ENERGY MANAGEMENT AND AUDITING

Basic Principles of Energy Audit
Energy audit- definitions, concept, types of audit, energy index, cost index, pie charts, Sankey diagrams, load profiles, Energy conservation schemes- Energy audit of industries- energy saving potential, energy audit of process industry, thermal power station, building energy audit.

Energy Management
Principles of energy management, organizing energy management program, initiating, planning, controlling, promoting, monitoring, reporting- Energy manger, Qualities and functions, language.

Energy Efficient Motors
Energy efficient motors, factors affecting efficiency, loss distribution, constructional details, characteristics - variable speed, variable duty cycle systems, RMS hp- voltage variation-voltage unbalance- over motoring- motor energy audit.

Power Factor Improvement, Lighting and Energy Instruments
Power factor – methods of improvement, location of capacitors, Pf with non-linear loads, effect of harmonics on power factor, power factor motor controllers - good lighting system design and practice, lighting control, lighting energy audit - Energy Instruments- wattmeter, data loggers, thermocouples, pyrometers, lux meters, tongue testers, application of PLC's.

Economic Aspects and Analysis
Economics Analysis-Depreciation Methods, time value of money, rate of return, present worth method, replacement analysis, life cycle costing analysis- Energy efficient motors- calculation of simple payback method, net present worth method- Power factor correction, lighting - Applications of life cycle costing analysis, return on investment.

Text Books

1. Energy Management by W.R. Murphy & G. Mckay Butter worth, Elsevier publications. 2012
2. Energy Efficient Electric Motors by John. C. Andres, Marcel Dekker Inc. Ltd – 2nd Edition, 1995
3. Electric Energy Utilization and Conservation by S C Tripathy, Tata McGraw hill Publishing Company Ltd, New Delhi.

Reference Books

1. Energy management by Paulo' Callaghan, Mc – Graw Hill Book company – 1st edition, 1998.
2. Energy management hand book by W.C. Turner, John wiley and son, 2001.
3. Energy management and good lighting practice: fuel efficiency booklet12 – EEO

MODEL QUESTION PAPER

ENERGY MANAGEMENT AND AUDITING

Answer any five questions.

Each question carries 20 marks Max. Marks:100

1. (a) Explain about energy audit in thermal power station.

   (b) What are the different types of audit? Explain them briefly

2. (a) What are the principles of energy management? Explain them

   (b) What is the role energy manager in energy management? Explain in detail

3. (a) Write about the stages in energy management.

   (b) Explain the characteristics of energy efficient motors.

4. (a) What are the advantages of energy efficient motors?

   (b) Write about the factors which affect the efficiency of energy efficient motors.

5. (a) Explain in detail about the power factor improvement methods.

   (b) Write the applications of PLC

6. Explain the effect of harmonics on power factor.

7. Explain the depreciation methods in detail.

8. Explain in detail about the calculation of simple pay back method.