



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

**QUESTION BANK(DESCRIPTIVE)**

**Subject with Code: BE&ME (20ME0351)**  
**Year/ Sem : I-B. Tech & I-Sem**

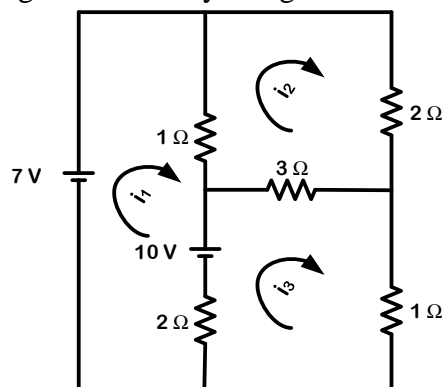
**Course & Branch: B. Tech-CE & AGE**  
**Regulation : R20**

**PART-A**

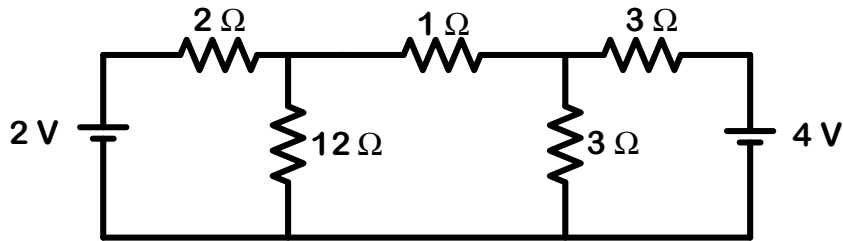
**UNIT I (CO1)**

**INTRODUCTION TO ELECTRICAL ENGINEERING**

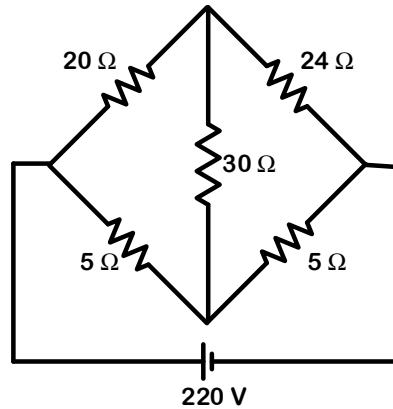
1. a State and explain Ohm's law. [L1, CO1,5M]  
b Explain in detail about passive elements. [L1, CO1,5M]
2. Three resistances of values 20, 30 and 50 are connected in series across 20 V DC supply. Calculate, [L5,CO1,10M]
  - i) Equivalent resistance of the circuit.
  - ii) Total current from the supply.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



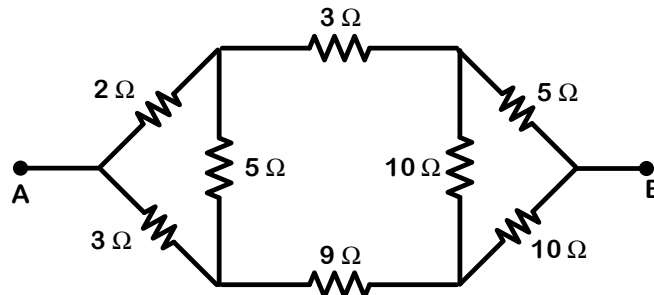
5. Find the current through 12Ω resistor for the given circuit using Kirchoff's laws. [L3, CO1,8M]



6. Find the current delivered by the source for the circuit shown in figure. [L3,CO1,10M]



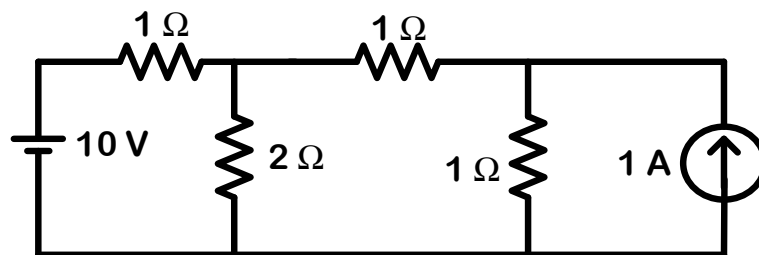
7. Find the voltage to be applied across AB in order to drive a current of 5A into the circuit. [L5,CO1,10M]



