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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; July - 2021

Energy Auditing and Demand Side Management

Time: 3 hrs

Max. Marks: 100

Note: Answer any FIVE full questions.

- 1 a. Explain the energy conservation techniques used to reduce the energy costs. 10
- b. What is ABT? What are the broad features of ABT design? 10
- 2 a. Explain payback analysis. Mention its advantages and disadvantages. 8
- b. What is time value of money concept? Explain a cash flow model for single payment present worth method. 8
- c. A manufacturing concern purchases a lathe for Rs. 9000. The freight and haulage cost is Rs. 200 and charges for installation it is Rs. 250. Its life is 20 years and the scrap value is Rs. 300. Calculate the annual depreciation charges by straight line method. 4
- 3 a. Explain ten steps methodology for detailed energy auditing. 10
- b. What are energy management strategies? Explain them in brief. 10
- 4 a. Define energy audit. Explain the different types of energy audit and the need for energy auditing. 10
- b. Explain energy audit instruments. 10
- 5 a. Mention the causes of low power factors and explain the disadvantages of low power factor. 8
- b. Derive an expression for most economical power factor considering constant active power. Draw the relevant diagram. 8
- c. An alternator is supplying a load of 300 kW at 0.6 pF lagging. If the power factor is raised to unity. How many more kilowatts can alternator supply for the same kVA loading? 4
- 6 a. Explain in detail static capacitors and synchronous condensers used to active power factor improvement. 10
- b. Write an explanatory note on energy efficient motors. 6
- c. A single phase motor connected to 400 V, 50 Hz supply takes 31.7 A at a power factor of 0.7 lagging. Calculate the capacitance required parallel with the motor to raise the power factor to 0.9 lagging. 4
- 7 a. What is the scope of DSM? Explain the benefits of DSM. 10
- b. With a flowchart, explain various steps involved in DSM planning and implementation. 10
- 8 a. Explain the different techniques of DSM. 12
- b. Discuss tariff options for DSM. Which tariff promotes DSM? 8

- 9 a. Explain;
 - i) Peak clipping
 - ii) Valley filling
 - iii) Peak shifting
 - iv) strategic conservation with respect to DSM
- b. Explain energy conservation opportunities in;
 - i) Agricultural sector
 - ii) Illumination sector
- 10 a. Explain any two organization of energy conservation program.
- b. Explain in detail DSM implementation issues.

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