B.E. Electrical Engg CBGS
VII Sem 23.11.15
PS0C

QP Code : 5857

(3 Hours) [Total Marks : 80

NOTE

1. Question number 1 is compulsory
2. Attempt any three from the remaining
3. Figures to right indicates full marks
4. Assume suitable data if necessary and mention the same

1. Attempt any four of the following :- 20

a) What are the types of buses & explain need of slack bus in load flow studies 05

b) For the three bus system determine the magnitude of shunt suscepatance of the line connecting bus 1 and 2 for following Y_{BUS} 05

$$j\begin{bmatrix} -13 & 10 & 5 \\ 10 & -18 & 10 \\ 5 & 10 & -13 \end{bmatrix}$$

c) Define power system stability and classify it on the basis of nature of disturbance 05

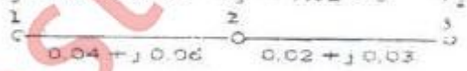
d) State assumptions made in transient stability studies 05

e) Write difference between GS and NR, methods of load flow studies 05

2. 20

a) Explain Y_{BUS} formation by singular transformation 10

b) For the network shown in figure obtain the complex bus bar voltage at bus 2 at the end of the second iteration. Use the Gauss seidal method. Line impedances are given in pu Given Bus 1 is slack bus with 10
$V_1 = 1 < 0$
$P_2 + j\,Q_2 = -5.6 + j\,1.46$ Assume $V_3^0 = 1.02 < 0$ $V_2^0 = 1 < 0$



3. 20

a) The fuel cost functions for three thermal plant in Rs/h are given by 10

$$C_1 = 500 + 5.3P_1 + 0.004P_1^2$$
$$C_2 = 400 + 5.5P_2 + 0.006P_2^2$$
$$C_3 = 200 + 5.8P_3 + 0.009P_3^2$$

Where P_1, P_2 and P_3 are in MW. The total load P_D is 800 MW. Neglecting transmission line losses and generator limits, find the optimal dispatch and the total cost in Rs/h

b) Derive formula for Bmn coefficients in transmission loss formula 10

4. 20

a) Find the steady state power limit of a system consisting of a generator equivalent reactance 0.5 p.u connected to an infinite bus through a series reactance of 1.0 p.u. The terminal voltage of the generator is held at 1.2 p.u and the voltage of the infinite bus is 1 p.u 10

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	b)	Derive swing equation of power system	10
5.			20
	a)	Draw and explain turbine speed governor system and explain	10
	b)	Explain dynamic response of change in frequency for step change in load of an isolated power system. How dynamic response changes with integral control action	10
6.		Write short notes on (any two)	20
	a)	power pool and its advantages and disadvantages	10
	b)	Surge impedance and surge impedance loading	10
	c)	AGC in restructured power system	10
