GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Third Semester - Regular) Examinations, December – 2022

21BECPC23003 / 21BELPC23002 / 21BEEPC23002 – NETWORK THEORY

(ECE, EE & EEE)

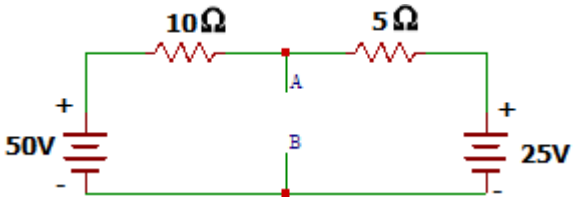
Time: 3 hrs Maximum: 70 Marks

Answer ALL questions

(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

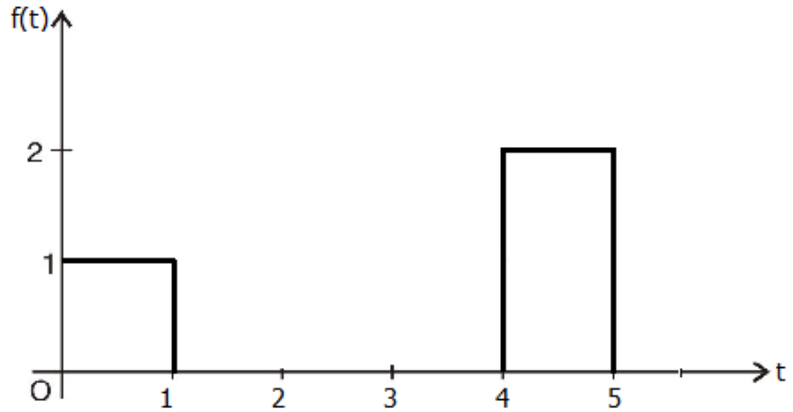
Q.1. Answer ***ALL*** questions	CO #	Blooms Level
a. State the theorem on laws of conservation of energy?	CO4	2
b. Determine the equivalent Thevenin's resistance between terminals A and B in the circuit shown below.	CO1	3



c. What is Hurwitz criterion of stability of network function?	CO4	2
d. If the value of resonant frequency is 50 kHz in a series RLC circuit along with the bandwidth of about 1 kHz, then what would be the value of quality factor?	CO2	3
e. If z-parameters are $z_{11} = 40$, $z_{22} = 50$ and $z_{12} = z_{21} = 20$, what would be the value of y_{22}.	CO3	3

PART – B **(15 x 4 = 60 Marks)**

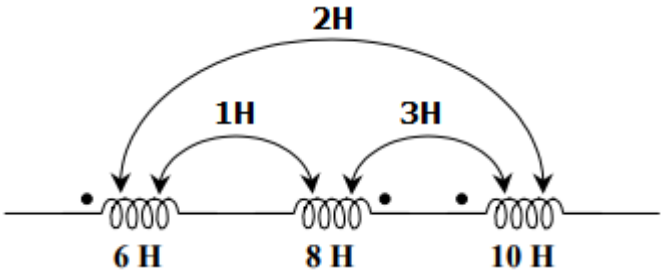
Answer ***ALL*** the questions	Marks	CO #	Blooms Level
2. a. Determine the Laplace transform of the waveform shown in figure.	8	CO4	3



b. A pure inductance of 150 mH is connected in parallel with a 40 μF capacitor across a 50 V, variable frequency supply. Determine (a) the resonant frequency of the circuit and (b) the current circulating in the capacitor and inductance at resonance.	7	CO2	2

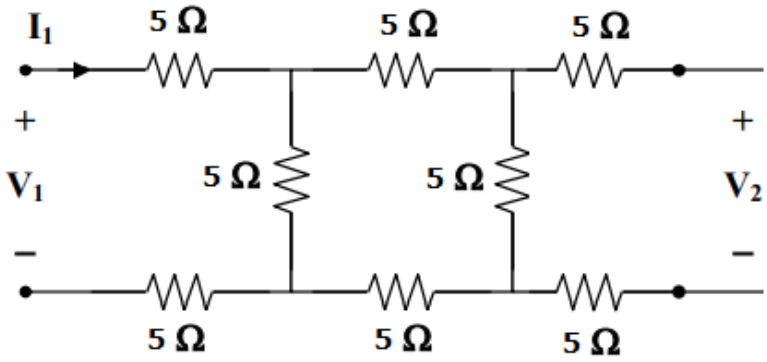
(OR)

c. For three coupled coils shown in figure. Calculate the total inductance.	8	CO2	3

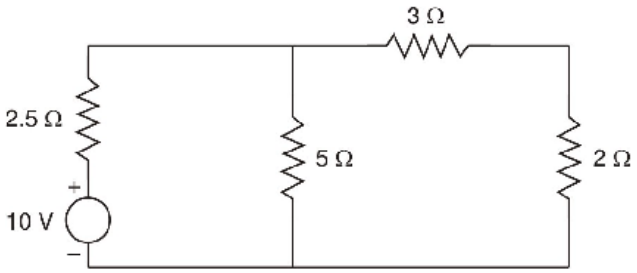


d. State and explain Reciprocity theorem with examples. What are the limitations of this theorem? 7 CO1 2

