Exam.Code:0937
Sub. Code: 6639

2123

B.E. (Electrical and Electronics Engineering)
Seventh Semester
EE-709: Electrical Power Generation

Time allowed: 3 Hours Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.

x-x-x

1. Attempt the following:-
   a) Why pulverized fuel is preferred? What are the types of pulverized fuel burners?
   b) What is the effect of load factor on the cost of generation in a power system?
   c) Why do some power companies put a penalty for low power factor?
   d) Distinguish between operating reserve and spinning reserve.
   e) Why is it economical to operate hydro steam plants in combination? (5x2)

UNIT - I

2. a) A generating station has a connected load of 450 MW and a maximum demand of 250 MW; the unit generation being 615 X 10^6 per annum. Calculate (i) demand factor and (ii) load factor.

   b) A generating station has a maximum demand of 100 MW. Calculate the cost per unit generation from the following data:

   Capital cost = Rs 200 X 10^6
   Annual load factor = 40%
   Annual cost of fuel and oil = Rs. 15 X 10^6
   Taxes, wages and salaries etc. = Rs 10 X 10^6
   Interest and depreciation = 15% (2x5)

3. A 400 V, 3 Phase star connected induction motor draws a current of 25A at 0.8 lagging power factor under full load condition. It is desired to install a bank of capacitors to raise the full load overall power factor to 0.9 lagging. Find the kvar rating of the star connected capacitor bank and the value of each capacitor. (10)

4. a) What do you understand by the term 'load diversity'? What is its significance?
   b) A power plant has an initial cost of Rs.2x10^8. Assuming a salvage value of 15% and useful life of 25 years. Find the rate of depreciation by fixed percentage method. (2x5)

P.T.O.

UNIT - II

5. Explain the choice of size and number of generator units in a power plant. (10)

6. An Industry load can be supplied on the following alternative tariffs:

(a) H.V supply at 60 per kVA per annum plus 3 p per kWh

(b) L.V supply at Rs. 65 per kVA per annum plus 3.3 p per kWh

Transformers and switchgear suitable for the H.V supply costs Rs 50 per kVA, the full load transformation losses being 2%. The fixed charges are 20% per annum on the capital cost of the H.V plant and the installation works at full load. If these are 50 working weeks in a year find the number of working hours per week above which the H.V supply is cheaper. (10)

7. A two-plant system having a steam plant near load centre and a hydro plant at a remote location is shown in Fig.(1). The load is 700MW for 14 hours a day and 500MW for 10 hours a day. The characteristics of units are:

$C_1 = (24+0.02P_1)P_1$ Rs/hours

$W_1 = (6+0.0025P_1)P_2$ m^3/Sec

Loss coefficient $B_{22} = 0.0005$

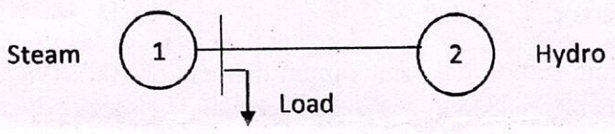

Fig. 1

Find the generation schedule, daily water used by hydro plant and daily operating cost of thermal plant for r_2 =2.5 Rs per hour/m^3 per sec. (10)

x-x-x