC based Bilateral Single Phase and Three Phase Converter?
- Write the advantages of Hamilton-Jacobi-Bellman equation.
- What is MRAS and write one application?

PART-B

(5 x 10 = 50 MARKS)

Answer any five questions from the following.

- (a) Explain the various types of power quality disturbances and impacts of power quality?  
(b) Explain briefly about fundamentals of harmonics generation and waveform distortion.
- (a) Discuss the following characteristics of power quality events  
(i) Short duration variations.  
(ii) Long duration variations  
(b) Discuss in detail about transients.
- (a) Discuss in detail about sags and swells.  
(b) Explain for the following related with Power quality.  
(i) Voltage imbalance  
(ii) Under voltage  
(iii) Over voltage  
(iv) Frequency variation
- (a) Define waveform distortion? Explain the waveform distortion categories  
(b) What is harmonics? Explain harmonic distortion with relevant waveforms.
- (a) Explain the modern power quality monitors  
(b) Draw and explain the functional structure of expert systems.
- (a) Draw the block diagram of advanced power quality monitoring systems. Explain it.  
(b) Explain the Modeling of networks and components under non-sinusoidal condition.
- (a) What are the various instruments used for power quality measurements? What are the factors to be considered when selecting the instruments?  
(b) Discuss in detail about the instruments used for analyzing non sinusoidal voltage and currents.