**18EED41**

**Hall Ticket Number:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **IV/IV B.Tech (Regular/Supplementary) DEGREE EXAMINATION** | | | |
| **April,2023** | **Electrical & Electronics Engineering** | | |
| **Eighth Semester** | **Power Quality** | | |
| **Time:** Three Hours | | **Maximum: 5**0 Marks | |
| *Answer Question No. 1 Compulsorily.* | | | (10X1 = 10 Marks) |
| *Answer* ***ANY ONE*** *question from each Unit.* | | | (4X10=40 Marks) |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1. | a) | Define the power quality as per IEEE. | CO1(BL1) | | **1M** |
|  | b) | Classify power quality events in long duration variations | CO1(BL3) | | **1M** |
|  | c) | How can power quality problems be detected? | CO1(BL1) | | **1M** |
|  | d) | Voltage sag and interruption are very similar in nature. Explain. | CO2(BL2) | | **1M** |
|  | e) | List some industry standards associated with voltage sags | CO2(BL1) | | **1M** |
|  | f) | What is the effect of capacitor switching transients on network? | CO2(BL1) | | **1M** |
|  | g) | What is voltage and current distortion? | CO3(BL1) | | **1M** |
|  | h) | Compare linear loads and non-linear loads. | CO3(BL2) | | **1M** |
|  | i) | Why is power conditioning needed? | CO4(BL1) | | **1M** |
|  | j) | List out the advantages of shunt compensators | CO4(BL1) | | **1M** |
| **Unit - I** | | | | | |
| 2. | a) | Explain power quality and the reasons for increased concern in power quality | CO1(BL2) | **5M** | |
|  | b) | Discuss about short duration voltage variations | CO1(BL2) | **5M** | |
|  |  | **(OR)** |  |  | |
| 3. | a) | Illustrate power frequency variation with an example | CO1(BL2) | **5M** | |
|  | b) | Categorize various power quality phenomena | CO1(BL4) | **5M** | |
| **Unit - II** | | | | | |
| 4. | a) | Explain the concept of area of vulnerability in estimating voltage sag performance | CO2(BL1) | **5M** | |
|  | b) | Explain with a neat sketch fundamental principles of over voltage protection | CO2(BL2) | **5M** | |
|  |  | **(OR)** |  |  | |
| 5. | a) | Identify the role of surge arrester in overvoltage protection | CO2(BL3) | **5M** | |
|  | b) | Define lightning? Discuss in detail about the overvoltage due to lightning and the problems associated with it. | CO2(BL2) | **5M** | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Unit - III** | | | | |
| 6. | a) | What are the various classifications of harmonic sources and briefly explain any two sources. | CO3(BL1) | **5M** |
|  | b) | What are the different causes of harmonics and explain the effects of harmonics. | CO3(BL4) | **5M** |
|  |  | **(OR)** |  |  |
| 7. |  | Examine the role of active and passive filters in harmonic mitigation | CO3(BL4) | **10M** |
| **Unit - IV** | | | | |
| 8. | a) | Distinguish series and shunt compensators | CO4(BL4) | **5M** |
|  | b) | Explain the basic structure of UPQC | CO4(BL2) | **5M** |
|  |  | **(OR)** |  |  |
| 9. | a) | Explain the various control strategies of DSTATCOM | CO4(BL2) | **5M** |
|  | b) | List out the various advantages of using DVR in power quality improvement | CO4(BL1) | **5M** |

****