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Question Paper Code:

EE302PC

ACE-R20

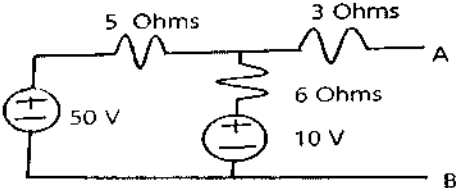
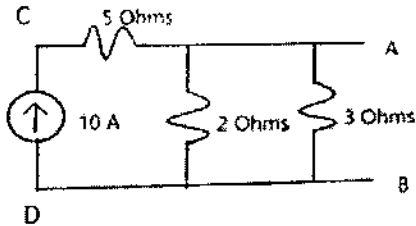
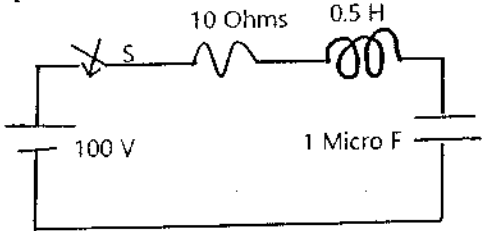
**Semester Supplementary Examination**  
**II B. Tech- I Semester- SEPTEMBER-2022**  
**ELECTRICAL CIRCUITS**  
(Electrical & Electronics Engineering)

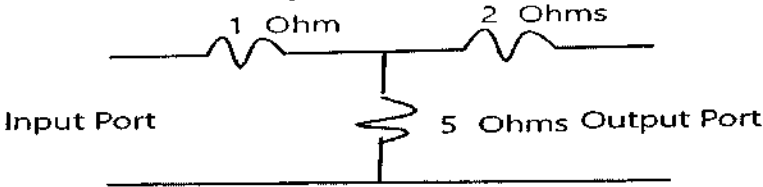
Time: 3 Hours

Max. Marks: 70

H. T. No

Answer any 5 Questions out of 8 Questions from the following

Q.No	Question	Marks
1. a)	State and explain Superposition Theorem	7
b)	Find Thevenin's equivalent circuit for the circuit shown in below figure. 	7
2. a)	State and Explain the Maximum Power Transfer Theorem.	7
b)	Verify the Reciprocity Theorem by finding the voltage across the terminals A and B of the network shown below. 	7
3. a)	What do you understand by Transient and Steady state parts of response? How can they be identified in a general solution?	7
b)	A series RLC circuit shown in following fig., Comprising $R = 10 \text{ Ohms}$ , $L = 0.5 \text{ H}$ and $C = 1 \mu\text{F}$ , is excited by a constant voltage source of $100 \text{ V}$ . Obtain the expression for the current. Assume that the circuit is relaxed initially. 	7
4. a)	Derive the relations between line and phase quantities of a balanced Three phase star connected system.	7
b)	Explain about Ideal transformer .	7

5. a)	Explain the concept of dot convention for coupled circuits. Also derive the relation between self inductances $L_1$ , $L_2$ , mutual inductance $M$ and coefficient of coupling $K$	7
b)	Obtain the Effective value, form factor and peak factor of a sinusoidal voltage $v(t) = V_m \sin \omega t$	7
6. a)	Find the laplace transform of the following functions i) $\sin^2 5t$ ii) $te^{-2t} \sin 2t$	7
b)	Explain about series and parallel resonance.	7
7. a)	A series RLC circuit is connected to a 220 V, AC supply. If a maximum current of 1 A flows through the circuit, when the frequency is 100 Hz., find the circuit constants. Given that the voltage across the capacitor, when maximum current flows is 300 V.	7
b)	For the given network function draw the pole zero diagram and hence obtain the time domain response. Verify this result analytically. $I(s) = 3s / \{(s + 1)(s + 3)\}$	7
8. a)	Find the transmission parameters for the circuit shown in following fig, 	7
b)	The Impedance parameters of a two port network are $Z_{11}=6$ ohms: $Z_{22}=4$ ohms: $Z_{12}=Z_{21}=3$ ohms compute Y parameters and write the describing equations.	7