Hall Ticket Number:

1	6	0	2	2	0	7	3	4	0	5	1

Code No. : 13348 S

VASAVI COLLEGE OF ENGINEERING *(AUTONOMOUS)*, HYDERABAD

Accredited by NAAC with A++ Grade

B.E. (E.E.E.) III-Semester Supplementary Examinations, August-2022

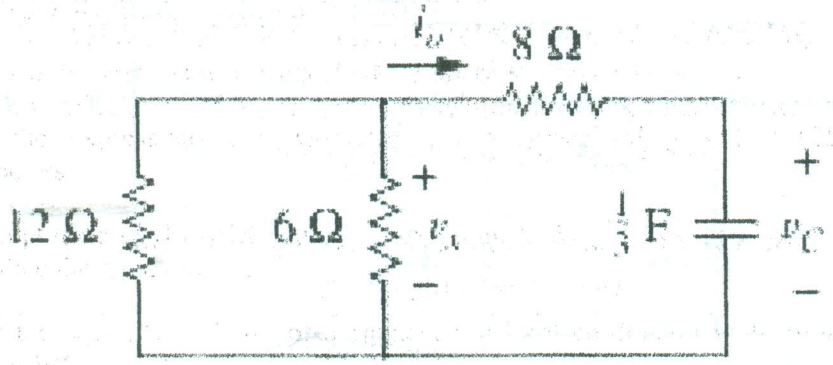
Electrical Network Analysis

Time: **3 hours** Max. Marks: **60**

*Note: Answer all questions from **Part-A** and any **FIVE** from **Part-B***

Part-A (10× 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	Define impulse and step input functions.	2	1	1	1
2.	Differentiate transient response and steady state response.	2	1	1	1
3.	Under what conditions, response of RLC series circuit for step input is: i) under damped ii) over damped.	2	1	1	1
4.	Give any two applications of second order circuits.	2	1	1	2
5.	Define quality factor of a resonant circuit.	2	1	2	1
6.	Compare linear transformer and ideal transformer.	2	2	3	2
7.	Give the expressions for symmetry and reciprocal of y and ABCD parameters.	2	1	4	2
8.	A two-port network is defined by the relation: $I_1=5V_1 + 3V_2$, $I_2=2V_1-7V_2$. Calculate the z-parameters.	2	4	4	2
9.	Draw the equivalent circuit of a capacitor in Laplace domain with initial voltage V(0).	2	1	5	2
10.	Define transfer function.	2	1	5	1
	Part-B (5 × 8 = 40 Marks)				
11. a)	From the fundamentals, obtain the step response of a series RL circuit.	4	2	1	2
b)	For the circuit shown below, let Vc(0) = 60 V. Determine Vc, Vx and i_0 fort > 0.	4	4	1	2



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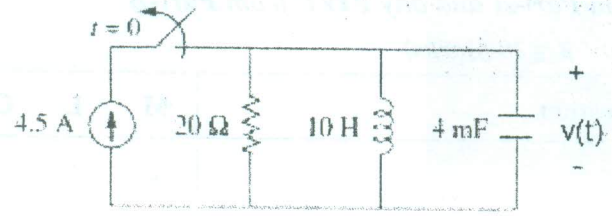
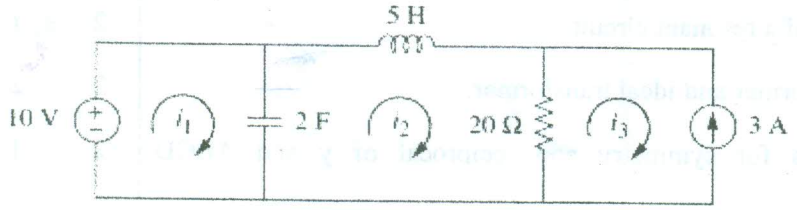
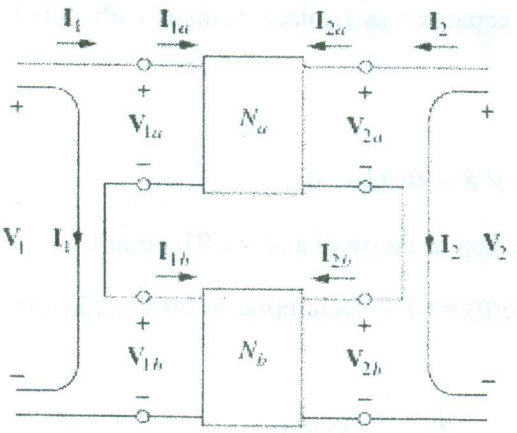
12. a)	Derive the expression for circuit current of a series RLC circuit excited by step input.	4	2	1	2
b)	In the circuit shown below, find v(t) for t > 0.	4	4	1	2



