

Hall Ticket Number:

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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

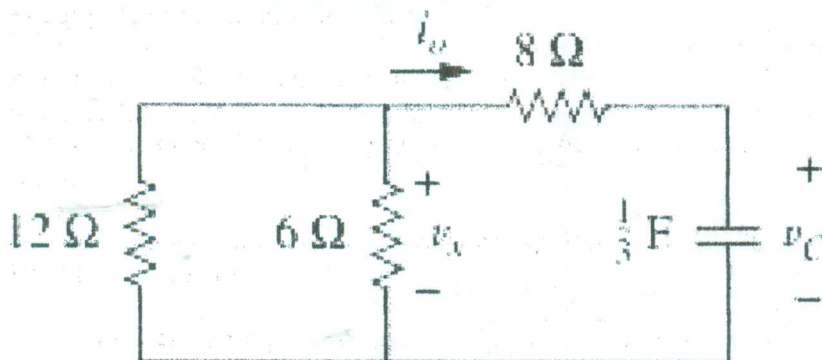
Time: 3 hours

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
<b>Part-B (5 × 8 = 40 Marks)</b>					
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 $V_c(0) = 60$ V. Determine $V_c$ , $V_x$ and $i_0$ for $t > 0$ .	4	4	1	2



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 $V_m \cos(\omega t + \phi)$ .	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 <i>two</i> 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 $Z_{11}=15 \Omega$ , $Z_{12}=Z_{21}=6 \Omega$ and $Z_{22}=24 \Omega$ . 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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