28/9/13.

B.E./B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, NOV / DEC 2013 37

ELECTRICAL AND ELECTRONICS ENGINEERING

SEMESTER VIII – (REGULATIONS 2008)

EE9035 – POWER SYSTEM TRANSIENTS

Time:3 hrs Max Marks:100

Answer ALL Questions

Part A – (10×2=20)

1. Mention various sources of power system transients
2. Explain briefly about double frequency transients
3. What is meant by current chopping?
4. How does ferroresonance occur?
5. Define overvoltage
6. Give the advantage of ground wires
7. When a voltage wave is travelling towards an open ended line, what is the expected voltage magnitude at the open end?
8. Distinguish between lumped and distributed parameters
9. What is meant by load rejection?
10. Write briefly about EMTP.

Part B – (5×16=80)

11. (i) Classify different types of overvoltages based on their waveshapes. Explain the importance of grounding in transient studies. (16)

12. a. (i)Explain the basic principle for generating switching transient? (4)

(ii) Discuss the causes for switching overvoltages? How are they controlled in power systems? (12)

OR

b. (i) What is meant by load switching? Discuss the effects, with equivalent circuit, when a high power factor load is switched on in power system. (8)

(ii) Write short notes on capacitance switching. (8)

13. a.How does overvoltage occur due to lightning? Describe mechanism of direct and indirect lightning. Which type of lightning is considered as more important for design of transmission and distribution lines? Explain. (16)

OR

b.(i) Mention and explain the characteristics of lightning? (8)

(ii) State the factors with respect to lightning, which contribute for the protection of power system. (8)

14. a. (i) Derive the expressions for reflected and transmitted voltage when the line is terminated with a capacitor. (8)

(ii) An infinite rectangular wave on a line having a surge impedance of 500 Ω strikes a transmission line terminated with a capacitance of 0.004 μF. Calculate the extent to which the wave front is retarded? (8)

OR

b. (i) State the significance of Bewley's lattice diagram (6)

(ii) A long transmission line is energized by a unit step voltage 1.0 V at the sending end and is open circuited at the receiving end. Construct the Bewley's lattice diagram and obtain the value of the voltage at the receiving end after three reflections. Take the attenuation factor as 0.8. (10)

15. a. Assume suitable network and describe the distribution of voltage in a power system when a kilometric fault occurs? Draw suitable waveforms also. (16)

OR

b. Assume suitable power network and explain possible switching surges on an integrated system. (16)