Roll No. ☐☐☐☐☐☐☐☐☐☐☐   Total No. of Pages : 02

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B.Tech.(EE)(2012 Onwards)/(EE)PT   (Sem.–5)

ELECTRIC GENERATION & ECONOMICS

Subject Code : BTEE-502

M.Code : 70555

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Answer briefly :

   a) What are base load and peak load plants?

   b) Define peak diversity factor.

   c) What do you mean by load forecasting?

   d) Define load factor.

   e) Name the different types of tariff.

   f) Distinguish between operating reserve and spinning reserve.

   g) Define capacity factor.

   h) What do you mean by hydrothermal scheduling?

   i) State the pollution problems caused by various types of power plants.

   j) What do you mean by Cogeneration?

SECTION-B

2. The maximum demand of a power plant is 40 MW. The capacity factor is 0.5 and the utilization factor is 0.8. Find (a) Load factor (b) Plant capacity (c) Reserve capacity (d) Annual energy production.

3. The incremental costs in Rs. Per MW-hour of two 250 MW units are as under :

$$\frac{dC_1}{dP_1} = 0.2P_1 + 30$$

$$\frac{dC_2}{dP_2} = 0.15P_2 + 40$$

The minimum load of each is 20MW. Find the load division between the two units as the total load varies from 40MW to 500 MW.

4. An industrial consumer has a single phase 230 V supply. His monthly energy consumption is 2020 kWh. A maximum demand indicator installed at his premises indicates 40A which is charged at unity power factor for 2 hours daily at Rs. 9.50 per kWh. The remaining units are charged at Rs. 7.50 per kWh. Find the monthly bill (for 30 days) and average tariff per kWh.

5. Discuss the advantages of combined working of Run-off river plant and steam plant.

6. What are the benefits of Co-generation? Discuss the various cogeneration technologies.

SECTION-C

7. A region has a maximum demand of 500 MW at a load factor of 50%. The load duration curve can be assumed to be a triangle. The utility has to meet this load by setting up a generating system which is partly hydro and partly thermal. The costs are as under :

Hydro plant : Rs. 7300 per kW per annum + operating expenses Rs. 0.42 per kWh.

Thermal plant Rs. 3800 per kW per annum + operating expenses Rs. 1.66 per kWh.

Determine the capacity of hydro plant, capacity of thermal plant, energy generated annually by each and overall generation cost per kWh.

8. a) What do you mean by load forecasting? Discuss the various methods of load forecasting.

   b) Discuss the Factors which tend to limit the size of units of steam plants.

9. Explain briefly :

   a) Methods of loading turbo generators

   b) Organization of power sector in India

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.