B. Tech. VII Sem. (Main / Back) Exam., Nov. – Dec. - 2018
Electrical Engineering
7EE6.3A Economic Operation of Power Systems

Time: 3 Hours

ersahilkagyan.com

Maximum Marks: 80
Min. Passing Marks: 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL ___

2. NIL ___

UNIT- I

Q.1 (a) Explain the fixed percentage method to calculate the depreciation charge. [8]

(b) Discuss about the economics in plant selection and explain the economics of different types of generating plants. [8]

OR

Q.1 (a) What are the different factors affecting economic generations and distributions of generating plants? [8]

(b) A power plant has an initial cost of ₹2×10^8. Assuming a salvage value of 15% and useful life of 25 years. [8]

(i) Find rate of depreciation by fixed percentage method.

(ii) Also find accumulated depreciation at the end of 10th year.

UNIT-II

Q.2 (a) Explain the following of thermal power plant.

   (i) Effects of transmission losses [4]

    (ii) Sequence of adding units [4]

(b) Explain the different methods of loading turbo generators in power plants. [8]

OR

Q.2 (a) What do you mean by penalty factors? Derive an expression of penalty factors? Explain its utility for power plant?

[8]

(b) A system consists of two plants connected by a transmission line as shown in figure below. The load is at plant 2. The transmission line loss calculations reveal that a transfer of 100 MW from plant 1 to plant 2 means a loss of 15 MW. Find the required generation at each plant for $\lambda = 60$. Assume that the incremental costs of the two plant are given by: [8]
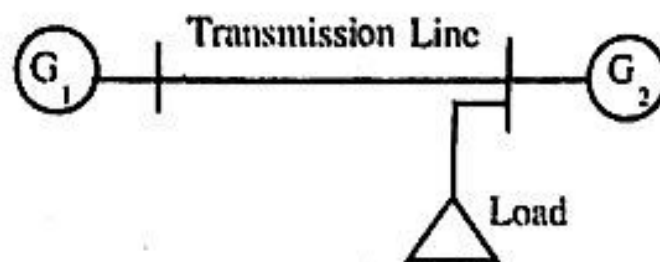
$$\frac{dc_1}{dP_1} = 0.2\, P_1 + 22\ ₹/MWh$$

$$\frac{dc_2}{dP_2} = 0.15\, P_2 + 30\ ₹/MWh$$

UNIT-III

Q.3 (a) What do you mean by short term hydro thermal coordination? Explain with

suitable example. [8]

(b) Discuss the advantages of combined operation (hydro-thermal coordination). [8]

OR

Q.3 (a) Explain combined working of run-off river and steam plant. [8]

(b) Explain the reservoirs of hydro and thermal plants. [8]

UNIT-IV

Q.4 (a) Explain load sharing and sharing of load currents when two alternators are

running in parallel. [8]

(b) Write short note on infinite bus bar. [4]

(c) Discuss the conditions necessary for parallel operation of alternator. [4]

OR

Q.4 (a) Explain synchronizing current and power for two alternators in parallel. [8]

(b) Discuss the operating limits of alternators. [8]

UNIT- V

Q.5 (a) Explain the concept of break even cost analysis in brief. [8]

(b) Describe supply and demand economics. Also explain the equilibrium of the economy. [8]

OR

Q.5 (a) Describe financial efficiencies of electrical goods and services in brief. [8]

(b) How does the change in demand occurs? Explain with required curves. [8]