

**B.Tech. - VIEP - ELECTRICAL ENGINEERING
(BTELVI)**

Term-End Examination

00173

December, 2018

BIEE-026 : ENERGY AUDITING AND ANALYSIS

Time : 3 hours

Maximum Marks : 70

Note : *Attempt any seven questions. Each question carries equal marks. Use of scientific calculator is allowed.*

1. (a) Explain the effects of energy auditing on economic operation of an electrical system. 6
- (b) Discuss the importance of load profiling for energy auditing. 4
2. During April 2018, a plant has recorded a maximum demand of 600 kVA and average p.f. of 0.82 (lagging). The minimum average p.f. to be maintained is 0.92 (lagging) and every 1% dip in p.f. attracts a penalty of ₹ 10,000 in each month.
 - (a) Calculate the improvement in p.f. for May, 2018 by installing 100 kVAr capacitors.
 - (b) Calculate penalty to be paid, if any, during May, 2018. 10

3. What is energy efficiency ? How does transformer loading affect the energy efficiency of the transformer ? 10
4. List all the possible energy conservation measures possible in lighting systems. 10
5. (a) Explain the factors to be considered while selecting a motor. 5
- (b) What steps should an energy manager take to 5
- (i) minimize voltage imbalance ?
- (ii) match load with motor characteristics ?
6. What are the different control schemes for industrial drives ? Explain the energy conservation schemes for each control strategy. 10
7. A reciprocating refrigeration compressor of 100 TR is working at full load with 4.5°C temperature difference across the evaporator.
- (a) Estimate the water flow rate if water is secondary coolant.
- (b) Assess the connected motor size (kW) to this refrigeration compressor. 10
- Assume specific heat of water as 1.0 kcal/kg °C.

8. Discuss the energy conservation measures for electric furnace. Prepare a schedule for different energy conservation steps. 10
9. Write short notes on any *two* of the following : 2×5=10
- (a) Specific energy consumption and energy economics
 - (b) Efficient control strategies for fans
 - (c) Cogeneration and Trigeneration schemes
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