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MEPS-205

M. E./M. Tech. (Power Systems) (Second Semester)

EXAMINATION, June, 2011

(Grading/Non-Grading)

POWER SYSTEM TRANSIENTS

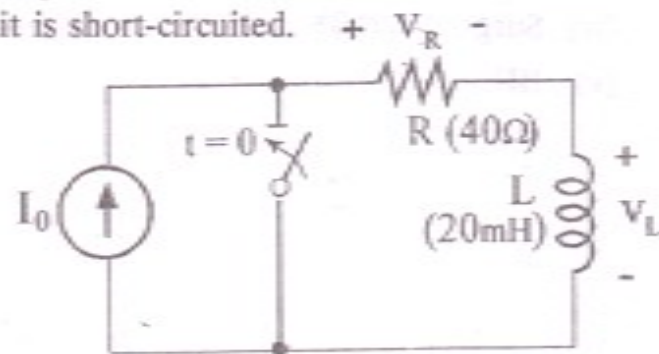
(MEPS - 205)

Time : Three Hours

Maximum Marks : $\begin{cases} GS : 70 \\ NGS : 100 \end{cases}$

Note : Attempt any *five* questions. All questions carry equal marks.

- How will you classify transients in power systems ? Explain.
- Consider the RL circuit in figure which is fed by a d. c. current source $I_0 = 5$ A. At instant $t = 0$ the switch is closed and the circuit is short-circuited.



Find :

- The current after switching, by separating the variables and applying the definite integrals
- The voltage across the inductance

[2]

- Explain the voltage stress developed in circuit breaker due to short line faults. How can it be controlled ?
- Distinguish between reignition, restriking, prestrikes and current chopping in high voltage circuit breaker.
- (a) Explain trapped charges and its effects.
(b) Solve the differential equation using Z-transforms :
$$y_k + 3 - 3y_{k+2} + 3y_{k+1} - y_k = 4(k)$$
- Discuss in detail about simulation tools for electromagnetic transients in power systems.
- (a) State the techniques to solve the equations of a multiconductor frequency dependent overhead line. Explain any *one* technique.
(b) Explain the basic principle of insulation coordination.
- Write short notes on any *three* of the following :
 - Tower footing resistance
 - Energization of an unloaded transmission line
 - Lightning surges
 - Surge diverters
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