1	6	0	2	2	2	9	3	5	1	1	3

Code No. : 12426 AS N/O

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD
Accredited by NAAC with A++ Grade
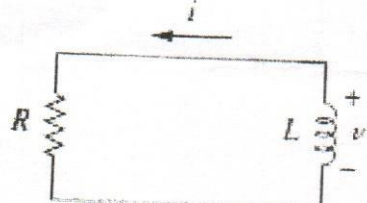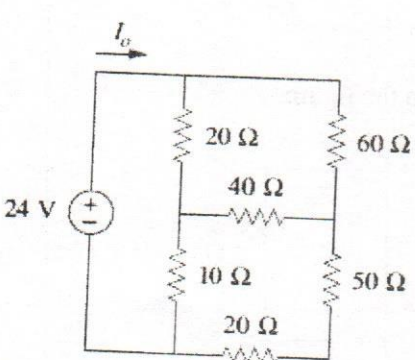### B.E. (E.C.E.) II-Semester Advanced Supplementary Examinations, September-2023
## Basic Circuit Analysis

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	PSO
1.	Draw the circuits of dependent voltage and current sources.	2	1	1	1	1
2.	A stove element draws 15 A, when connected to a 240-V line. Determine the time it takes to consume 180 kJ.	2	1	1	2	1
3.	State compensation theorem. Mention its applications.	2	1	2	1	1
4.	Define Kirchhoff's current and voltage laws.	2	1	2	1	1
5.	The ABCD parameters of a reciprocal two port network are given as A =1, B=2 and C=3. Calculate the D parameter.	2	1	3	1	1
6.	Determine the h_{12} parameter from the given two port network equations: $V_1 = 5I_1 + 2I_2$, $V_2 = 2I_1 + I_2$	2	2	3	2	1
7.	Define zero input and zero state response.	2	1	4	1	1
8.	For the circuit shown in Figure, $v = 100$ V and $i = 25$ A. Find the value of L and R.	2	2	4	2	1

Q. No.	Stem of the question	M	L	CO	PO	PSO
9.	Define quality factor of a resonant circuit. Write its significance.	2	1	5	1	1
10.	What are passive filters? Write classification of filters.	2	1	5	2	1

Part-B (5×8 = 40 Marks)

		M	L	CO	PO	PSO
11. a)	Calculate Io in the circuit shown in below figure, using network reduction techniques.	4	2	1	3	1

b) For the circuit shown in figure, use KCL to find the branch currents I_1, I_2, I_3 and I_4.
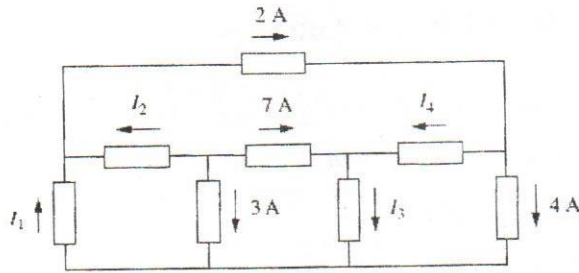
4	2	1	2	1

12. a) Determine the Thevenin's equivalent at terminals a-b of the circuit shown in figure:
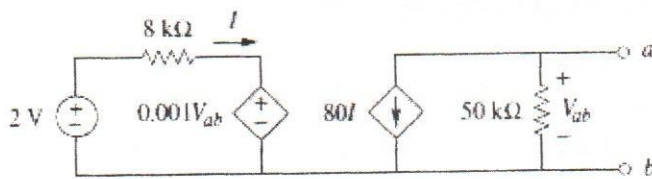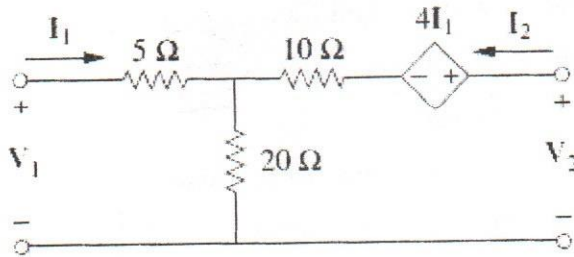
4	2	2	3	1

b) Compute the value of R that results in maximum power transfer to the 10Ω resistor shown in figure.

