Q.P. Code: 20EE0253 **R20**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech I Year I Semester Regular & Supplementary Examinations March-2023

PRINCIPLES OF ELECTRICAL CIRCUITS

(Electronics and Communication Engineering)

Time: 3 hours Max. Marks: 60

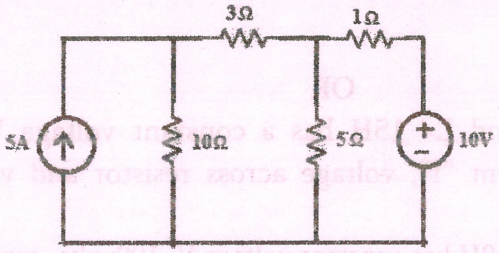
(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

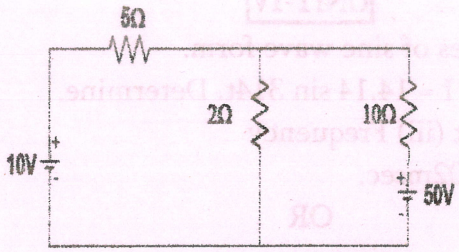
1	a	Determine the Equivalent inductance when the two inductor are connected in series and parallel.	CO1	L3	3M
	b	State and prove Kirchhoff's current law with suitable examples.	CO1	L3	3M
	c	Explain in detail about delta to star transformation of a resistive network.	CO1	L3	6M

OR

2	a	Determine the current in 10Ω resistor for the following network by using KCL.	CO1	L3	6M

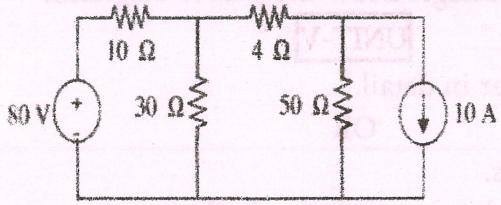


	b	Write the Mesh Current equations in the Circuit shown in figure below, and determine the currents.	CO2	L3	6M



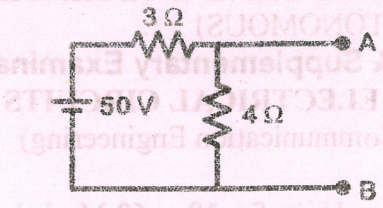
UNIT-II

3		Verify Superposition Theorem for 4Ω resistor for the following circuit.	CO3	L3	12M

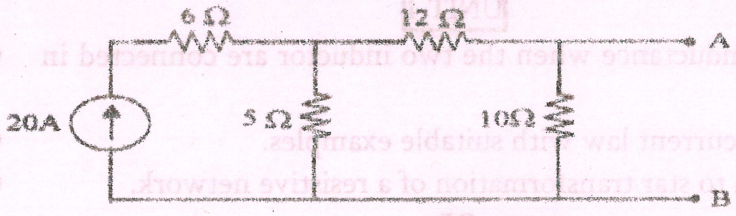


OR

4	a	State Norton's theorem.	CO3	L1	2M
	b	Find Norton's equivalent circuit across AB for the circuit shown.	CO3	L3	5M



	c	Find the Norton's equivalent for the circuit shown below.	CO3	L3	5M



UNIT-III

5	a	Define Time constant of RL circuit.	CO4	L4	6M
	b	Define Time constant of RC circuit.	CO4	L4	6M

OR

6	a	A series RL circuit with R=30Ω and L= 15H has a constant voltage V=60v applied at t=0.Determine the current "I", voltage across resistor and voltage across inductor.	CO4	L4	6M
	b	A Series RL circuit with R=50Ω and L=10H has constant voltage V=100volts applied at t=0 by the closing the switch find the complete current.	CO4	L4	6M

UNIT-IV

7	a	Derive an expression for average values of sine wave form.	CO5	L4	6M
	b	An alternating current is expressed as I = 14.14 sin 314t. Determine. (i) Maximum current (ii) RMS current (iii) Frequency (iv)Instantaneous current when t = 0.02msec.	CO5	L2	6M

OR

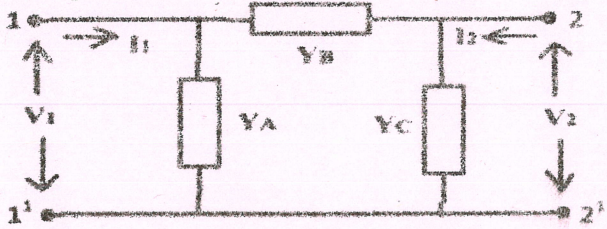
8	a	Define Admittance and impedance.	CO5	L2	4M
	b	Derive an expression for the current and impedance for a series RC circuit excited by a Sinusoidally alternating voltage. Draw the phasor diagrams.	CO5	L4	8M

UNIT-V

9		Explain about Constant-K High-pass filter in detail.	CO6	L2	12M

OR

10	a	Explain about short-circuit parameters.	CO6	L2	6M
	b	Find the Short-circuit parameters for the circuit shown in figure.	CO6	L2	6M



*** END ***