

Reg. No.....

Name.....

M.TECH DEGREE EXAMINATION

Model Question Paper -I

First Semester

Branch: Electrical and Electronics Engineering;

Specialization: Power Systems

MEEPE 105-3 POWER QUALITY

(2013 admission onwards)

[Regular/ Supplementary]

Time: Three hours

Maximum: 100 marks

Answer all questions

Each full question carries 25 marks

1. (a) What is meant by *power quality*? What are the basic power quality measures? (15 marks)
- (b) What is voltage swell? How it differs from over voltage? Explain any two reasons for voltage swell? (10 marks)
- Or
2. (a) What is meant by international power quality standards? Where are they used? Explain IEEE standard corresponding to harmonics. (10 marks)
- (b) Write briefly on
(i) Voltage flicker (ii) CBEMA curve (iii) TIF and DIN (15 marks)
3. (a) With a block diagram explain hybrid UPS. Compare it with online and offline UPS (10 marks)
- (b) Explain the impact of harmonic distortion on motors and transformers. (15 marks)
- Or
4. (a) Explain the sources of harmonics. (15 marks)
- (b) Draw the non-linear equivalent of a fluorescent lamp and estimate the current harmonics in fluorescent lamp circuits. (10 marks)

5. (a) What is the main source of causing resonance in power system? (10 marks)
- (b) A 2000 kVA, 13.8kV/480 V transformer with leakage reactance of 5% feeding a bus containing two 500 HP ASD. A 750 kVAR star connected capacitor bank installed on the 480 V bus for power factor correction. Analyse the conditions for resonance and verify the result by another method? (15 marks)

Or

6. (a) A 5 MVA transformer is loaded to 4.5 MVA at a power factor of 0.82 lag. Calculate the leading kVAR necessary to correct the power factor to 0.95 lag and also the corresponding rating of the transformer ? (15 marks)
- (b) Define SVC? What is the important role of SVC? (10 marks)
7. (a) Explain briefly about for the following harmonic filter.
(i)Active filters (ii)Passive filters (10 marks)
- (b) Explain in detail about principles of operation and control methods of shunt active filter with neat schematic. (15 marks)

Or

8. (a) What are the typical wiring and grounding problems? What are the solutions applied for wiring and grounding problems (15 marks)
- (b) Define Dynamic voltage restorer? What is the important role of DVR harmonic elimination? (10 marks)

[4 x 25 = 100 marks]