

M.E. Electrical Engineering (Power Systems)
1st Semester

EE-8102: Power System Operation and Control

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt any five questions.

-*_**_*

I. What is the normal operating state of a power system? What do you mean by state estimation with respect to power system? Explain briefly the method of maximum likelihood weighted least squares estimation. (10)

II. Two area A and B are interconnected. Generating capacity of A is 36,000Mw with regulating characteristics of 1.5%/0.1Hz. B has 4000Mw with 1%/0.1Hz. Find each area's share of 400Mw (load increase) disturbance occurring in B and resulting tie-line flow. (10)

III. A generating station has following daily load cycle: -

Time:	0-6	6-10	10-12	12-16	16-20	20-24
Load:	20	25	30	25	35	20

Draw load curve and calculate: -

- (a) Maximum demand
 - (b) Average Load
 - (c) Load factor
 - (d) Units generated per day
- (10)

IV. Develop an algorithm for solving optimum dispatch equation of system taking into account the effects of system losses.

A power plant consist of two 200Mw units, where input cost data given by

$$C_1 = 0.004P_i^2 + 2.0P_i + 80$$

$$C_2 = 0.006P_i^2 + 1.5P_i + 100$$

For the total load of 250Mw, what should be the division of load between two units for economic operation? (10)

V. Write note on following (any two):-

- (a) AGC in restricted power system
 - (b) Bas point and participation factors
- (5+5)

P.T.O.

(2)

- VI. Draw the block diagram of speed governor mechanism model? Explain its operations with speed load characteristics. (10)
- VII. Explain the methods available for providing economic operation of power system. Write note on spinning reserve, hot reserve, cold reserve. Also explain the mathematical technique for hydro thermal scheduling problem. (10)
- VIII. Explain the power system operation and control and role of computer in the implementation with the help of block diagram. List the applications of SCADA and power system security. (10)
