Please check that this question paper contains 09 questions and 01 printed pages within first ten minutes.

[Total No. of Questions: 09] [Total No. of Pages: 01]

Uni. Roll No. ……..

Program: B. Tech.
Semester: 5th
Name of Subject: ELECTRIC GENERATION AND ECONOMICS
Subject Code: PCEE-113
Paper ID: 16465

Time Allowed: 02 Hours **Max. Marks: 60**

NOTE:
1) Each question is of 10 marks.
2) Attempt any six questions out of nine.
3) Any missing data may be assumed appropriately.

18-01-2022(E)

Q1. **a.** What do you understand by the term power factor? What are the causes and effects of low power factor? **(5)**

b. Explain the methods of loading turbo-generators. **(5)**

Q2. The load curve of an electrical system is linear with the following values at different times:

Time	12	2am	5am	8am	5pm	6pm	9pm	12
Load MW	20	10	10	50	50	100	100	20

(10)

a. Plot chronological load curve and load duration curve for the system.
b. Plot energy curve and mass curve.
c. Find load factor of the system.

Q3. Why is it necessary to consider transmission loss in optimum scheduling? Explain the equal incremental costs criteria for optimum scheduling in power plants. **(10)**

Q4. Two units of thermal station have each the following cost characteristics

$$C = 2000+20P+0.05P^2 \text{ Rs/hr}$$

Due to an instrumentation error the cost characteristics of first unit is in error by +3% and that of the second unit by -3% at the time of scheduling. Find the extra operating cost due to erroneous scheduling. Total load is 150MW. **(10)**

Q5. Discuss the factors which tend to limit the size of units in thermal generating plants. Also differentiate between fixed and operating costs. **(10)**

Q6. Describe the social and economic impacts of power plants, also discuss environment aspect. **(10)**

Q7. Discuss the methods used for computing the generation schedules in a combined hydro-thermal system. **(10)**

Q8. Explain various cogeneration technologies, also discuss benefits of cogeneration. **(10)**

Q9. Determine the generation cost per unit of energy from the following plant data: Installed capacity=120MW, 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=100MW, Load factor=60%. **(10)**

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