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Code No.: 7136 M

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.E. (CBCS : EEE) I-Semester Make up Examinations, March-2017**

**(Power Systems & Power Electronics)**

**Power Quality Engineering**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE from Part-B*

**Part-A (10 × 2 = 20 Marks)**

1. Why power electronic loads are major source of harmonic generation?
2. How current measurement is utilized to characterize the system disturbance?
3. What are the causes and effects of voltage flickers?
4. Differentiate between Sag C and Sag D.
5. Determine the capacitor size for the AC ASD against voltage sag.
6. What is the effect of voltage dip on operation of induction motor?
7. Explain the two harmonic indices used for measuring the harmonic content of a waveform.
8. What are interharmonics?
9. How transient over voltages are caused by switching?
10. What are the reasons for grounding?

**Part-B (5 × 10 = 50 Marks)**

11. a) Explain the long duration and short duration voltage variations. [4]  
b) What are the different standards of power quality monitoring? Also explain the on line assessment of power quality measurement data. [6]
12. a) What are the sources of sags and interruptions? [3]  
b) How the voltage sag magnitude is calculated on a radial system? Explain the factors which are affecting the sag. [7]
13. a) Discuss in detail the magnitude and phase angle jumps for three phase unbalanced sags. [5]  
b) Explain the methods of mitigating harmonics. [5]
14. a) Explain the harmonic sources from industrial loads with characteristics. [5]  
b) What is the impact of harmonic distortion on transformers? [5]
15. a) What are the typical wiring and grounding problems? [5]  
b) What are the sources for overvoltage transients? [5]
16. a) Describe five equipments utilized for power quality measurement and why? [5]  
b) Explain about different voltage sag characteristics. [5]
17. Answer any *two* of the following:  
a) Explain any five strategies for the solution to wiring and grounding problems. [5]  
b) Explain how different power system parameters are changed under non-sinusoidal conditions. [5]  
c) Explain the characterization of voltage sags experienced by three phase ASD systems. [5]