*B.E. sean-VII (old) Electrical - PSOC   1/12/16*
Power system operation and Control

Q.P. Code : 626600

(3 Hours)   **[Total Marks : 100**

Note: Question No. 1 is compulsory.
Solve any **FOUR** questions out of remaining.
Assume suitable data if required and mention the same.

Q.1   Answer the following questions   20
   a) Prove that for transmission stability the accelerating power should be equal to decelerating power.
   b) Discuss the advantages of NR method for load flow solution.
   c) Write down the condition for Economic Load dispatch by neglecting transmission losses.
   d) What is Power Pool?

Q.2
   a) Explain the working of thermal governing system.   10
   b) Obtain the incremental tie line power equation for two area load frequency control system and draw its bock diagram representation.   10

Q.3
   a) Discuss the Newton-Raphson method for load flow study.   10
   b) In two bus system shown, bus 1 is a slack bus with $V_1 = 1.0\angle0°$ pu and bus 2 is load bus with $S_2 = 2.8 + j0.6$ pu. The line impedance is $Z = 0.02 + j0.04$ pu   10
      a) Using Gauss Seidel method, determine V_2. Perform one iteration.
      b) Determine S_1, reactive and real power loss in the line.
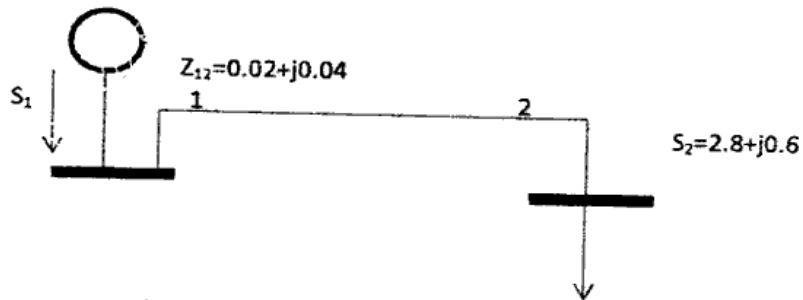
Q.4
   a) Explain Swing equation which describes the rotor dynamics for a synchronous machine.   10
   b) Discuss Equal Area criteria and explain the application of equal area criteria for sudden change in mechanical load.   10

TURN OVER

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Q.5

  a) Derive the expression for the transmission loss using B-coefficient.   **10**

  b) A system consists of two plants connected by a tie line and a load is located at plant 2.   **10**
When 100MW are transmitted from plant 1, a loss of 10MW takes place on the tie
line. Determine the generation schedule at both the plants and power received by the
load when λ for the system is Rs. 25 per MWhr and the incremental fuel costs (IC) are
given by the equation,
$IC_1 = 0.03P_1 + 17$ Rs/MWhr
$IC_2 = 0.03P_2 + 19$ Rs/MWhr

Q.6

  a) Discuss the classification of various states of power system.   **10**

  b) What are the various assumptions in Decoupled and Fast Decoupled load flow study?   **10**

Q.7   Write short note on any **two**   **20**
     i)Unit commitment and reliability considerations.
     ii)Power system stability.
     iii)Power system security.

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