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B.E / B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL / MAY 2013

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

VIII Semester

EE9035 Power System Transients

(Regulation R2008)

Time : 3 Hours

Answer ALL Questions

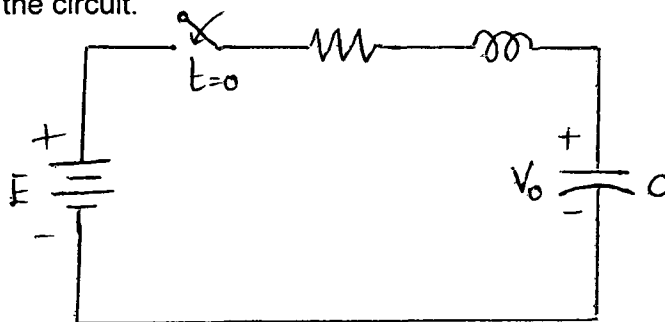
Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. What is Current Chopping?
2. Explain the phenomenon of Ferro resonance.
3. As a consequence of closing of a switch in a series RC circuit the voltage across the capacitor is $V_1 = V - [V - V_1(0)]e^{-t/RC}$. What does the first and second term represent?
4. What are the factors contributing to Good Line Design?
5. What is Resistance switching?
6. Draw the voltage and current waveforms during capacitance switching with the restrike at peak voltage.
7. Differentiate travelling waves and standing waves
8. List the importance of study of transients in planning.
9. What are switching surges?
10. Write about the overvoltages induced by Load Rejection.

Part – B (5 x 16 = 80 marks)

11. A step voltage $V(t) = 100 u(t)$ is applied to a series RLC circuit with $L = 10H$, $R = 2\Omega$ and $C = 5F$. The initial current in the circuit is zero, but there is an initial voltage of 50V on the capacitor in a direction which opposes the applied source. Find the expression for the current in the circuit.



12. a) i) What are the various types of power system transients? (8)
ii) Considering a circuit with two natural frequencies, derive the current across the capacitors (8)
- OR
- b) i) What are the effects of transients in power system? (8)
ii) Explain with the voltage and current waveforms the concept of Capacitance Switching showing the effect of source regulation. (8)

13. a) Explain in detail the interaction between lightning and power system
OR
b) Explain in detail the charge formation in clouds.
14. a) Explain the Reflection and Refraction of travelling waves. Draw the voltage and current waves being reflected and refracted at a junction between two lines.
OR
b) A long Transmission line is energized by a unit step voltage 1.0V at the sending end and is open circuited at the receiving end. Construct the Brewley's Lattice diagram and obtain the value of the voltage at the receiving end after a long time. Take the attenuation factor $\alpha=0.8$.
15. a) Considering a kilometric fault on a transmission line, explain the distribution of voltage on the faulted system and derive the response of the shorted line.
OR
b) Write in detail about the overvoltages induced by Line to Line Fault.