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M.Tech. (EE) (2018 Batch) (Sem.–2)
INDUSTRIAL LOAD MODELING AND CONTROL
Subject Code : MTEE-204D-18
M.Code : 76109

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. Attempt any FIVE questions out of EIGHT questions.
2. Each question carries TWELVE marks.

1. Describe the following :

    a. Indian energy scenario and tabulate energy data which includes; generation capacity, share of public and private sectors, share of different power plants etc.

    b. What do you mean by load modeling? How will you represent the voltage dependent loads?

    c. An industrial load is supplied with the captive power plant having maximum capacity of 150MW and the following values at different times of the day are observed.

Time	12 am	5 am	9 am	6 pm	8 pm	10 pm	12 am
Load (MW)	50	50	100	100	150	80	50

    With the help of graph paper, plot a chronological load curve. Find the energy requirement of an industry in one day and its daily load factor.

2. What is the significance of load management? Describe, in detail, supply side and demand side load management. How industrial load management is different from commercial or residential load management in general?

3. Describe the following :

    a. Criterion of electricity pricing and pricing models.

    b. Differentiate direct load control and interruptible load control.

    c. Write down the steps involved in optimization and control algorithm.

4. How will you calculate the most economic power factor when kW demand in an industry is constant? An industrial installation has a load of 1MW at power factor 0.78 lagging. The tariff is Rs. 200 per kVA of maximum demand per year plus Rs. 3.50 per kWh. The power factor is improved with the installation of capacitor bank. The cost of installation of capacitor is Rs. 500 per kVAr. The interest and depreciation is 15%. Plant load factor is 0.8. Find :

   a. most economical power factor

   b. capacitor kVAr to improve the power factor to this value

   c. annual electricity bill before and after installation of capacitor.

5. How captive power plant is different from cogeneration? Describe the operating and control strategies of captive power generation in detail.

6. What is the criterion for the selection of schemes for optimal operating strategies for reduction of peak load in the industrial processes? Describe in detail.

7. What are the power quality issues in industrial process and how will you deal with the associated problems for smooth operation and control?

8. Write a short note on :

   a. Energy banking and filter energy saving in industry

   b. Modeling of cooling and heating loads

   c. Integrated load management for industries

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.