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B.Tech. 8th Semester

Power System Stability and Facts (EL-426)

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 data if missing.

PART–A

1. (a) A salient pole machine is more stable than a cylindrical rotor machine, why? (2)

(b) Give the difference between the STATCOM and SVC. (2)

(c) What is the influence of compensating device on voltage stability? (2)

(d) Define the term voltage instability. (2)

(e) Discuss the causes of voltage collapse. (2)

(f) Define the following term 1. Participation factor 2. Mode shape. (2)

(g) Define Eigen value sensitivity. (2)

(h) What is the effect of field flux linkage on system stability? (2)

(i) Define critical clearing angle. (2)

(j) What is the need of flexible ac transmission system? (2)

PART–B

2. (a) Derive the expression for stator and rotor flux linkages in dqo components. What is physical interpretation of dqo transformation? (5)

(b) Derive Swing equation. What are its limitations? (5)

3. (a) Explain the function of power system stabilizer for enhancing small signal stability? (5)

(b) Explain various preventive measures to SSR problems. (5)

4. (a) Explain the term transient stability. Discuss second order R-K method. What are its limitations? (5)

(b) Describe the effects of AVR on synchronizing and damping torque components? (5)

5. (a) Explain the principle of operation of STATCOM in power system? (5)

(b) Discuss the difference between rotor angle stability and voltage stability? (5)

6. (a) Explain Torsional interaction effect? (5)

(b) Explain any static method for voltage stability analysis. (5)

7. (a) Explain self-excitation. How it can be prevented? (5)

(b) Explain the principle of operation and application of Static VAR system in a power system. (5)