Roll No .....

EX - 701

B.E. VII Semester

Examination, December 2012

Power System - II

Time : Three Hours

Maximum Marks : 100 ***Minimum Pass Marks :35***

Note: *Attempt all questions.*
Internal Choice is given.
All questions carry equal marks.

1. (a) Explain Gauss Seidal method of power flow analysis. Give necessary changes and steps clearly to account Q-limits of voltage controlled buses. (14)

   (b) Give a comparison of Gauss-Seidal, Newton-Raphson and FDLF methods of Power flow analysis. (6)

OR

(a) A constant load of 350 MW is supplied by two generators 1 and 2, for which the incremental fuel costs are $\frac{dF_1}{dP_1} = 0.15\,P_1 + 20$ Rs./Mwh; $\frac{dF_2}{dP_2} = 0.12\,P_2 + 18$ Rs/Mwh with power P in MW and cost F in Rs/hr. Determine i) the most economical division of load between the generators ii) the saving in Rs/day thereby obtained compared the equal load sharing between generators. (15)

(b) What is infinite bus-bar? (5)

II. Discuss the term 'dynamic incremental state variables' and 'coherency'. Briefly outline the the power control mechanism of an individual generator and develop the mathematical model of a speed governing system. Derive transfer function. (20)

OR

Explain the flat frequency control of power system. What devices will you use for this purpose? How do you distinguish flat tie line load control and load bias control? (20)

III. (a) With the help of suitable diagram, explain the working of an automatic voltage regulator. (14)

(b) Discuss the utility of excitation control. (6)

OR

(a) Discuss "Integral Control Strategy". (10)

b) Explain the effect of governor on the transient stability of an electric energy system. (10)

IV. (a) Distinguish between steady state and transient stability limits of a power system and derive an expression for the maximum power that can be transmitted without loss of steady state stability. (15)

(b) Write Swing equation for a single machine system. (5)

OR

(a) Explain "Equal area criterion" for determining the transient stability limit of a power system. (8)

(b) A certain 50 Hz alternator delivers 1 p.u. power to an infinite bus bar through a network in which resistance may be neglected. A fault occurs which reduces the maximum power transferable to 0.5 p.u. Before the fault this power was 2 p.u. and after the clearance of the fault 1.5 p.u. Determine the critical clearing angle. (12)

V. Write any two of the following.

(a) Discuss the problems associated with modern interconnected power system. (10)

(b) Explain deregulation of power system. (10)

(c) Discuss about the energy pricing in transmission system. (10)

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