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MID TERM EXAMINATIONS – April 2024

Programme	:	B.Tech.	Semester	:	Winter 2023-24
Course Title/ Course Code	:	Electric Circuits and Systems/ EEE1001	Slot	:	EEE1001
Time	:	1 ½ hours	Max. Marks	:	50

Answer all the Questions

Q.No.	Sub. Sec.	Question Description	Marks
1	(a)	Find the resistance of the circuit as shown in Figure 1(a) between A and B.	5

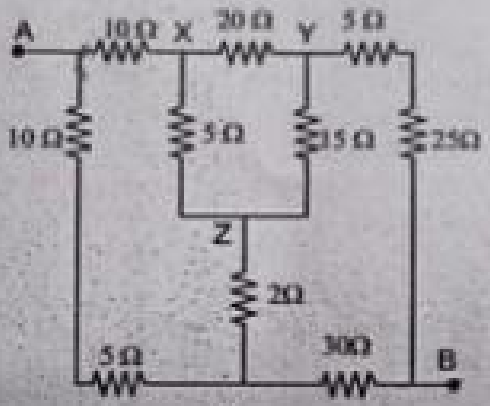

Fig.1 (a)

(b) Find the Norton equivalent circuit for the network external to the 9 ohms resistor also find the current in 9 ohms as shown in Fig.1(b). 5

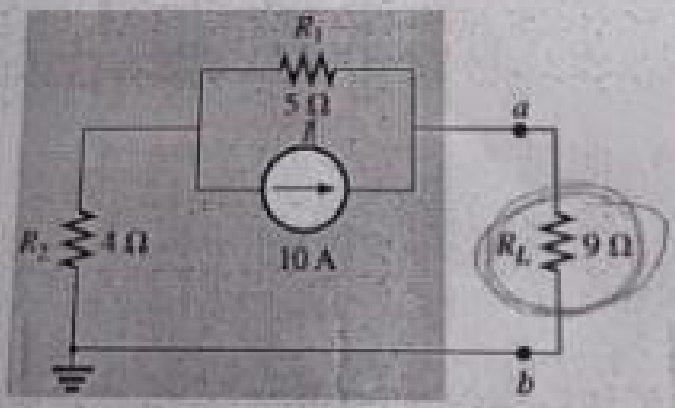

Fig.1(b)

2 Use superposition theorem to determine the value of I_o.

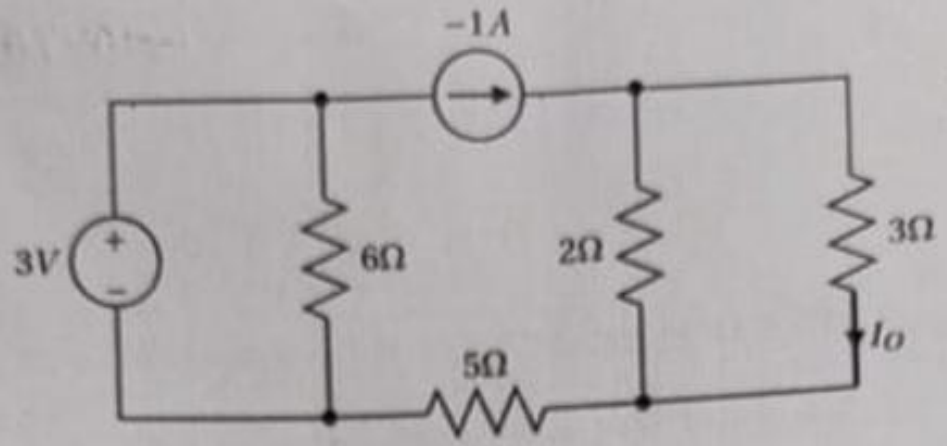

Fig.2

10

3 A series RLC circuit with L =160 mH, C = 100 μF, and R = 40.0Ω is connected to a sinusoidal voltage V (t) = 40 Sin (ωt), with ω = 200 rad/s.

(a) Compute the total impedance of the circuit?

(b) Let the current at any instant in the circuit be $I(t) = I_0 \sin(\omega t - \varphi)$. Find I_0. **10**

(c) What is the phase φ?

(d) Find the power factor using phasor diagram.

4 A current, $i(t) = 30 \sin 100\pi t$ amperes is applied across an electric circuit. Determine its average and RMS values. Calculate the form factor and peak factor of the given signal. Specify the importance of form factor and peak factor? **10**

5 Compare and deduce the analogy between electric circuits and magnetics circuits. Find the magnetic core flux of a magnetic circuit with a relative permeability of 50 has a core cross section of 5 cm^2 and mean core length of 25 cm. The coil on the core has 120 turns with an MMF of 500 AT. **10**

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