**Seat No.: _____** **Enrolment No._____**

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–VIII (NEW) - EXAMINATION – SUMMER 2018**

**Subject Code: 2180911 Date: 30/04/2018**

**Subject Name: Power Quality and Management(Departmental Elective - III)**

**Time: 10:30 AM to 01:00 PM Total Marks: 70**

**Instructions:**

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Assume suitable data (if required).**

| | | | MARKS |
|---|---|---|---|
| **Q.1** | **(a)** | List the sources of harmonics in power system. | **03** |
| | **(b)** | Define following terms with suitable example<br>1.Non Linear loads 2.Inrush Current<br>3.Power Factor 4.Transient | **04** |
| | **(c)** | Name and explain different types of power quality issues that affect the power systems depending upon the severity? | **07** |
| **Q.2** | **(a)** | Discuss the sources of voltage sag. | **03** |
| | **(b)** | Explain the effect of voltage sag on power system. | **04** |
| | **(c)** | Explain the principle of DVR operation used for sag mitigation. | **07** |
| | | **OR** | |
| | **(c)** | Explain the single reference ground methods. | **07** |
| **Q.3** | **(a)** | What are the different sources of transient overvoltage? | **03** |
| | **(b)** | Discuss the Capacitor switching transient. | **04** |
| | **(c)** | Explain application of Ferro resonance transformer. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Find out value of capacitor in kVAR to improve the power factor of a 120kW Induction motor from 0.75 to 0.96. | **03** |
| | **(b)** | Write a note on harmonic analyzer. | **04** |
| | **(c)** | Explain effect of Harmonics on Transformer and Induction Motor. | **07** |
| **Q.4** | **(a)** | What is Electromagnetic Interference (EMI)? Describe main sources of EMI. | **03** |
| | **(b)** | Describe effect of EMI on power quality. | **04** |
| | **(c)** | Explain EMI mitigation methods in detail. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Differentiate grounding and bonding. | **03** |
| | **(b)** | Explain different schemes of grounding and bonding in power system in detail. | **04** |
| | **(c)** | Explain “Individual Harmonic Distortion” and “Total Harmonic Distortion” for harmonic analysis. | **07** |
| **Q.5** | **(a)** | What are the various instruments used for power quality measurements? | **03** |
| | **(b)** | What are the factors to be considered when selecting the instruments for power quality measurement? | **04** |
| | **(c)** | Explain in detail about surge arrester and surge suppressor for overvoltage protection. | **07** |

**OR**

| | | | |
|---|---|---|---|
| **Q.5** | **(a)** | What is Distributed Generation (DG)? | **03** |
| | **(b)** | Explain power quality issues with a system containing DG. | **04** |
| | **(c)** | Explain number of test locations & test duration for power quality measurement. | **07** |

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