3.a. Find out impedance parameter of two port network. 8 CO3 3



b. For the circuit shown in figure, the resistance of 5Ω changes to 2Ω. Calculate the compensation source and verify the results. 7 CO1 3

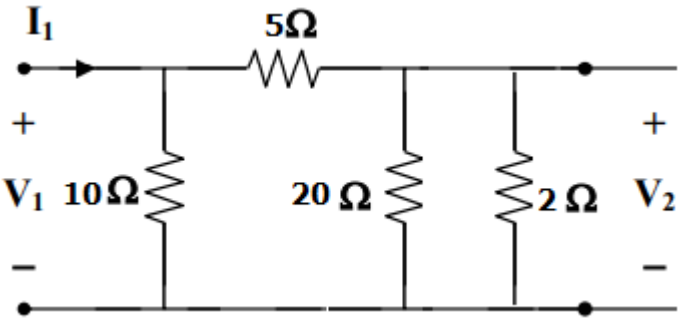


(OR)

c. What is Initial & final value theorem. Find initial value & final value of the transfer function $F(s) = \frac{2(S+1)}{S(S+2)(S+4)}$ 8 CO4 2

d. State and explain maximum power transfer theorem. 7 CO1 2

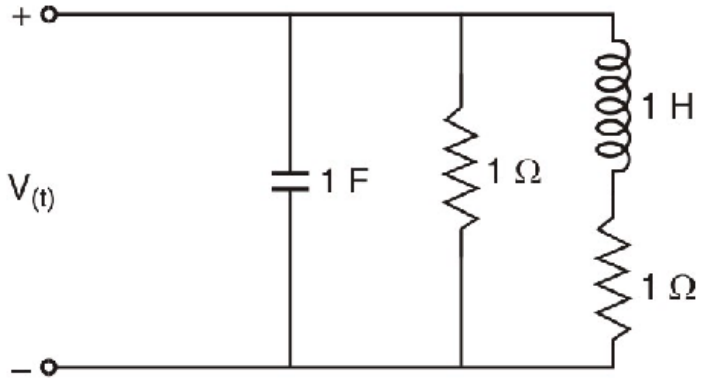
4.a. Determine short circuit parameters for the network shown in figure. 8 CO3 3



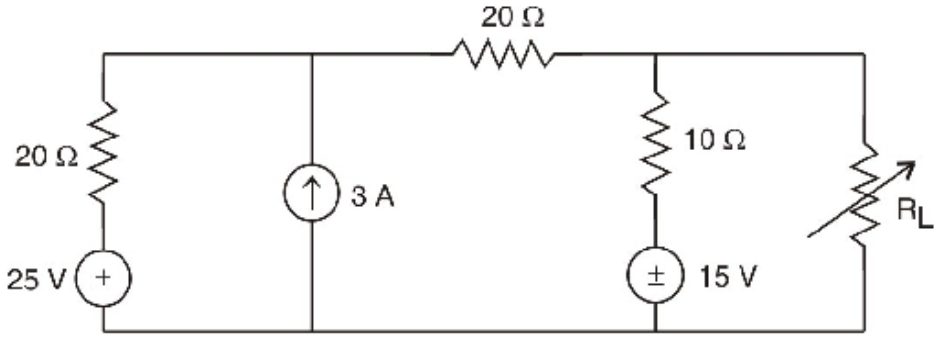
b. Explain restrictions of pole & zero on location of driving point impedance function. 7 CO4 2

(OR)

c.	Determine the driving point admittance Y(s) for the network shown in figure. Draw pole zero plot.	8	CO4	3



d.	A series RLC circuit is resonant at 1 Megacycle/sec. its bandwidth is 5000cps & input impedance at resonance is 50 ohms. Find values of R,L,C.	7	CO2	2
5.a.	Determine R_L for maximum power absorbing from the source and also obtain maximum power for the circuit shown in figure.	8	CO1	2

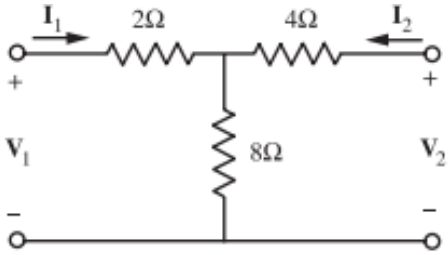


b.	Check whether the polynomial is Hurwitz or not.	7	CO4	3

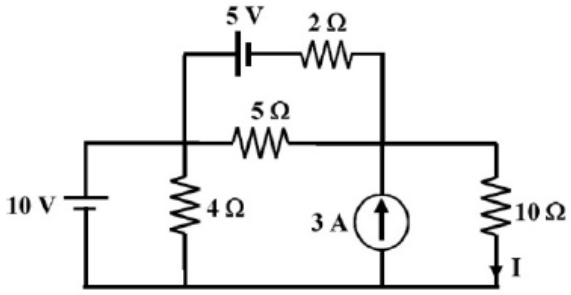
$$F(s) = s^4 + s^3 + 6s^2 + 3s + 6$$

(OR)

c.	Find the hybrid parameter of two port network shown in figure.	8	CO3	3



d.	Find the current I using superposition theorem.	7	CO1	2



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