Exam.Code:0938
Sub. Code: 33800

2055

B.E. (Electrical and Electronics Engineering)

Eighth Semester

OE-EE-803: 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

I. Attempt the following:-

a) How can the load duration curve help in planning the capacity of power plants?

b) Why is a two part tariff considered more rational than a flat-rate tariff?

c) How does the availability of water resources influence the scheduling of hydro plants in a mixed system?

d) Define depreciation in context of power plants. How does load factor affect cost of energy?

e) Why is power factor improvement necessary? What kind of tariff is suitable for agriculture loads? (5x2)

UNIT - I

II. a) Explain the organization of power sector in India. Describe roles of generation, transmission and distribution companies.

b) Draw and explain the single line diagram of a thermal power station. Mention main components and their functions. (2x5)

III. a) Maximum demand of a generating station is 100 MW. The load factor is 65%. The plant capacity factor and plant factor are 50% and 80% respectively. Determine the daily energy produced, installed capacity of plant, reverse capacity of plant, and maximum energy that could be produced daily at full load.

b) Discuss the significance and construction of mass curves in hydro power systems. (6,4)

IV. a) A 300 KVA distribution transformer costs Rs. 20,000 and has a salvage value of Rs. 1000 at the end of 20 years. Determine the depreciated value of the power plant at the end of ten years on the following methods:-

i) Straight line depreciation.

ii) Sinking fund depreciation of 8% compounded annually.

b) List the objectives and requirements of tariff. (7,3)

UNIT - II

V. a) Discuss the various costs associated with power plants - capital cost, annual fixed cost and operating cost. How do they influence cost of energy?

b) Discuss the economic comparison of alternative power plant projects using present worth, annual cost and capitalized cost methods. (2x5)

P.T.O.

VI. a) Explain various scheduling methods used in hydro-thermal coordination. Which method is most effective and why?

b) A hydro plant provides a firm capacity of 40 MW, and a thermal plant provides 60 MW. Peak demand is 130 MW. What capacity must be added to meet peak demand with 10% reserve? (2x5)

VII. a) Consider a power system with thermal plant cost is given as ₹ $(0.02P^2 + 10P)$ ₹/hr, hydro plant energy available is 500 MWh over 10 hours. Load demand is 100 MW constant. Determine hourly hydro generation if thermal cost is to be minimized.

b) Write note on :-

i) Rate of return method in economics

ii) Economic power factor (2x5)

x-x-x