

QUESTION BANK (K Scheme)

Course: Energy Conservation and Audit
Course Code: (316327)
Semester: 6K

Course Abbreviation: ECA
Unit Test: II
Program Code: EE

UNIT 4: Energy Conservation via Cogeneration and Tariff (16 marks) (CO4)

2 Marks

- 1) State the advantages of adoption of cogeneration system in an industry.
- 2) State the objectives of tariff systems. List the different types of tariff. Define peak off day tariff.
- 3) Define : (i) Co-generation (ii) Tariff
- 4) State the components of availability-based tariff. Identify the benefits and applications of availability-based tariff .
- 5) State the concept of flexible tariff.

4 Marks

- 6) Summarize the factors considered while selecting the co-generation system for a facility.
- 7) Explain with diagram: (i) Steam turbine co-generation system (ii) Gas turbine co-generation system.
- 8) Make use of load factor and maximum demand tariff to minimize electrical consumption of electrical installation.
- 9) An industrial consumer charged with the scheduled tariff of Rs.250 /kVA per month for maximum demand and 150paise per unit consumed for load factor of 60% and 80%. Find overall cost per unit at i) unity P.F. ii) 0.9 P.F. Consider maximum demand of 50 kVA.
- 10) Illustrate the benefits of time off day and peak off day tariff relevant to energy cost along with its impact on energy bill.
- 11) Differentiate between topping cycle and bottoming cycle.
- 12) A consumer has maximum demand of 700 KW at 70% Load factor. If tariff is ` 100/KW of maximum demand plus 20 paise per KWh. Find : (1) Unit consumed per year (2) Annual charges (3) Overall cost/KWh
- 13) Explain the 'incentive' and 'penalty' related to power factor tariff.
- 14) A factory has a max. load of 300 kW at 0.85 P.F. lagging with an annual consumption of 40,000 units. Applied tariff is ` 4.5 per kVA of MD plus 2 paise per unit plus 0.5 paise per unit of each 1% of P.F. below 0.9. Calculate the annual saving if P.F. is raised to 0.9.

UNIT 5: Energy Audit (16 marks) (CO5)

2 Marks

- 15) What is payback period? Calculate the payback period if investment is ` 2,00,000 & saving is `

50,000 per month.

- 16) Define 'energy audit instruments'. List any four instruments used in energy audit with their application. State minimum one application of the following energy audit equipments : (i) Lux meter (ii) Energy meter (iii) Voltmeter (iv) Power analyser
- 17) Define 'specific energy consumption' of an electrical apparatus.
- 18) List any six needs of energy audit.
- 19) State the roles and responsibilities of energy manager and auditor.

4 Marks

- 20) Illustrate significance of Sankey diagram to identify the area for energy conservation in thermal system. List out the informations that can be obtained from 'Energy Flow Diagram'. OR Draw power flow diagram of induction motor and describe methods of improving efficiency by good power quality. OR What is 'energy flow diagram'? State its significance.
- 21) Define and explain the procedure to calculate the payback period. Also, state its significance.
- 22) State difference between "walk through audit" and "detailed audit".
- 23) Describe with flow chart, the detailed energy audit procedure. OR Describe the different steps involved in detailed energy audit procedure.
- 24) Develop a questionnaire for the energy audit project of a small scale industry.
- 25) How penalty charges are calculated for exceeding contract demand in energy bill?
- 26) Exterior lighting of a housing complex is provided with 20 number of Tube light (40 W + 17 W ballast) and 10 no. of CFL (20 W) Lamps. It is recommended to replace them by T5 tubelight (32 W + 8w ballast). Calculate the simple payback period. Data given : Working hours per day = 10 Working days per month = 25 Cost of T5-Tubelight = ` 150 per piece Energy cost = ` 4 per unit.