



	InSem Examination-IWinter 2023		
	Exam Seat No.:		
	Academic Year:2023-2024	Semester:III	
	Name of Programme:B.Tech	Pattern:2022	
	Name of Course:Electrical Circuits and Machines	Course Code:ETC222004	
	Max. Marks:30	Duration:1 Hr	

	<p>Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.</p> <ol style="list-style-type: none">1. This question paper contains __02__ page(s).2. Answer to each new question is to be started on a new page.3. Assume suitable data wherever required, but justify it.4. Draw the neat labelled diagrams, wherever necessary.5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question	
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Question No. 1 Attempt following Question

- a) State and prove Maximum Power Transfer Theorem and write down the equation for P_{\max} (7) CO1

OR

- b) By using superposition theorem, find the current through the 1 W resistor in Fig. 1 (7) CO1

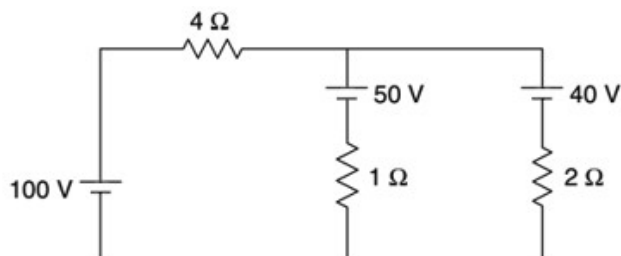
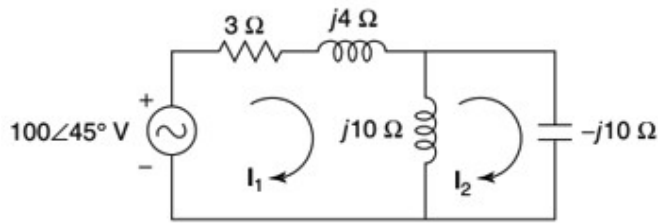


Fig. 1

- c) Find mesh currents I_1 and I_2 in the network of Fig. 2

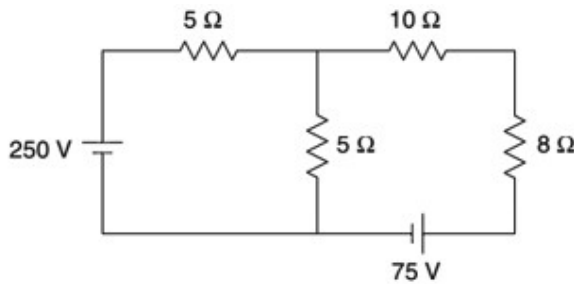


(8) CO1

Fig.2

OR

- d) Describe the steps involved in applying Thevenins theorem. Find the current through the 8 ohm resistor in Fig. 3

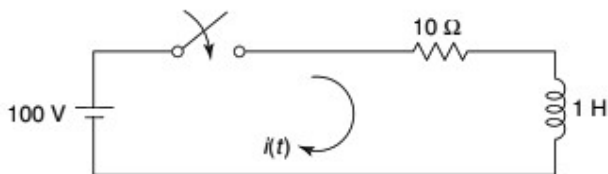


(8) CO1

Fig. 3

Question No. 2 Attempt following Question

- a) In the given network of Fig.4, the switch is closed at $t = 0$. With zero current in the inductor, find the values of i , $\frac{di}{dt}$ and $\frac{d^2i}{dt^2}$ at $t = 0^+$



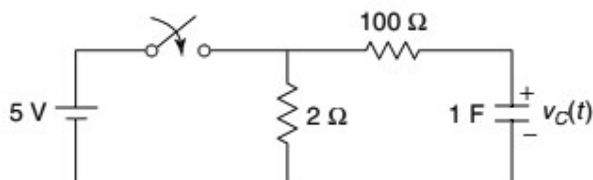
(7) CO2

Fig.4

OR

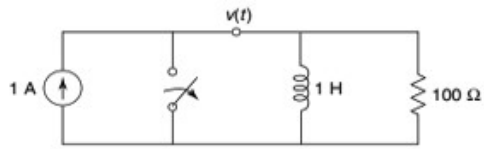
- b) In Fig.5, the switch is closed at $t = 0$ Find $V_c(t)$ for $t > 0$.

(7) CO2



c)

In the network shown in Fig.6 at $t = 0$, the switch is opened. Calculate v , $\frac{dv}{dt}$, $\frac{d^2v}{dt^2}$ at $t = 0$.



(8) CO2

Fig. 6

OR

d) What is the condition for critically damped response in case of series RLC circuit.

(8) CO2