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M.TECH

Total Number of Pages :1

M.TECH 1ST SEMESTER REGULAR EXAMINATIONS, DECEMBER 2018

POWER QUALITY

Branch: PE, Subject Code:MPEPE1033

(Regulations 2018)

Time: 3 Hours

Max Marks : 70

Question Code: RD18002052

PART-A (10 X 2=20 Marks)

1. Answer the following questions.
 - a. How is over voltage different from swell?
 - b. Mention any two solutions against voltage sags?
 - c. Draw a typical voltage sag characteristics due to an induction motor starting by considering a time period of at least 200 cycles.
 - d. What do you mean by power conditioning, Why is it necessary?
 - e. How fault clearing time is reduced?
 - f. A 200-kVAR, 13.8-kV, Y-connected capacitor bank is connected at the end of a 25-mile transmission line with an inductive reactance of 0.5 Ohms per mile. Find the natural frequency of the current that would be drawn during turn on.
 - g. Explain the concept of constant capacitor voltage control mechanism and its application.
 - h. Explain the operation of single phase active filter.
 - i. How do harmonics affect the electrical system?
 - j. What are the types of power quality solutions available on the market today?

PART-B (5 X 10=50 Marks)

Answer any five questions from the following.

- 2 a. A distribution company operates 10000 distribution transformers. Over a period of 15 years [5]
200 of these transformers fail for various reasons. A small fraction of them can be repaired, but most failures require replacement with a spare transformer. 200 failures give a total of 9250 hours. Find out
 - (i) Failure Rate
 - (ii) Repair Rate
 - (iii) Expected Time to Failure
- b. What is voltage Sag and what is the cause of it? [5]
3. a. Explain the sources of Sags and the impacts of sags in appliances? [5]
b. Write short notes on. [5]
 - (i) Flicker
 - (ii) Total Harmonic distortion
4. a. Explain the role of active power filters in power quality improvement. [5]
b. What are the various causes of harmonics in distribution power system. [5]
5. a. Explain the concept of harmonic phenomena under the presence of harmonic producing loads? [5]
b. Explain the operation of adjustable speed DC drive? [5]
6. a. Explain the following causes of sags due to motor starting [5]
b. Explain in detail about various methods to mitigate voltage swells [5]
7. a. Explain the role of smart power Quality monitors in power quality monitoring system? [5]
b. Explain briefly the various devices for voltage regulations? [5]
8. Write short notes on
 - a) Interruption and its causes [5]
 - b) Equipment immunity [5]