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B.Tech. (EE) (Sem.–6)
POWER GENERATION AND ECONOMICS
Subject Code : BTEE-602-18
M.Code : 79313
Date of Examination : 05-07-22

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS 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. **Write briefly :**

   a) Explain the chronological load curve with suitable diagram.

   b) What is diversity factor?

   c) Discuss the different type load.

   d) Write the different causes of low power factor.

   e) The maximum demand on a power system is 100 MW. If the annual load factor is 40%, calculate total energy generated in a one year.

   f) Define spinning reserve.

   g) Why are nuclear power reactors used as backup generators?

   h) What information can be supplied by load curves?

   i) Explain the thermo-electric conversion system.

   j) What does economic load scheduling mean?

SECTION-B

2. The annual load duration curve of a small hydro plant shows 438×10^4 kWh of energy during the year. It is a peak load plant with 20% annual load factor. Find station capacity, if plant capacity factor is 15%, find reserve capacity of the plant.

3. Explain the advantage of combined operation of hydro power plants and thermal power plants.

4. Define load forecasting. Also discuss the different methods which are generally used for forecasts or estimate of future demand of electrical energy.

5. Explain the economics operation of power system with considering transmission losses.

6. Differentiate between the base load plants and peak load plants.

SECTION-C

7. What is cogeneration? Differentiate between topping and bottoming cycles. Also, discuss the benefits of cogeneration system.

8. Find the generation cost per unit of energy from following plant data:

Installed capacity = 120 MW

Capital cost of plant = Rs. 40000 per kW

Interest and depreciation = 15%

Fuel consumption= 0.64 kg/kWh

Fuel cost = Rs. 1500 per 1000kg

Salaries, wages, repair and other operating cost per annum = Rs. 50,000,000

Peak load = 100 MW

Load factor = 60%

9. A generation station of 1 MW supplied region which has following demands:

From	To	Demand (kW)
Midnight	5 A.M.	100
5 A.M.	6 P.M.	No-load
6 P.M.	7 P.M.	800
7 P.M.	9 P.M.	900
9 P.M.	Midnight	400

Neglect transmission line losses and find the following :

a) Plot the daily load curve and the load duration curve

b) Find the load factor, plant capacity factor, and plant utilization factor.

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.