Student Name: _____   Reg. No. 2019-EE-383

EE110 Circuit Analysis and Design
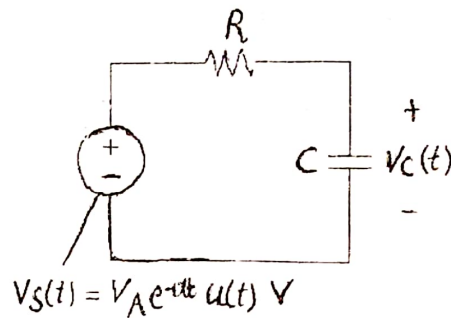Fall 2022, Session 2021 (3rd Semester)
Final Exams

Time Allowed: 90 Minutes
Total Marks: 40

➤ All the related parts of a question must be solved together.
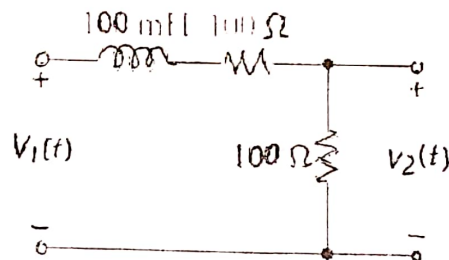➤ Understanding of question is part of exam.

Q.1	**Analyze** the circuit in figure below and use Laplase/Inverse Laplase to find $v_c(t)$.	10

$$V_S(t) = V_A e^{-\alpha t} u(t) \ V$$

Q.2	**Evaluate** the circuit in figure below and:	

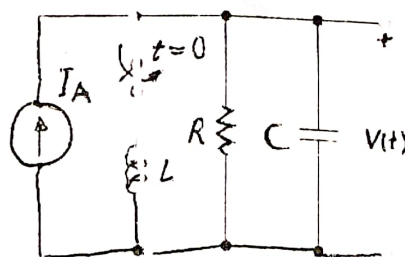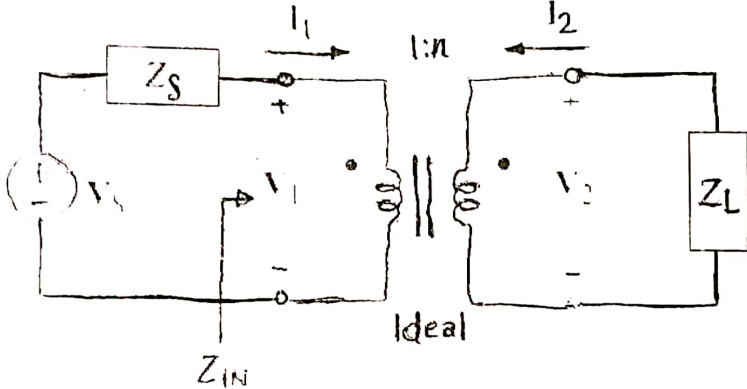|	A	Find the transfer function $T_V(s) = V_2(s)/V_1(s)$	1
	B	Find the DC gain, infinity frequency gain, and cut-off frequency. Identify the type of gain response.	4
	C	Sketch the straight line approximations of the gain and phase responses (Bode plots).	4
	D	Calculate the gain at $\omega = 0.5\omega_c$ and $2\omega_c$	1

Q.3	The switch in circuit of figure below has been closed for a long time. At t = 0 the switch is suddenly opened.	

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A	**Evaluate** the circuit to find the transform $I_R(s)$ for the current through the resistor (Use Circuit Transformation).	7
B	**Select** values of R, L and C so that the current reaches at least 63% of its final value in 100ms or less.	3
Q.4	The turns ratio of the ideal transformer in figure below in $n = 5$. The source and load impedances are $Z_S = 2.5+j1.5\ \Omega$ and $Z_L = 75+j10\ \Omega$. **Analyze** the circuit to find I_1, V_1, I_2 and V_2 when the input is $V_S = 220\ \angle 0°\ V$.	10

CLO4