SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY :: PUTTUR
(AUTONOMOUS)

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Siddharth Nagar, Narayavanam Road, PUTTUR-517 583
QUESTION BANK

Subject with Code: BE&ME (20ME0351)	**Course & Branch: B. Tech-CE & AGE**
Year/ Sem : I-B. Tech & I-Sem	**Regulation : R20**

PART-A
UNIT I (CO1)
INTRODUCTION TO ELECTRICAL ENGINEERING

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1.	**a**	State and explain Ohm's law.	**[L1, CO1,5M]**
	b	Explain in detail about passive elements.	**[L1, CO1,5M]**
2.		Three resistances of values 20, 30 and 50 are connected in series across 20 V DC supply. Calculate, i) Equivalent resistance of the circuit. ii) Total current from the supply. iii) Voltage drop across each resistor. iv) Power dissipated in each resistor.	**[L5,CO1,10 M]**
3.		Explain about the Star-Delta and Delta-Star transformation	**[L2, CO1,10M]**
4.	**a**	State and prove Kirchhoff's laws with suitable examples.	**[L2,CO1,5M]**
	b	Find i_1, i_2, i_3 for the given circuit by using Kirchhoff's laws?	**[L4, CO1, 5M]**
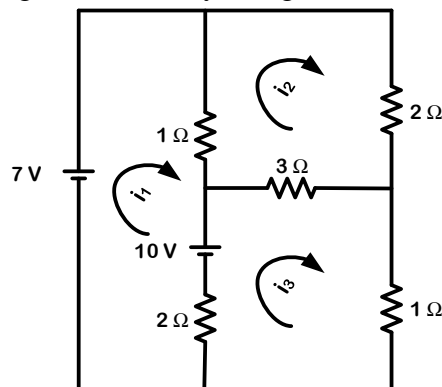
5.		Find the current through 12Ω resistor for the given circuit using Kirchoff's laws.	**[L3, CO1,8M]**
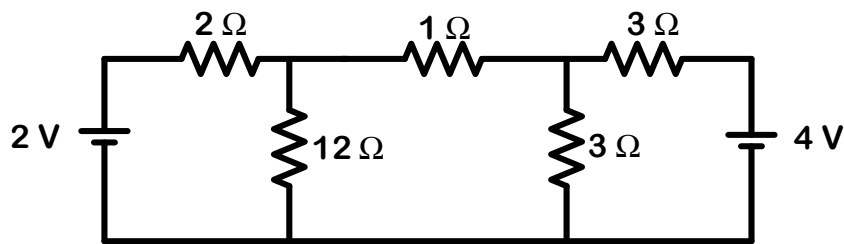
6.   Find the current delivered by the source for the circuit shown in figure.   **[L3,CO1,10 M]**
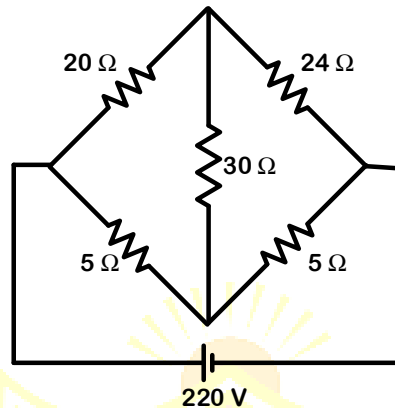

7.   Find the voltage to be applied across AB in order to drive a current of 5A into the circuit.   **[L5,CO1,10 M]**
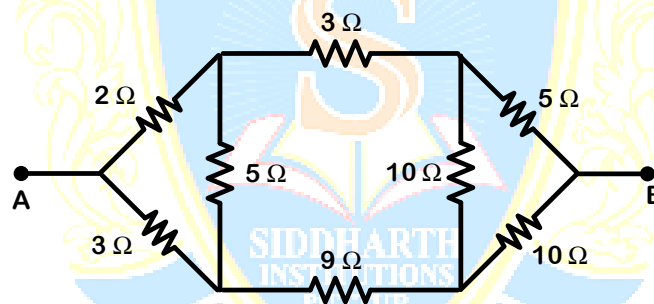
8.   Explain in detail about star to delta transformation of given resistive network.   **[L2, CO1,10M]**