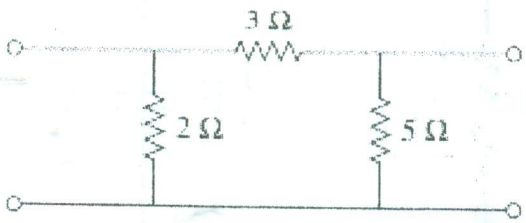
13. a)	Derive the expression for half power frequencies of an RLC series circuit.	4	2	2	2
b)	Explain the procedure to construct a dual circuit. Also obtain the dual of the circuit shown below.	4	2	3	2



14. a)	Consider the series connection of two-port networks shown in Figure below. Show that [Z] = [Za]+[Zb].	4	2	4	2



b)	Determine the h-parameters for the circuit shown below.	4	4	4	2



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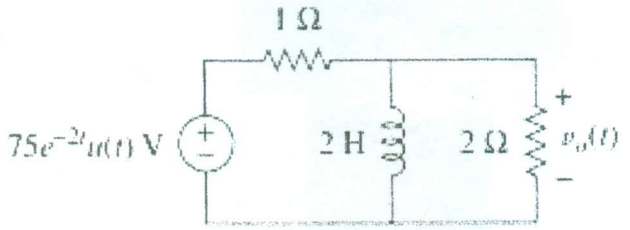
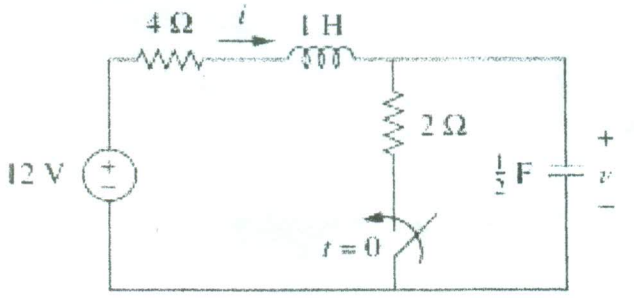
15. a)	State and explain convolution theorem.	4	2	5	2
b)	Find $v_0(t)$ for the circuit shown below. Assume zero initial conditions.	4	4	5	2



16. a)	A simple RL series circuit is excited by a sinusoidal voltage source. The circuit is initially relaxed. At t=0, the switch is closed find the response i(t) for the current. Source voltage is VmCos(ωt+ϕ).	4	2	1	2
b)	Find the complete response 'v' for t > 0 in the circuit shown below	4	4	1	2



17.	Answer any ***two*** of the following:				
a)	Derive an expression for energy stored in a coupled circuit.	4	3	3	2
b)	The Z-parameters of a two- port network are Z_{11}=15 Ω, Z_{12}=Z_{21}=6 Ω and Z_{22}=24 Ω. Determine the ABCD parameters.	4	4	4	2
c)	The output of a linear system is $y(t) = 10\ e^{-t} \cos 4t\ u(t)$ when the input is $x(t) = e^{-t}\ u(t)$. Find the transfer function of the system and its impulse response.	4	4	5	2

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	37.50%
iii)	Blooms Taxonomy Level – 3 & 4	42.50%

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