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Paper Id: 220208 **Roll No.** | | | | | | | | | | |

M TECH

(SEM II) THEORY EXAMINATION 2018-19

POWER QUALITY

Time: 3 Hours ***Total Marks: 70***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

a. What are the benefits of power quality monitoring?
b. What are the causes of voltage sags?
c. List the major electric power quality issues.
d. What are the reasons for voltage imbalances?
e. Define total harmonic distortion.
f. List the Write the need for power conditioners.
g. List the IEEE harmonic standard on harmonic distortion.

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

a. What are the major power quality issues? Explain in details.
b. Discuss some of the solutions for voltage sag and interruptions.
c. What are the reasons and effects of waveforms distortion on power quality?
d. Explain the working of an online UPS with the help of suitable diagram also point out its superiority over off line UPS.
e. Discuss power quality standards. Standard test waveform and their role.

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

(a) What are the causes of interruptions? What is the importance of interruptions?
(b) Illustrate the importance of power quality monitoring and assessment.

4. Attempt any *one* part of the following: 7 x 1 = 7

(a) Explain the following.
  (i) Active filters and passive filters.
  (ii) Best possible method of harmonic elimination
(b) What are the parameter that defines the quality of electrical power? Explain the term "Good power quality"

5. Attempt any *one* part of the following: 7 x 1 = 7

(a) Explain half controlled voltage regulator. Also explain following device used for voltage regulation-
  (i) Tap changer transformer
  (ii) Isolation devices with separate voltage regulator.
(b) Differentiate between power conditioner and UPS. Draw the circuit diagram of power conditioner.

6. Attempt any *one* part of the following: 7 x 1 = 7

(a) Write short notes on the following:
  (i) Harmonic analyzer (ii) Flicker meter.
(b) Define "Waveform distortion" Explain following types waveform distortions
  (i) Electrical noise (ii) Notching.
  (iii) DC-offset (iv) Brown out.

7. Attempt any *one* part of the following: 7 x 1 = 7

(a) What is the need of IEEE standards used in harmonics studies. Give their philosophy and objectives of these standards.
(b) What are static uninterruptible power supplies? Discuss the classification and types of UPS.