9.   Explain the following in detail   **[L1, CO1,10M]**
        i) Resistive networks
        ii) Inductive networks
        iii) Capacitive networks

10.   Explain in detail about   **[L2, CO1,10M]**
        (i) RMS value, (ii) Average value, (iii) Form factor, (iv) Peak factor
        (v) Prove that the form factor of the sinusoidal wave is 1.11.

UNIT II (CO2)
NETWORK THEOREMS &TWO PORT NETWORKS

1. **a)** State Super position theorem   **[L1,CO2,2M]**

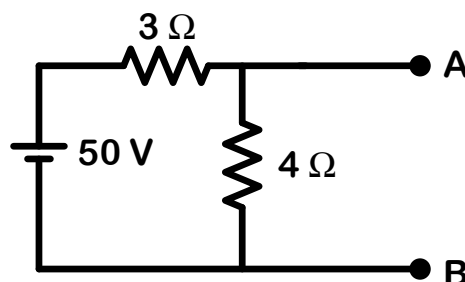   **b)** Calculate the current in 2Ω resistor in the given circuit using super position theorem.   **[L3,CO2,8M]**
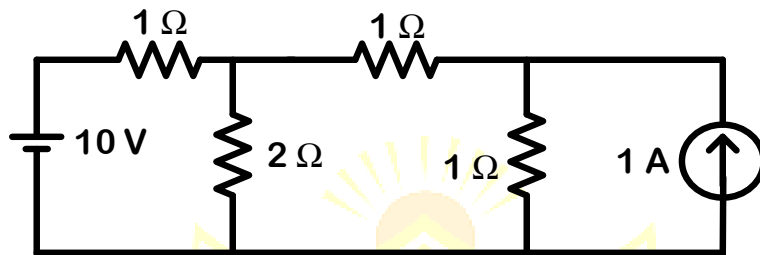
2. **a)** State Thevenin's theorem   **[L1,CO2,2M]**

    b) Find the Thevenin's equivalent circuit across AB for the circuit shown.   **[L3,CO2,8M]**
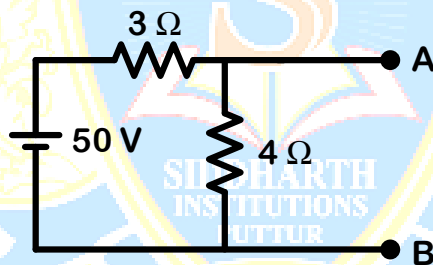
**3.** **a)** State Norton's theorem.   **[L1,CO2,2M]**

    b) Find Norton's equivalent circuit across AB for the circuit shown. **[L3,CO2,8M]**