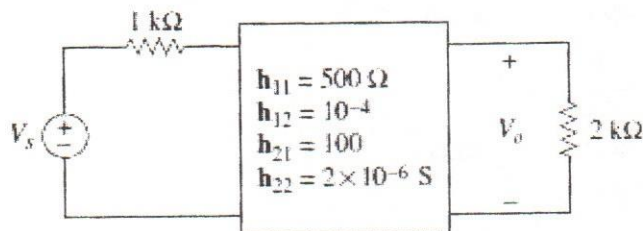Find the maximum power delivered to 10Ω resistor.
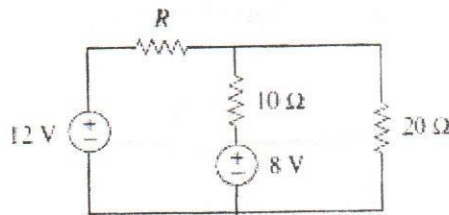
4	3	2	4	1

13. a) Compute the z- parameters of the circuit shown in figure.

4	3	3	3	1

b) Determine V_o/V_s. for the network shown in the figure,

4	3	3	4	1

$h_{11} = 500 \Omega$
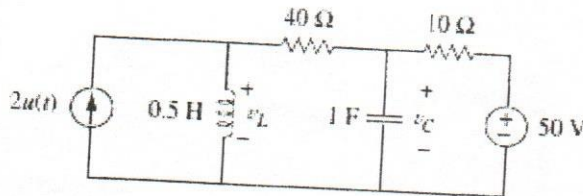$h_{12} = 10^{-4}$
$h_{21} = 100$
$h_{22} = 2 \times 10^{-6}$ S

14. a) The switch is opened instantaneously at t=0 .Find $v(t)$ for $t > 0$ in the circuit shown in figure   4 3 4 3 1
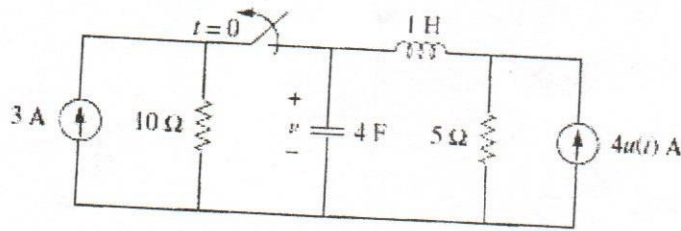
b) Consider the circuit shown in figure, Find $V_L(0^+)$, $V_c(0^+)$, $V_L(\infty)$ and $V_c(\infty)$.   4 2 4 3 1
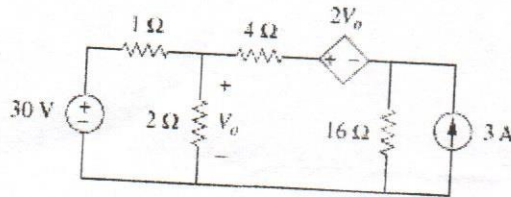

15. a) Prove that RC low pass filter will act as Integrator.   4 3 5 4 1

b) A parallel resonant circuit has R=100KΩ, L=20mH and C=5nF. Calculate $\omega_0, \omega_L, \omega_H, Q$, and B.   4 2 5 3 1

16. a) Find Vo in the circuit shown in figure, using nodal analysis   4 2 1 4 1

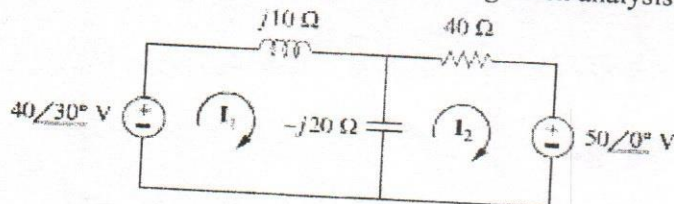**b)** State and prove reciprocity theorem with an example.   4 3 2 3 1

17. Answer any **two** of the following:

a) Prove that z- parameters for the overall network are the sum of the z-parameters for the individual networks, when connected in series.   4 3 3 3 1

b) Find I_1 and I_2 in the circuit shown in figure, using Mesh analysis.   4 2 4 4 1

c) Draw the step response of RC high pass filter and derive the expression for output voltage.   4 3 5 2 1

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

i)	Blooms Taxonomy Level – 1	
ii)	Blooms Taxonomy Level – 2	20%
iii)	Blooms Taxonomy Level – 3 & 4	40%
		40%

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