GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Third Semester Regular) Examinations, December – 2023

22BELPC23002 / 22BEEPC23002 – Network Theory

(EE & EEE)

Time: 3 hrs | Maximum: 70 Marks

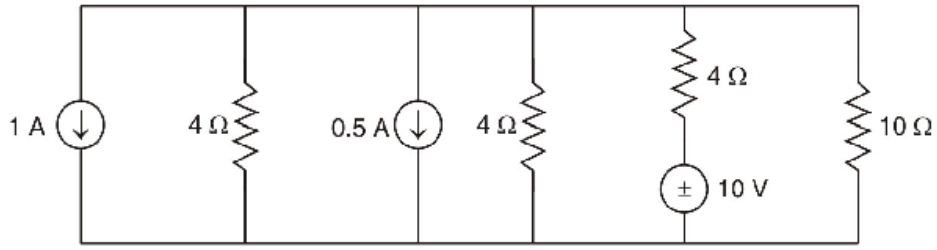
(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

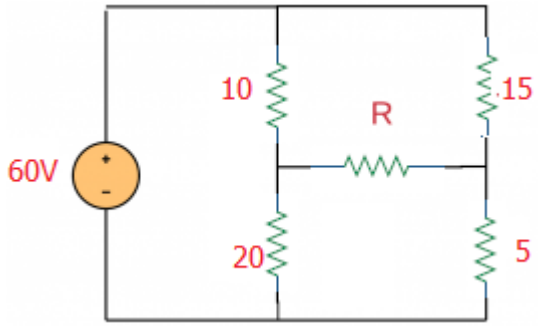
		CO #	Blooms Level
Q.1.	Answer ***ALL*** questions		
a.	A resistor of 3 kΩ, a 0.05 μF capacitor, and a 120 mH coil are in series across a 5 kHz, 20 V ac source. What is the impedance expressed in polar form?	CO2	K3
b.	Write some applications of maximum power transfer theorem.	CO1	K4
c.	A two-port device is defined by the following pair of equations $I_1 = 5V_1 + 2V_2$, $I_2 = 3V_1 + 4V_2$. Write its impedances parameter Y11.	CO3	K2
d.	Explain why the voltage across a capacitor cannot change instantaneously.	CO4	K3
e.	Test the positive realness. $$F(s) = \frac{s^2 + 8s + 5}{s + 2}$$	CO2	K3

PART – B **(15 x 4 = 60 Marks)**

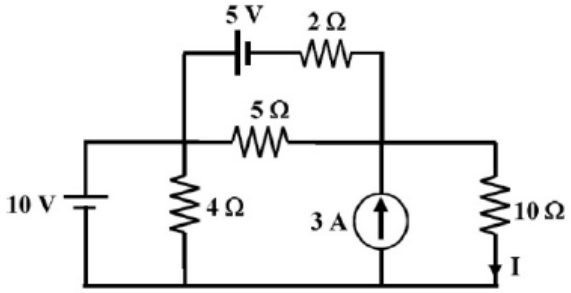
		Marks	CO #	Blooms Level
	Answer ***ALL*** questions			
2. a.	Calculate the current through 10Ω and voltage drop across it for the circuit shown in fig by using Millman's Theorem.	7	CO1	K3



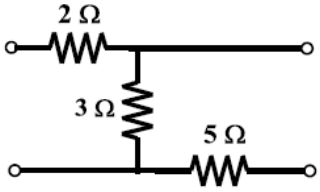
b.	A pure inductance of 150 mH is connected in parallel with a 40 μF capacitor across a 50 V, variable frequency supply. Determine (i) the resonant frequency of the circuit and (ii) the current circulating in the capacitor and inductance at resonance.	8	CO2	K2
	(OR)			
c.	Determine the maximum power that can be delivered to the variable resistor R.	7	CO1	K3



d.	Find the current I using superposition theorem.	8	CO1	K2



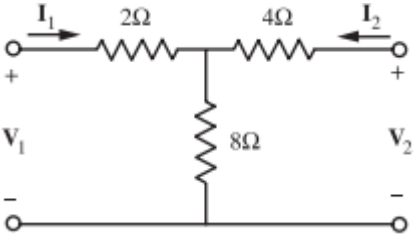
3.a.	If two of such 2-port networks shown in figure are connected in series find the Z parameters of the equivalent circuit.	7	CO3	K3



