CBCS Scheme

USN | | | | | | | | | | |

16/17EPS13

First Semester M.Tech. Degree Examination, Dec.2017/Jan.2018
Power System Dynamics (Stability and Control)

Time: 3 hrs. Max. Marks: 80

Note: ***Answer FIVE full questions, choosing one full question from each module.***

Module-1

1 a. Define stability. Explain with the help of a block diagram the states of operation of power system. **(08 Marks)**

b. Define part's transformation. Explain in briefly about transformation of stator voltage equation. **(08 Marks)**

OR

2 a. Fig. Q2(a) shown SMIB system

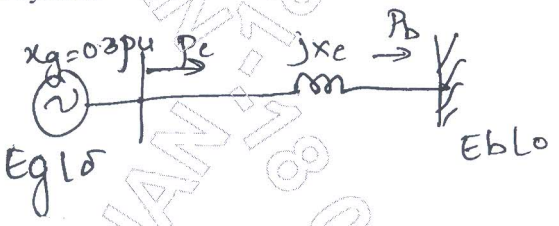

Fig. Q2(a)

Genertor reactance X_g = 0.3pu, External reactance X_c = 0.5pu; $E_g = E_b$ = 1.0pu $P_c = P_b$ = 1.0pu. Find the equilibrium values of δ in the range of $(-\pi, \pi)$. Test for stability. **(08 Marks)**

b. Explain steady state performance of an unloaded generator. **(08 Marks)**

Module-2

3 a. From transfer function of second order system, derive state equations. **(08 Marks)**

b. Determine parameters of Quadrature Axis equivalent circuit. **(08 Marks)**

OR

4 a. With neat block diagram, explain
i) Ac excitation system
ii) Static Excitation system. **(08 Marks)**

b. Explain about frequency response test. **(08 Marks)**

Module-3

5 a. Explain the dynamic load model of an induction motor nd obtain an expression for electric torque. **(08 Marks)**

b. For synchronous model 1.1 derive rotor equations of field circuit with one equivalent damper an q-axis **(08 Marks)**

OR

6 a. Explain about variable impedance type SVC and voltage source type SVC. **(08 Marks)**

b. A generator is connected to an infinite bus through external impedance of jxe. If $E_b = V_b = 1.0$pu. $P^t = 1.0$pu. Find initial conditions. Assume $X_e = 0.25$pu. The generator data $x_d = 1.8$, $x_q = 1.7$, $x'_d = 0.17$, $x'_q = 0.23$, $R_a = 0.0$, $T'_d = 0.4$Sec, $T'_q = 0.1$Sec, $H = 4$Sec, $f_B = 60$Hz. **(08 Marks)**

Module-4

7 a. Explain the representation of flux decay and Excitation system with neat block diagram. **(08 Marks)**

b. Explain about Jorisonal filter and limiter. **(08 Marks)**

OR

8 a. Explain the application of R-H criterion for stability of system neglecting. **(08 Marks)**

b. Explain about control signals and washout circuit. **(08 Marks)**

Module-5

9 a. Explain detailed model case II for generator equations. **(08 Marks)**

b. Explain modes of simulation and different solution method. **(08 Marks)**

OR

10 a. Explain about inclusion of load and SVC dynamics. **(08 Marks)**

b. Explain about simultaneous solution of system equation. **(08 Marks)**

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