Hall Ticket Number:

Code No. : 13458 S O

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD
Accredited by NAAC with A++ Grade
B.E. (E.C.E.) III-Semester Supplementary Examinations, August-2023
Network Analysis and Transmission Lines

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.	State the maximum power transfer theorem	2	1	1	1,PSO 1
2.	Find the Y_{12} and Y_{21} parameters for the T network shown in below figure.	2	3	1	2, PSO 1
3.	What is the significance of initial conditions of energy storing elements in circuit analysis	2	1	2	1, PSO 1
4.	Differentiate between Zero State Response and Zero Input Response	2	2	2	1, PSO 1
5.	Determine the cut-off frequency of the constant k-filter given in the below figure.	2	3	4	2, PSO 1
6.	What is meant by resonance? Differentiate between series and parallel resonance circuits.	2	2	3	1, PSO 1
7.	Define wavelength and velocity of propagation of a transmission line	2	1	5	1, PSO 1
8.	How to eliminate the frequency distortion that occur in transmission lines	2	2	5	1, PSO 1
9.	Give the significance of Smith Chart.	2	1	6	1, PSO 1
10.	What is the value of characteristic impedance of a quarter wave transmission line to match 120 ohm load to the 75 ohm line	2	2	6	1, PSO 1

Part-B (5×8 = 40 Marks)

11. a)	Describe reciprocity theorem and derive the condition for reciprocity of a two port network	4	2	1	1, PSO 1
b)	Find the h parameters of the network given below.	4	3	1	2, PSO 1
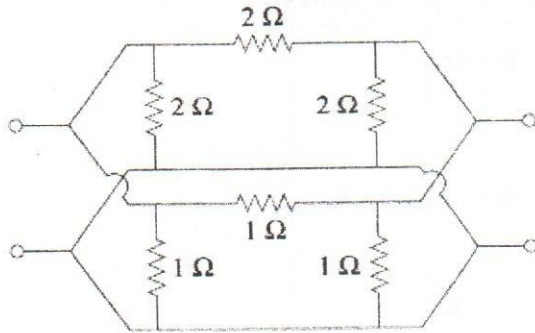
12. a)	Evaluate the time constant of an RL circuit.	4	2	2	1, PSO 1
b)	Find v(t) for $t \geq 0$. Calculate the initial energy stored in the capacitor.	4	3	2	2, PSO 1
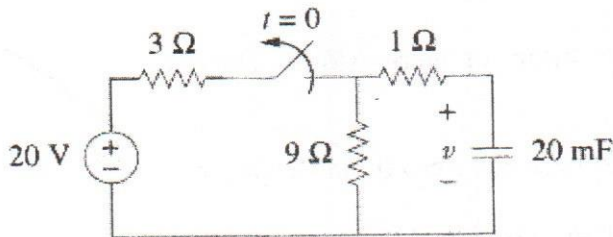
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13. a)	Design a T-section m-derived high pass filter with a cutoff frequency of f_c =20KHz, design impedance of 400 Ω and given m=0.2.	4	3	4	2, PSO 1
b)	A series resonant circuit has R=2 Ω, L=1mH and C=0.3µF. Determine the bandwidth, resonant frequency and Q factor when the input signal of $20\sin\omega t$ is applied.	4	3	3	2, PSO 1
14. a)	Derive an input impedance expression for short and open circuited transmission lines	4	2	5	3, PSO 1
b)	The Characteristic Impedance of a uniform transmission line is 2039.6 Ω at a frequency of 800Hz. At this frequency the propagation constant was found to be $0.054\angle 87.9^0\,\Omega$. Determine the values of primary constants.	4	3	5	2, PSO 1
15. a)	Determine the input impedance for λ/2,λ/4, λ/8 lines and brief their characteristics	4	2	6	3, PSO 1
b)	Compute the VSWR of a 75 ohm transmission line when it is terminated by a load impedance of 50+j30 ohm	4	3	6	2, PSO 1

16. a)	Explain the impedance parameters and convert Z-parameters to h-parameters	4	1	1	1, PSO 1
b)	The switch in the circuit of figure shown below has been closed for a long time. At t = 0, the switch is opened. Calculate i(t) and V_L at t =1ms.	4	3	2	2, PSO 1
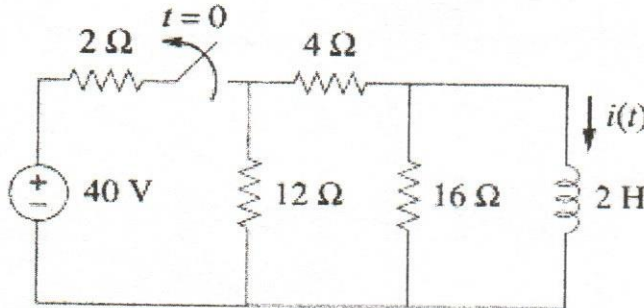
17.	Answer any *two* of the following:				
a)	Draw the block diagram of composite filter and explain each block	4	1	4	1, PSO 1
b)	Prove that a transmission line of finite length terminated by its characteristic impedance is equivalent to an infinite line.	4	2	5	3, PSO 1
c)	Outline the significance of impedance matching and list various impedance matching devices used in transmission lines	4	2	6	1, PSO 1

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

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

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