

**IV B.Tech I Semester Supplementary Examinations, April/May 2005**  
**POWER SYSTEM OPERATION & CONTROL**  
**(Electrical & Electronic Engineering)**

Time: 3 hours

Max Marks: 70

Answer any FIVE Questions  
All Questions carry equal marks

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1. (a) What is an incremental fuel cost? How is it used in thermal plant operation?  
(b) Name the components of production cost and explain.
2. (a) Differentiate between fixed and operating cost of power plants  
(b) Derive the condition to be satisfied for economic operation of a loss less power station.  
(c) In a two plant system, the load is entirely concentrated at the plant 1. for a given condition, 100 MW, transferred from plant 2 to the load results in a loss of 10 Mw. Calculate the loss formula coefficients.
3. Explain Unit commitment problem and discuss the solution using dynamic programming.
4. Give the computational procedure for optimal power flow with out in equality constraints.
5. Obtain the dynamic response of load frequency control of isolated power system for first order approximation.
6. (a) What is area control error? What are the control strategies?  
(b) For two-area load frequency control with gain blocks, derive an expression for steady values of change in frequency and tie line power for simultaneously applied unit step load disturbance inputs in the two areas.
7. A 400 kV line is fed through an 132/400 kV transformer from a constant 132 kV supply. At the load end of the line the voltage is reduced by another transformer of normal ratio 400/132 kV. The total impedance of line and transformers at 400 kV is  $(50 + j100)$  ohm. Both transformers are equipped with tap-changing facilities which are so arranged that the product of the two off-nominal setting is unity. If the load on the system is 250 MW at 0.8 p.f. lagging, calculate the settings of the tap-changers required to maintain the voltage of the load busbar at 132 kV.
8. Explain clearly what do you mean by compensation of line and discuss briefly different methods of compensation.

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