4. Determine the maximum power delivered to the load resistance R_L **[L3,CO2,10M]**
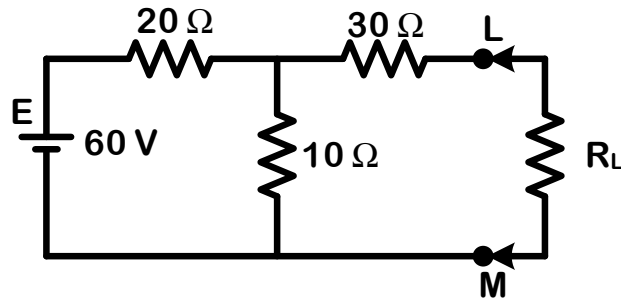
5		State and prove Reciprocity theorem with suitable example.	**[L3][CO2][10M]**
6.	**a)**	Explain in detail about Impedance parameters	**[L2][CO2][5M]**
	b)	Briefly discuss about Admittance parameters	**[L2][CO2][5M]**
7.		Find the Open circuit parameters for the given circuit	**[L4][CO2][10M]**
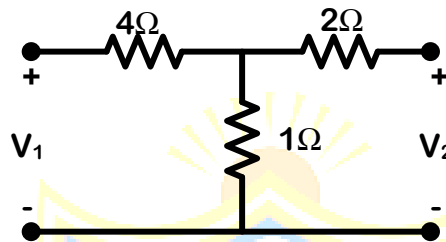
8.		Find the Short circuit parameters for the given circuit.	**[L4][CO2][10M]**
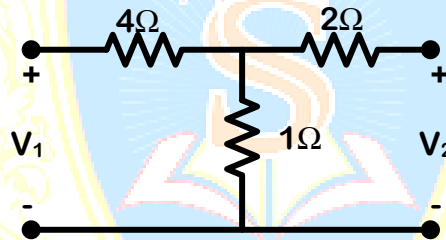
9.	**a)**	The given ABCD parameters are A=2, B=0.9, C=1.2, D=0.5. Find Y- parameters.	**[L3][CO2][5M]**
	b)	The given Y-parameters are Y_{11}=0.5, Y_{12}=Y_{21}=0.6, Y_{22}=0.9. Find the Impedance parameters.	**[L3][CO2][5M]**
10.	**a)**	Define Thevenin's and Norton's theorem	**[L1][CO2][2M]**
	b)	State Maximum power theorem	**[L1][CO2][2M]**
	c)	State Reciprocity theorem	**[L1][CO2][2M]**
	d)	Define Super position theorem	**[L1][CO2][2M]**
	e)	Mention the importance of two port networks	**[L1][CO2][2M]**
			[L1][CO2][2M]

UNIT III (CO3)

DC MOTORS & TRANSFORMERS

1. **a)** Discuss about the principle of operation of DC motors   **[L5,CO3,5M]**

     b) Calculate the value of torque established by the armature of a 4-pole DC motor having 774 conductors, 2 paths in parallel, 24mwb flux per pole when the total armature current is 50A.   **[L5,CO3,5M]**

2. A 220V shunt motor takes a total current of 80A and runs at 800 r.p.m. Shunt field resistance and armature resistance are 50Ω and 0.1Ω, respectively. If iron and friction losses amount to 1600W. Find (i) Copper losses (ii) Armature torque (iii) Shaft torque (iv) Efficiency.   **[L5,CO3,10M]**

3. **a)** Derive Torque equation of dc motor.   **[L3, CO3,5M]**

     b) The counter emf of Shunt motor is 227 V. The field resistance is 160Ω and field current 1.5A. If the line current is 36.5A, find the armature resistance also find armature current when the motor is stationary.   **[L5, CO3,5M]**

4. **a)** Explain about constructional details of dc motor.   **[L2, CO3,5M]**

     b) A 6 pole lap wound shunt motor has 500 conductors, the armature and shunt field resistances are 0.05 Ω and 25 Ω, respectively. Find the speed of the motor if it takes 120 A from dc supply of 100 V. Flux per pole is 20 mWb.   **[L5, CO3,5M]**

5 Briefly discuss about various types of DC motors with neat sketches.   **[L1,CO3,10M]**

6. **a)** Derive EMF equation of a transformer   **[L3, CO3,6M]**

     b) A 100 kVA, 11000/400 V, 50 Hz transformer has 40 secondary turns. Calculate the number of primary turns and primary and secondary currents.   **[L4, CO3,4M]**

7. **a)** Explain constructional details of transformer.   **[L2, CO3,6M]**

     b) A 20 kVA, 2000/200 V, 50 Hz transformer has 66 secondary turns. Calculate the number of primary turns and primary and secondary currents. Neglect losses.   **[L4, CO3,4M]**

