Total Pages : 3

107805

May 2019
B.Tech. VIIIth Semester
PSS AND FACTS
(EL-426) 2010 Scheme

Time : 3 Hours]

[Max. Marks : 60

Instructions :

(i) *It is compulsory to answer all the questions (2 marks each) of Part-A in short.*

(ii) *Answer any four questions from Part-B in detail.*

(iii) *Different sub-parts of a question are to be attempted adjacent to each other.*

(iv) *Assume any missing Data.*

PART–A

1. (a) Define synchronizing or stiffness coefficient. For what value of synchronizing coefficient the system remains stable. (2)

   (b) What is state, state vector and state equation? (2)

   (c) On what basis can we conclude that synchronous generator goes out of stability? (2)

   (d) Define load angle of generator. (2)

(e) What are the functions of STATCOM in the improvement of power system performance area? (2)

(f) Why does equal area criteria gives only the absolutely stability of power system? (2)

(g) How transient stability limit can be increased? (2)

(h) Define inertia constant M and H for synchronous machine. How they are related? (2)

(i) What are the methods to increase the power transfer capability in a power system? (2)

(j) What is steady state or small signal stability? (2)

PART-B

2. (a) Determine the swing equation of a synchronous machine working on infinite bus. (4)

(b) What is equal area criterion? How it is derived? Explain the operation of synchronous motor using this equation when there is sudden increase in load. (6)

3. (a) What are the factors influencing inter area modes of oscillations? (4)

(b) Explain Euler method for transient stability analysis. (6)

4. (a) Explain the factors affecting voltage stability & voltage collapse. (5)

(b) What is the objective of power system stabilizer and explain how it can improve the stability of the system? (5)

5. (a) Explain state space description of the excitation system.

(4)

(b) Derive the stator voltage equations and rotor voltage equations from the abc frame of reference to dqo reference frame.

(6)

6. (a) Derive equation for critical clearing angle when $P_1 = P_0$ before occurrence of fault taking into account pre fault, during fault and post fault equations. (7)

(b) Define sub-synchronous resonance. What are the counter measures for SSR?

(3)

7. (a) Derive the dynamic equation of generator with classical model.

(6)

(b) Explain series and shunt compensation.

(4)

———————