



P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Eighth Semester, B.E. - Electrical and Electronics Engineering

Semester End Examination; June - 2017

Energy Auditing and Demand Side Management

Time: 3 hrs

Max. Marks: 100

Note: Answer FIVE full questions, selecting ONE full question from each unit.

UNIT - I

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|------|---------------------------------------------------------------------------------------------------------------------|----|
| 1 a. | Describe the present energy scenario in India. | 12 |
| | b. What are the issues that are addressed by the energy conservation act 2001? | 8 |
| 2 a. | Define Depreciation. Explain briefly the sum of year digits depreciation and declining balance appreciation method. | 8 |
| | b. What is pay back analysis? Mention its advantages. | 4 |
| | c. Calculate the depreciation rate using; | |
| | i) Straight line ii) Sum of years digit and declining balance methods | |
| | For the data given below : | |
| | Salvage value L is Rs = 0 | 8 |
| | Life of the equipment $n = 5$ years | |
| | Initial Expenditure P = Rs. 1,50,000. | |
| | For a declining balance method use a 200% rate. | |

UNIT - II

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|------|-----------------------------------------------------------------------------------------------------|----|
| 3 a. | Define energy audit as per energy conservation act 2001. Briefly explain the need for energy audit. | 6 |
| | b. Briefly explain what type of audit required to consider the energy use profile. | 8 |
| | c. Describe the classification of energy audit. | 6 |
| 4 a. | Give the ten methodology steps in energy audit and explain. | 10 |
| | b. What are the various measurements and instruments used in energy audit? | 10 |

UNIT - III

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| 5 a. | What are energy efficient motors? Mention the features and advantages of energy efficient motors. | 10 |
| | b. An educational institute takes a load of 400 kW at 0.80 p.f. lagging for 2300 hours per annum the tariff is Rs. 150/kVA plus 50 paise/kWh consumed. If the p.f. is improved to 0.95 lagging by means of capacitors costing Rs. 520/kVAR and having a power loss of 50 watts power/kVA. Calculate the annual saving effected by their use. Allow 10% per annum for interest and depreciation. | 10 |

- 6.a Write a neat sketch illustrate the typical location of capacitor in an industry to reduce power consumption. 8
- b. A factory which has a maximum demand of 175 kW at a power factor of 0.75 lagging is charged at Rs. 100 per kVA per annum. If the phase advancing equipment costs Rs. 100 per kVAR. Find the most economical power factor at which the factory should operate. Interest and depreciation total 10% of the capital investment on the phase advancing equipment. 6
- c. List out the disadvantages of low power factor. 6

UNIT - IV

- 7 a. What is DSM? How the concept of DSM evolved? 6
- b. Write a note on tariff option for DSM. 6
- c. Describe the benefit of DSM. 8
- 8 a. Discuss the steps involved in DSM planning and implementation with a block diagram. 10
- b. Write a brief note on peak clipping and valley filling. 10

UNIT - V

- 9 a. Write a brief note on the load priority techniques. 8
- b. List energy conservation opportunities in industrial sector. 6
- c. With a flow chart, explain plant level organization. 6
- 10a. Discuss in detail the factors influencing the customer acceptance of DSM. 10
- b. With a flow level diagram, explain division level organization and corporate level organization of energy conservation programme. 10

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