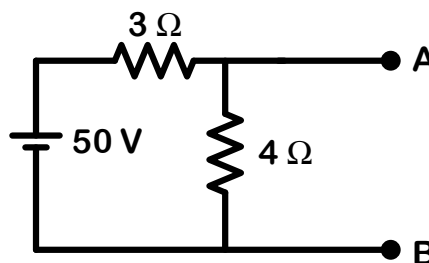
8. Explain in detail about star to delta transformation of given resistive network. [L2, CO1,10M]
9. Explain the following in detail [L1, CO1,10M]  
 i) Resistive networks  
 ii) Inductive networks  
 iii) Capacitive networks
10. Explain in detail about [L2, CO1,10M]  
 (i) RMS value, (ii) Average value, (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**

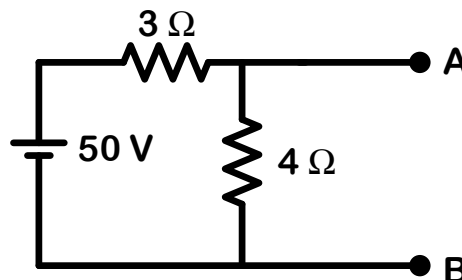
1. a) State Super position theorem [L1,CO2,2M]  
 b) Calculate the current in  $2\Omega$  resistor in the given circuit using super position theorem. [[L3],CO2,8M]



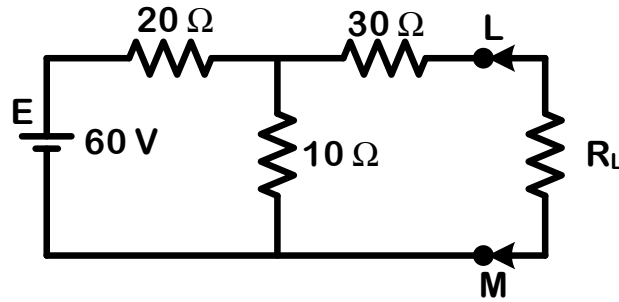
2. a) State Thevenin's theorem [L1,CO2,2M]  
 b) Find the Thevenin's equivalent circuit across AB for the circuit shown. [L3],CO2,8M]



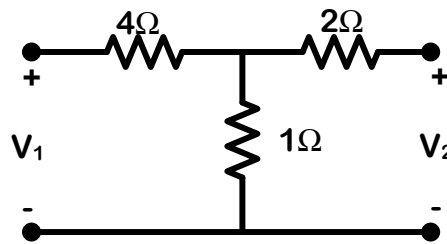
3. a) State Norton's theorem. [L1,CO2,2M]  
 b) Find Norton's equivalent circuit across AB for the circuit shown. [L3,CO2,8M]



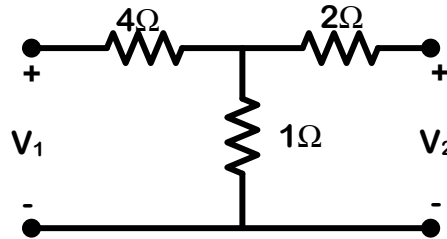
4. Determine the maximum power delivered to the load resistance  $R_L$  [L3,CO2,10M]



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]

