

**PARUL UNIVERSITY**  
**FACULTY OF ENGINEERING & TECHNOLOGY**  
**M.Tech., Winter 2017 - 18 Examination**

**Semester: 2**  
**Subject Code: 03203154**  
**Subject Name: Electrical Power Quality**

**Date: 11/01/2018**  
**Time: 02:00 pm to 04:30 pm**  
**Total Marks: 60**

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**Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

**Q.1** A) Define power quality and explain power quality progression. **(05)**

B) Define harmonics with suitable example and also discuss harmonic number. **(05)**

C) With respect to power quality terminology explain following  
(1) Distraction Factor (2) Form Factor (3) Nonlinear Load (4) Power Factor(Displacement) **(05)**  
(5) Power Factor (Total)

**Q.2** Answer the following questions. (Attempt any three) **(15)**

A) With using a diagram, explain voltage rise due to capacitance in electrical power systems.

B) Explain high frequency interference with location of ground plane or wire can affect noise pickup due to effective ground loop area.

C) Find the total harmonic distortion and individual harmonic distortion of a voltage waveform with the following harmonic frequency make up: Fundamental= $V_1=230V$ , 3rd harmonic= $V_3=8V$ , 5th harmonic= $V_5=4V$ , 7th harmonic= $V_7=3.5V$ , 9th harmonic= $V_9=2V$

D) List out different types causes of transients. Explain Interruption of fault currents and switching of capacitor banks causing transients.

**Q.3** A) Write a short note on power quality concerns with necessary diagram. **(07)**

B) List different susceptibility criteria and explain any three susceptibility criteria causes and effect. **(08)**

**OR**

B) What do you mean by power quality standards? List IEEE standards related to power quality. **(08)**

**Q.4** A) Describe harmonic phase rotation and phase angle relationship. **(07)**

**OR**

A) What is transient? Write a short note on transient system model. **(07)**

B) Explain Static VAR Compensators. **(08)**