P3614

[5560]-569

T.E. (Electrical Engineering)
ENERGY AUDIT AND MANAGEMENT
(2015 Course) (Semester - II) (303150)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

1) *Neat diagrams must be drawn wherever necessary.*
2) *Figures to the right indicate full marks.*
3) *Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*
4) *Assume suitable data, if necessary.*

Q1) Give salient features of Electricity Act 2003. **[6]**

OR

Q2) What are the short term and long term energy policies? **[6]**

Q3) What is the necessity of energy policy ? Discuss the format of energy policy. **[7]**

OR

Q4) Explain duties and responsibilities of Energy Manager. **[7]**

Q5) Discuss implementation of demand side management for agricultural consumers. What will benefits of it for agricultural consumers? **[7]**

OR

Q6) Explain with suitable examples the role of tariff in energy management. **[7]**

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Q7) a) What is data analysis? What are different ways to analyse data? What are the benefits of data analysis? **[9]**

b) In a steel rolling mill monthly production related energy consumption was 2.1 times the production and non-production related energy consumption was 18,500 kWh per month. In the month of June a series of energy conservation measures were implemented. Use CUMSUM technique to develop a table and calculate energy savings for the subsequent 6 months period from the data given below.

Also plot CuSuM graph. **[9]**

Month	Production (kg)	Actual Energy Consumption (kWh)
Sept	65,000	1,43,000
Oct	71,000	1,50,000
Nov	78,000	1,58,000
Dec	80,000	1,60,000
Jan	62,000	1,30,000
Feb	73,000	1,52,000

OR

Q8) a) What is energy or power flow diagram. Explain with any two examples. **[9]**

b) Discuss least square method for data analysis. Also explain standard format for energy audit report. **[9]**

Q9) a) Explain criteria of selection of motors for different applications keeping in mind efficient operation. Also explain ways to increase efficiency during starting of motors. **[8]**

b) Energy saving opportunities in boiler and auxiliaries. **[8]**

OR

*Q10)*a) How fans, blowers and compressors are classified? Enlist energy conservation measures in fans. **[8]**

b) Explain the method for adequacy assessment for illumination system. What inferences can be drawn after assessment? **[8]**

*Q11)*a) The energy manager of company wants to replace 50 HP induction motor with energy efficient motor for energy saving. On the basis on following data calculate payback period for replacement of old motor with energy efficient motor. Take cost of electricity is Rs 7/kWh. The demand charges Rs. 450/kVA per month. **[8]**

Description	Old Motor	Energy Efficiency Motors
Rating of machine	50 HP	50 HP
Loading percentage	80%	80%
Operating hours per annum	6500	6500
Efficiency near full load	89%	93%
Power factor near full load	0.85 lag	0.89 lag
Capital cost	-	Rs. 2,50,000/-
Scrap value	Rs. 50,000/-	-

b) Explain financial appraisal criteria. **[8]**

OR

*Q12)*a) Calculate net present value for an investment of Rs. 5,00,000 for retrofit. The energy savings realised for five years are Rs. 1,00,000, Rs. 75,000, Rs. 1,25,000, Rs. 2,00,000 and Rs. 2,50,000/- With discounting factor is 13% judge the economic feasibility of the project. **[8]**

b) Explain with suitable example break even analysis. How it is different from others? **[8]**

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