

Student Exam No:- _____

GANPAT UNIVERSITY
M.TECH SEM-II ELECTRICAL ENGINEERING
REGULAR EXAMINATION APRIL-JUNE-2016
3EE206:- POWER QUALITY & ENERGY MANAGEMENT

Time: 3 Hours

Total Marks:-60

Instructions: (1) This Question paper has two sections. Attempt each section in separate answer book.

(2) Figures on right indicate marks.

(3) Be precise and to the point in answering the descriptive questions.

(4) Make suitable assumptions wherever necessary

SECTION-I

- Que-1 [A] Discuss importance of financial analysis. Explain net present value method with advantage and disadvantage. [04]
[B] Explain demand side management and state its feature. [03]
[C] Discuss plant energy performance and production factor. [03]
- OR**
- Que-1 [A] Define energy audit. Why energy audit is required? explain preliminary energy audit. [05]
[B] What do you mean by power quality? Discuss methodology of power quality problem evaluation. [05]
- Que-2 [A] What are the benefits of benchmarking energy consumption? Also discuss project priority guidelines. [05]
[B] Draw structure of deregulated industry and explain function of different entities. [05]
- OR**
- Que-2 [A] Discuss energy conservation tips for electrical utilities. [05]
[B] List various power quality measuring devices and discuss the main features of power quality analyzer? [05]
- Que-3 [A] In an energy storage project initial investment is Rs. 8,75,000. Its salvage value is Rs. 1,25,000. Its economic working life is 8 years & annual income of the project is Rs. 2,45,000. Its operating cost is Rs. 95,700/year. Assume straight line depreciation & interest of 12% per annual. Determine Annual ROI & Payback period. [05]
[B] Explain various methods to determine motor loading. Calculate discount factor if $n=5$ and $IR=8\%$. [05]

SECTION-II

- Que-4 [A] Explain the cause and effect with respect to power quality point of view? What is an immunity of the equipment? Discuss the treatment criteria for a machine. [05]
- [B] Define and technically describe following terms: [05]
(1) Linear loads (2) Voltage sag (3) Bonding (4) Grounding (5) Flicker (6) Notch

OR

- Que-4 [A] Explain the concept of individual and total harmonic distortion. [02]
- [B] What do you mean by harmonics? How harmonics are generated in power system network? Support your answer with suitable example. [05]
- [C] Discuss the guideline for voltage and current harmonic limitation. [03]

- Que-5 [A] What is a transient? Discuss the causes of transients in power system. [05]
- [B] Discuss "switching of loads" and "interruption of fault currents" as causes of transients. [05]

OR

- Que-5 [A] Discuss the factor affecting to find the system frequency response characteristics. [05]
- [B] Discuss the common power frequency disturbances with suitable examples. [05]

Que-6 Attempt the following questions.

- [A] What do you mean by active filter? Explain the working of an active filter with main block diagrams. [05]
- [B] A 2000 KVAR, 13.8 kV, star connected capacitor bank is connected at the end of a 25 miles transmission line with an inductive reactance of 0.5Ω per mile. Find the natural frequency of current that would be drawn during turn on. Assume fundamental frequency is 50Hz. [03]
- [C] Prove that third harmonic is in phase and have zero displacement angles between them. [02]

END OF PAPER

Best of Luck