8. Explain in detail about various transformer losses.   **[L2,CO3,10M]**

9. **a)** Derive the condition for maximum efficiency of the transformer.   **[L3, CO3,5M]**

     b) Discuss about the voltage regulation of the transformer.   **[L3, CO3,5M]**

10.	a)	Enumerate the types of DC motors.	[L1, CO3, 2M]
	b)	List the application of DC motors.	[L1, CO3, 2M]
	c)	Write the expression for transformer ration in terms voltage, current and turns	[L5, CO3, 2M]
	d)	What is working principle of transformer?	[L1, CO3, 2M]
	e)	Enumerate the various losses associated with transformer.	[L1, CO3, 2M]

PART B

UNIT IV (CO4)

1		What is casting? Briefly explain the casting process with neat sketch and write the advantages and applications.	L2	CO4	10M
2		Describe the permanent mold casting with neat sketch and list the advantages, limitations and applications.	L2	CO4	10M
3		Sketch and explain the Centrifugal casting with advantages, limitations and applications	L2	CO4	10M
4		Classify the welding types? Explain the working of arc welding with neat sketch and mention the advantages, limitations and applications.	L2	CO4	10M
5		Describe the principle of soldering? Explain the soldering process with neat sketch and list the advantages, limitations and applications.	L2	CO4	10M
6		Illustrate the process of investment casting with neat sketches? Mention the advantages, limitations and applications.	L4	CO4	10M
7		Illustrate the various positions in welding with neat sketches.	L2	CO4	10M
8		What is mean by welding? Explain the working of gas welding with neat sketch and mention the advantages, limitations and applications.	L2	CO4	10M
9		Explain below with neat sketches (a)Brazing (b) Adhesive bonding	L2	CO4	10M
10		Define metal joining process? Classify the various metal joining processes with advantages and limitations.	L1	CO4	10M

UNIT V (CO5)

1		Define the working principle of lathe? Draw a line diagram of the lathe and describe functions of main parts with advantages and limitations.	L2	CO5	10M
2		What is a shaper? Draw the block diagram of a shaper machine with principal parts, specifications, advantages and applications.	L2	CO5	10M
3		Illustrate the working principle of slotting machine in detail with neat sketch.	L2	CO5	10M
4		Describe the working principle of boring machine of neat sketch.	L1	CO5	10M
5		Discuss the working procedure of milling machine with neat sketch.	L2	CO5	10M
6		What is CNC? Explain the working of CNC machine with block diagram.	L2	CO5	10M
7		Differentiate Shaper, Slotter and Planner machine.	L4	CO5	10M

8		What is planer? Explain its working principle with neat diagram.	**L2**	**CO5**	**10M**
9		Explain below a) Classify the CNC machine b) Part programming	**L2**	**CO5**	**10M**
10		Illustrate the working principle of drilling machine with principle parts with neat diagram.	**L2**	**CO5**	**10M**

UNIT VI (CO6)

1		What is Automobile? Draw the layout of automobile and discuss the functions of the automobile basic components.	**L2**	**CO6**	**10M**
2		What is the need of automobile? Explain the four wheel automobile components with neat sketch.	**L2**	**CO6**	**10M**
3		Explain below with neat sketches a) rear wheel drive b) front wheel drive	**L2**	**CO6**	**10M**
4		Classify the automobiles in detail.	**L2**	**CO6**	**10M**
5		Differentiate between rear wheel drive and front wheel drive.	**L4**	**CO6**	**10M**
6		What is meant by vapour compression refrigeration system? Explain its working with neat diagram	**L2**	**CO6**	**10M**
7		What is meant by vapour absorption system? Explain its working with neat sketch.	**L2**	**CO6**	**10M**
8		Define air conditioning? Classify various air conditioning systems in detail.	**L2**	**CO6**	**10M**
9		What is refrigeration system? Write the differences between vapour compression refrigeration and vapour absorption systems.	**L4**	**CO6**	**10M**
10	(a)	Mention the applications of refrigeration system.			
	(b)	Write about air conditioning system.			

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