Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 08

M.Tech. (EE) (2018 & Onwards) (Sem.–1)

POWER SYSTEM DYNAMICS-I

Subject Code : MTEE-102-18

M.Code : 75216

Time : 3 Hrs. **Max. Marks : 60**

INSTRUCTIONS TO CANDIDATES :

1. **Attempt any FIVE questions out of EIGHT questions.**
2. **Each question carries TWELVE marks.**

Q1. a) Explain the angular stability problem of a synchronous machine system. [6]

b) Define per unit system. Write procedure for using per unit system. [6]

Q2. a) Give detailed description of steady state stability evaluation of SMIB System. [6]

b) A generator is connected to an infinite bus through an external impedance of jXe. If Eb = Vto = 1.0 p.u. Find the initial conditions.

Assume xe = 0.28 p.u. Consider the generator data : xd = 1.8, xq = 1.7, x'd = 0.18, x'q = 0.25,Ra = l 0.0', Td' = 0.5 Sec, Tq'' = 0.1 Sec, H = 5 Sec, and T_B = 50Hz. [6]

Q3. a) Express the role of Park's transformation for equations of synchronous machine. [5]

b) Obtain Flux linkage and Voltage equations of a synchronous machine model used in power system dynamic studies. [7]

Q4. a) Write assumptions used in derivation of basic equations for a synchronous machine. [5]

b) Draw two equivalent circuits of synchronous machine corresponding to the two axes *d* and *q*. [7]

Q5. a) Explain the methods of excitation control used for an alternator. [6]

b) Obtain the small signal modelling of a single machine system. [6]

Q6. Express complete block diagram for developing simplified model of synchronous machine. [12]

Q7. a) Draw the block diagram of PSS. [5]

b) Obtain the simplified model of a single machine connected to infinite bus. [7]

Q8. Write short notes on following :

a) Small signal frequency model [4]

b) Philips-Heffron model [4]

c) Prime mover controller. [4]