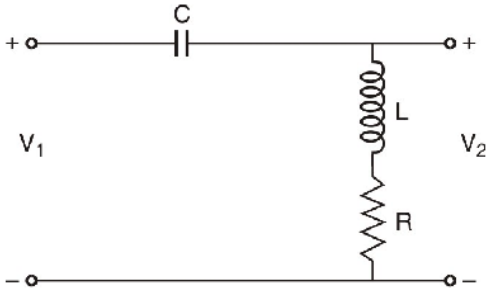
b.	Obtain Y- and h- parameter, if the other parameters are given below: A=2, B= -1, C=3, and D= -2.	8	CO3	K3

(OR)

c.	Find the hybrid parameter of two port network shown in figure.	7	CO3	K3

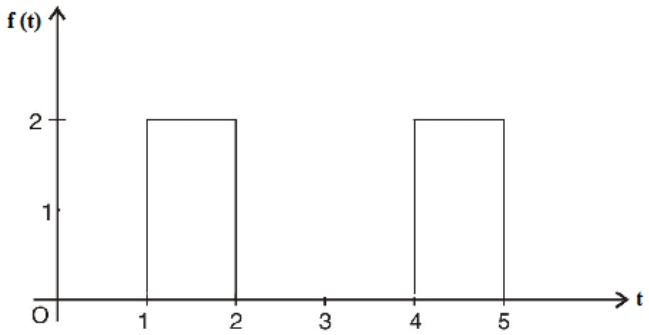


d.	For a 2-port network express ABCD parameter in terms of Y Parameter.	8	CO3	K3
4.a.	What is Initial & final value theorem. Find initial value & final value of the transfer function $F(s) = \frac{2(S+1)}{S(S+2)(S+4)}$	8	CO4	K2
b.	Find voltage transfer function and driving point impedance of the network shown in figure.	7	CO4	K3

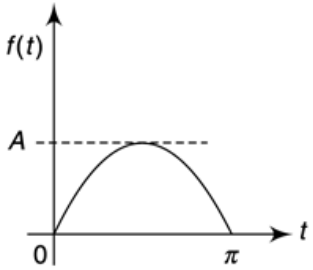


(OR)

c.	Explain restrictions of pole & zero on location of driving point impedance function.	8	CO4	K2
d.	Determine the Laplace transform of the waveform shown in figure.	7	CO4	K3



5.a. Determine the Fourier transform of one cycle of sine wave, f(t) = A sinω_ot. 7 CO1 K3

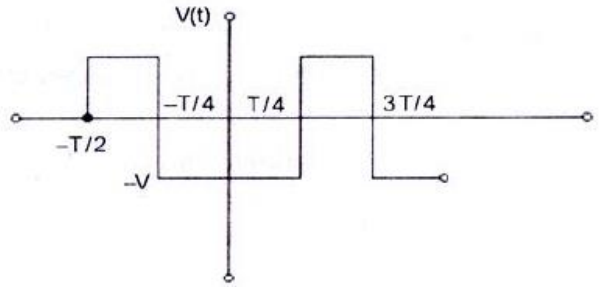


b. Realise the network by using Cauer 1st form of realisation for the function 8 CO4 K3

$$Z(s) = \frac{8s^5 + 5s^3 + 3s}{s^4 + 3s^2 + 1}$$

(OR)

c. Determine the Fourier series of the wave shown in figure. 7 CO5 K3



d. Obtain Cauer-1 form of realisation of the following impedance function 8 CO4 K3

$$Z(s) = \frac{s^5 + 3s^3 + s}{s^4 + 5s^2 + 4}$$

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