May 2018

E: (Electrical) Sem VII CBGS PSOC. May 2018 Q.P. Code :22963 11/05/18

Duration: 3 Hours **Total Marks: 80** 1/2

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) In turbine speed governor system $\Delta Pc=0, \Delta f$ is unit step, R=2.5, Ksg=1, Tsg=0.4, Determine ΔY_E after 0.4 s 05

b) For following Y_{BUS} fill in the blanks, all $y_{i0} = 0$ 05

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

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

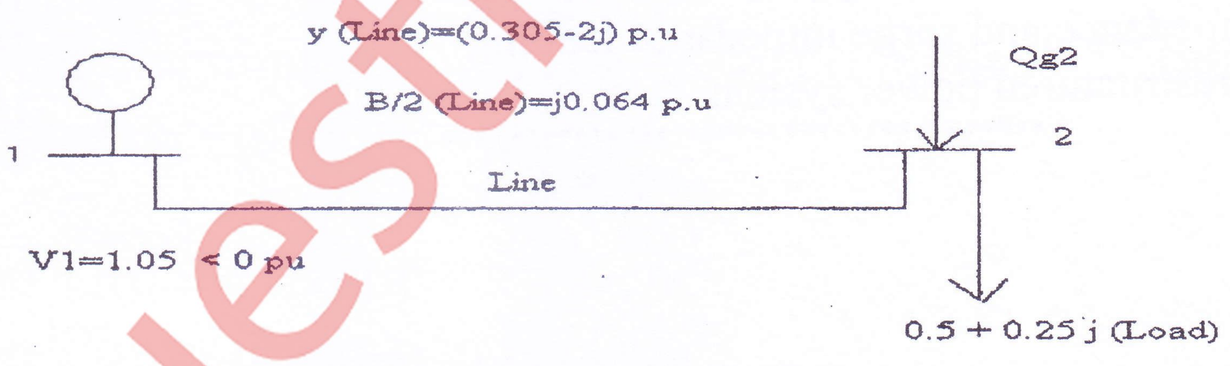
d) State whether statement is 'true' or 'false' and justify your answer "The equal area criterion gives only qualitative answer to system stability" 05

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) A simple two-bus power system is shown in fig 10



$|V_2|=1.0$ p.u (Bus 2 is PV bus). Obtain δ_2 and Q_{g2} at the end of first iteration of N-R method.

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

B.E (Electrical) Sem VII CBGS PSOC May 2018 11/05/18

 2/2

4.			
	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	20
	b)	A syncronous generator having H= 8 MJ/MVA is connected to an infinite bus and supplying power of 1 pu with initial power angle as 25 degree. Assume three phase fault occurring at t=0 and cleared at t=0.2 sec. The power equations expressed in pu are as under Power transfer in pre-fault condition=2.5 sin δ Power transfer in during-fault condition=0.6 sin δ Power transfer in post-fault condition=1.5 sin δ. The system frequency is 50 Hz, use step by step method to solve the swing equation with step size 0.05 till the fault is cleared	10
5.			
	a)	Draw turbine speed governor system and explain briefly 4 major parts in it	20
	b)	Expiain 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

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