MID TERM EXAMINATIONS – April 2024

Programme	:	B.Tech.	Semester	:	Winter 2023-24
Course Title/ Course Code	:	Electric Circuits and Systems / EEE1001	Slot	:	A21+A22+A23
Time	:	1 ½ hours	Max. Marks	:	50

Answer all the Questions

Q.No.	Sub. Sec.	Question Description	Marks
1		Find the drop between terminals '**m**' and '**a**' in the network shown in Fig. 1. Also find out the power dissipation through those three 5 Ω (ohm) resistances.	10

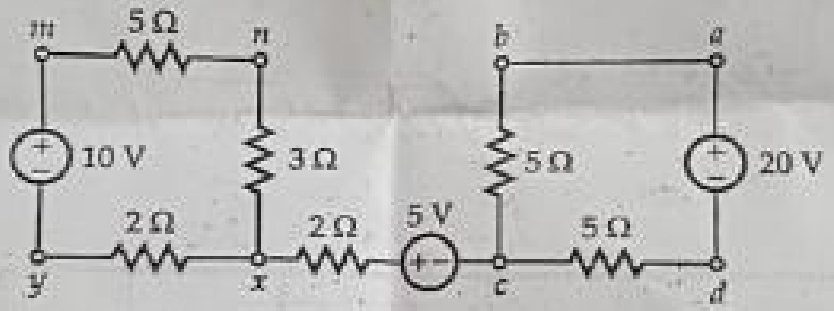

Fig.1

2 What resistance should be connected across x-y in the circuit shown in Fig.3 such that maximum power is developed across this load resistance? What is the amount of this maximum power? 10

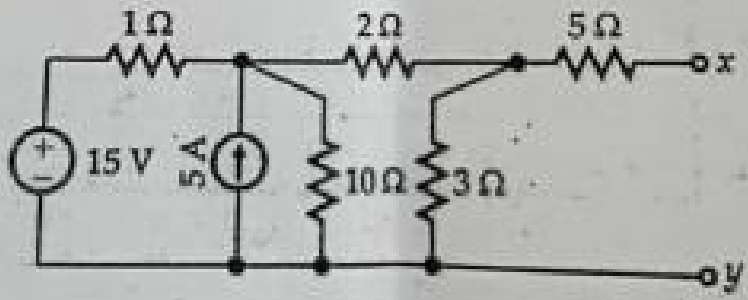

Fig.3

3 (a) An impedance of $10\angle 37°$ Ω (ohm) is in parallel with another impedance $18\angle 56.3°$ Ω (ohm) and a voltage of $250\angle 0°$ V is applied across the combination. 10

Find the source current and show the phasor diagram of the currents with respect to the applied voltage.

4 Consider a linear time inverse continuous system given by

$$\frac{d^2y(t)}{dt^2} - 9\frac{dy(t)}{dt} + 14y(t) = \frac{dx(t)}{dt} + 2x(t)$$ the input is

$x(t) = e^{-3t}\,u(t)$.

Find, (i) Natural response 10

(ii) Forced response.

(iii) Total response.

for initial condition

$$y(0^+) = 9, \frac{dy(0^+)}{dt} = 0$$

5 Find V2 in the circuit of Fig. 4 such that current in the left hand loop is zero. Assume V1 = $25\angle 0°$ V 10

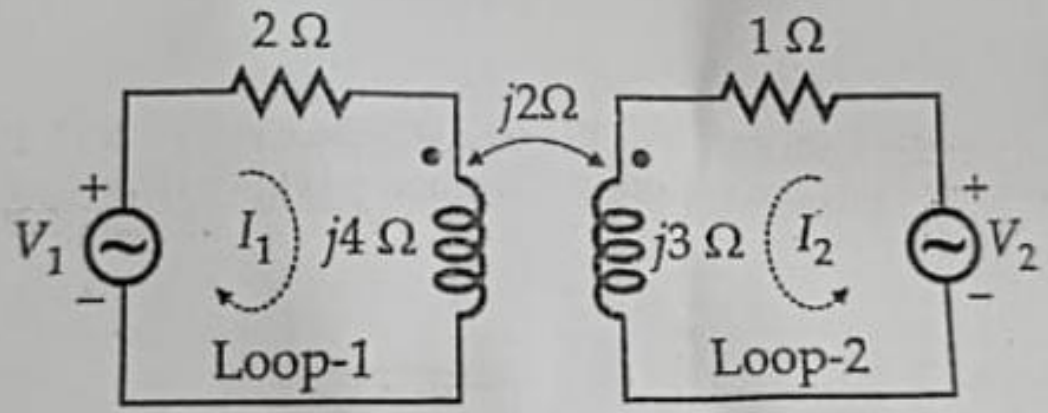

Fig.4

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