**UNIT III (CO3)****DC MOTORS & TRANSFORMERS**

- |           |  |   |
|-----------|--|---|
| <b>1.</b> | <p><b>a)</b> Discuss about the principle of operation of DC motors</p> <p><b>b)</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.</p>   | <p><b>[L5, CO3,5M]</b></p> <p><b>[L5,CO3,5M]</b></p>          |
| <b>2.</b> | <p>A 220V shunt motor takes a total current of 80A and runs at 800 r.p.m. Shunt field resistance and armature resistance are <math>50\Omega</math> and <math>0.1\Omega</math>, respectively. If iron and friction losses amount to 1600W. Find (i) Copper losses (ii) Armature torque (iii) Shaft torque (iv) Efficiency.</p>                        | <b>[L5,CO3,10M]</b>   |
| <b>3.</b> | <p><b>a)</b> Derive Torque equation of dc motor.</p> <p><b>b)</b> The counter emf of Shunt motor is 227 V. The field resistance is <math>160\Omega</math> 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.</p>  | <p><b>[L3,CO3,5M]</b></p> <p><b>[L5, [CO3],5M]</b></p>        |
| <b>4.</b> | <p><b>a)</b> Explain about constructional details of dc motor.</p> <p><b>b)</b> A 6 pole lap wound shunt motor has 500 conductors, the armature and shunt field resistances are <math>0.05\Omega</math> and <math>25\Omega</math>, respectively. Find the speed of the motor if it takes 120 A from dc supply of 100 V. Flux per pole is 20 mWb.</p> | <p><b>[L2], [CO3],5M]</b></p> <p><b>[L5, [CO3],5M]</b></p>    |
| <b>5</b>  | <p>Briefly discuss about various types of DC motors with neat sketches.</p>  | <b>[L1,CO3,10M]</b>   |
| <b>6.</b> | <p><b>a)</b> Derive EMF equation of a transformer</p> <p><b>b)</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.</p>   | <p><b>[L3], [CO3],[6M]</b></p> <p><b>[L4], [CO3],[4M]</b></p> |
| <b>7.</b> | <p><b>a)</b> Explain constructional details of transformer.</p> <p><b>b)</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.</p>   | <p><b>[L2], [CO3],6M]</b></p> <p><b>[L4], [CO3],4M]</b></p>   |
| <b>8.</b> | <p>Explain in detail about various transformer losses.</p>   | <b>[L2],[CO3],[10M]</b>                                       |
| <b>9.</b> | <p><b>a)</b> Derive the condition for maximum efficiency of the</p>  | <b>[L3], [CO3],5M]</b>  |

- transformer.
- 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?
  - e) Enumerate the various losses associated with transformer. [L1, CO3, 2M]
- [L1, CO3, 2M]

**PART B**  
**UNIT IV (CO4)**

1	What is casting? Briefly elaborate 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.	[L3][CO4]	[10M]
4	Illustrate the process of investment casting with neat sketches? 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	Explain below with neat sketches (a) Brazing (b) Adhesive bonding	[L2][CO4]	[10M]
7	Outline the various positions in welding with neat sketches.	[L2][CO4]	[10M]
8	Classify the welding types? Explain the working of arc welding with neat sketch and mention the advantages, limitations and applications.	[L2][CO4]	[10M]
9	What is meant by welding? Elaborate the working of gas welding with neat sketch and mention the advantages, limitations and applications.	[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.	[L3][CO5]	[10M]
2	What is a shaper? Draw the block diagram of a shaper machine with principal parts, specifications, advantages and applications.	[L3][CO5]	[10M]
3	Illustrate the working principle of slotting machine in detail with neat sketch.	[L2][CO5]	[10M]

4		What is planer? Explain its working principle with a neat diagram.	[L2][CO5]	[10M]
5		Illustrate the working principle of drilling machine with principle parts with neat diagram.	[L3][CO5]	[10M]
6		Describe the working principle of boring machine with a neat sketch.	[L2][CO5]	[10M]
7		Elaborate the working principle of milling machine with neat sketch.	[L2][CO5]	[10M]
8		Differentiate Shaper, Slotter and Planner machines..	[L4][CO5]	[10M]
9		What is CNC? Explain the working of CNC machine with block diagram.	[L2][CO5]	[10M]
10		Explain below a) Classify the CNC machine b) CNC programming	[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	(a)	Describe Front wheel, Rear wheel drive with neat sketches.	[L2][CO6]	[5M]
	(b)	Compare front wheel drive and Rear wheel drive system.	[L4][CO6]	[5M]
4		Classify the automobiles in detail.	[L4][CO6]	[10M]
5		Elaborate transmission system components of automobile.	[L2][CO6]	[10M]
6	(a)	What is refrigeration system? Draw a neat diagram of refrigeration system.	[L3][CO6]	[5M]
	(b)	Distinguish between vapour compression refrigeration and vapour absorption systems.	[L4][CO6]	[5M]
7		How do you classify refrigeration systems? Explain the working of vapour compression refrigeration system with a neat diagram.	[L2][CO6]	[10M]
8		With a neat sketch describe the working principle of vapour absorption system.	[L2][CO6]	[10M]
9		Define air conditioning? Classify various air conditioning systems in detail.	[L2][CO6]	[10M]
10	(a)	Mention the applications of refrigeration system.	[L1][CO6]	[5M]
	(b)	List out the various factors involved in the installation of an air conditioning system.	[L1][CO6]	[5M]

***PREPARED BY Dr. P. RAMESH & Dr. RAHUL BHATTACHARJEE***