

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025***Seventh Semester**Electrical and Electronics Engineering***EE3037 - Power System Transients***Regulations - 2021**Duration : 3 Hrs**Maximum : 100 Marks***PART - A (ANSWER ALL QUESTIONS) (Marks 10*2=20)**

<i>Q.No</i>	<i>Questions</i>	<i>BTL</i>	<i>CO</i>	<i>Marks</i>
1.	List the different sources of transients in power systems.	L1	1	2
2.	Define double frequency transients? Show the conditions under which they occur in power systems.	L1	1	2
3.	Differentiate between normal switching transients and abnormal switching transients.	L2	2	2
4.	State the phenomenon of current suppression during switching.	L2	2	2
5.	Mention the different factors contributing to good line design for protection against lightning.	L1	3	2
6.	What is tower footing resistance?	L1	3	2
7.	Define a traveling wave. How is it formed in transmission lines?	L1	4	2
8.	Express the condition for resonance in terms of standing waves and natural frequencies.	L2	4	2
9.	Outline the concept of short line faults and kilometric faults in power systems.	L2	5	2
10.	Compare between switching surges and lightning surges.	L2	5	2

PART - B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
11.	a Interpret the transient response of an RL circuit excited by a sinusoidal voltage source. Derive the mathematical expression for the transient current.	L3	1	16
	Or			
	b i Infer the role of transients in power system planning.	L3	1	8
	ii Examine the importance of grounding in mitigating transients.	L3	1	8
12.	a Describe resistance switching in detail. Draw the equivalent circuit for interrupting a resistive current and explain its operation.	L2	2	16
	Or			
	b i Discuss the phenomenon of capacitance switching with restriking and explain its effect on system transients.	L2	2	8
	ii Explain the phenomenon of ferroresonance in power systems. Describe the conditions under which ferroresonance occurs in switching circuits.	L2	2	8

13.	a	Elaborate the different theories of cloud formation. How do these contribute to lightning phenomena?	L2	3	16
		Or			
	b i	Discuss the role of ground wires in protecting transmission lines from lightning strikes.	L2	3	8
	ii	Describe the interaction between lightning and power system components.	L2	3	8
14.	a	Examine the methods used for computation of transients in power systems. Derive the transient response of a system with series lumped parameters when subjected to a sudden disturbance.	L4	4	16
		Or			
	b	Analyze the concept of Bewley's lattice diagram with a neat diagram. Construct a Bewley's lattice diagram for a line terminated with a short circuit and explain the wave reflections.	L4	4	16
15.	a	Construct the phenomenon of line dropping and load rejection in an integrated power system. Explain its causes and the resulting transient effects on power systems.	L3	5	16
		Or			
	b	Evaluate the qualitative application of EMTP for transient computation in power systems. Explore the types of transients can be effectively studied using EMTP.	L3	5	16