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**B.TECH.** 

## **THEORY EXAMINATION (SEM-VIII) 2016-17**

# **POWER QUALITY**

### Time : 3 Hours

*Note* : *Be precise in your answer. In case of numerical problem assume data wherever not provided.* 

### SECTION – A

#### 1. **Explain the following:**

- What is Power Quality? (a)
- How can Power Quality problems be detected? **(b)**
- What are Harmonics? (c)
- **(d)** Mention the types of sag.
- **(e)** What is Voltage Sag?
- Name the different motor starting methods **(f)**
- Define transient over voltages **(g)**
- What is the need of surge arrestors? **(h)**
- **(i)** Define true power factor.
- State the different types of inverters (j)

### **SECTION – B**

#### 2. Attempt any five of the following questions:

- What would be the impact of "poor power quality" on system efficiency, reliability and (a) operation?
- Discuss the working principle of DSTATCOM. How load compensation can be done **(b)** using DSTATCOM.
- What are series and shunt compensator? Compare their role for power quality (c) improvement.
- What are the passive filters? Explain the factors to be considered for designing a **(d)** passive filter. Also explain their limitations.
- What are Power Conditioners? Explain working principle of Unified Power Quality **(e)** Conditioner (UPQC)?
- Distinguish between voltage sag and under voltage? Briefly discuss the techniques used **(f)** for sag or dip mitigation.
- What causes voltage imbalance in a system? What are its consequences? How is it **(g)** different from voltage fluctuation?
- **(h)** Enumerate the devices used to check the voltage related power quality in power system. Discuss any one of them in detail.

### **SECTION - C**

### Attempt any two parts of the following questions:

- What is the significance of neutral voltage? Under which conditions it suffers swings? What 3. can be done to prevent the same?
- What do you understand by harmonics? What are different types of harmonics? Explain the 4. different detrimental effects of harmonics with suitable examples.
- 5. What are the causes of interruptions? How do short duration interruptions differ from sustained interruptions? What is the importance of interruptions?

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 $10 \ge 2 = 20$ 

Max. Marks : 100

 $5 \ge 10 = 50$ 

# $2 \ge 15 = 30$

