



SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR

Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code : Basic Electrical and Mechanical Engineering (19ME0345)

Course & Branch : B. Tech - CIVIL

Year & Semester : II - B. Tech. & I - Semester

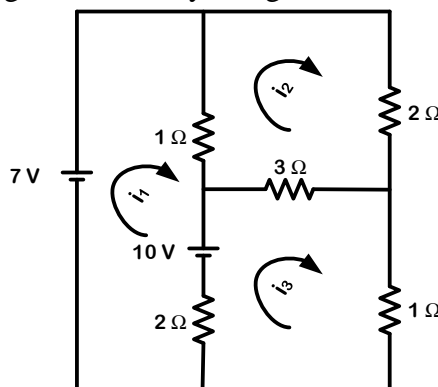
Regulation : R19

PART-A

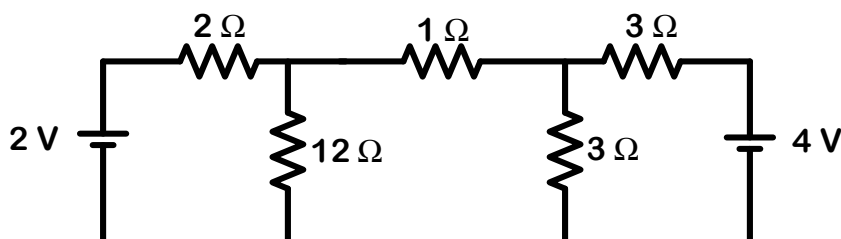
UNIT-I

INTRODUCTION TO ELECTRICAL ENGINEERING

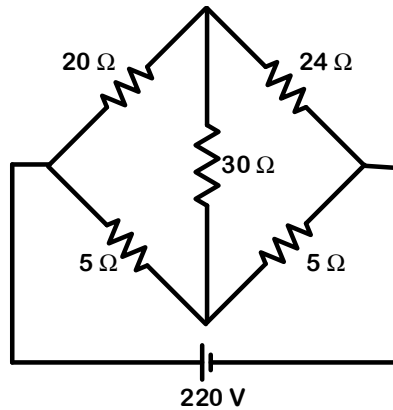
1. a) State and explain Ohm's law. [L1, CO1,5M]
 b) Explain in detail about passive elements. [L1, CO1,5M]
2. Three resistances of values 20, 30 and 50 are connected in series across 20 V DC supply. Calculate, [L5, CO1,10M]
 - i) Equivalent resistance of the circuit.
 - ii) Total current from the supply.
 - 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]



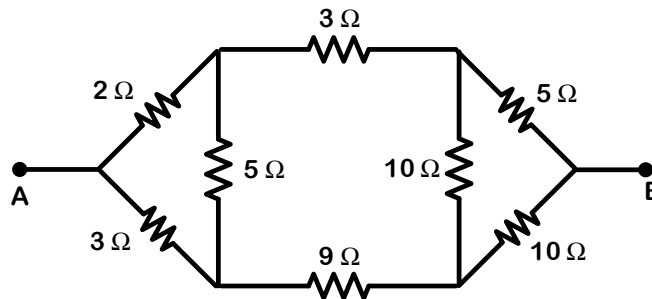
5. Find the current through 12Ω resistor for the given circuit using Kirchoff's laws. [L3, CO1,8M]



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



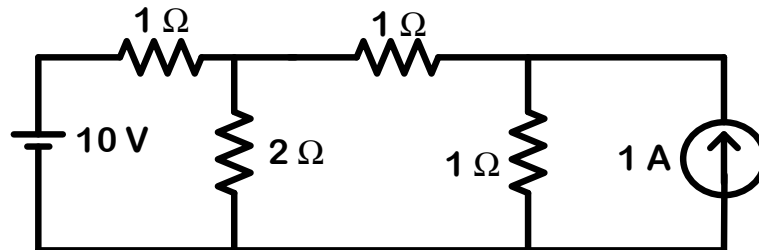
7. Find the voltage to be applied across AB in order to drive a current of 5A into the circuit. [L5,CO1,10M]



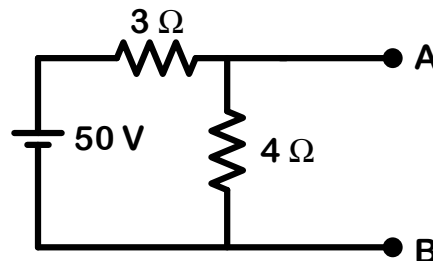
8. Explain in detail about star to delta transformation of given resistive network. [L2, CO1,10M]
9. Explain the following in detail [L1, CO1,10M]
- i) Resistive networks
 - ii) Inductive networks
 - iii) Capacitive networks
10. Explain in detail about [L2, CO1,10M]
- (i) RMS value, (ii) Average value, (iii) Form factor, (iv) Peak factor
 - (v) Prove that the form factor of the sinusoidal wave is 1.11.

UNIT - II
NETWORK THEOREMS & TWO PORT NETWORKS

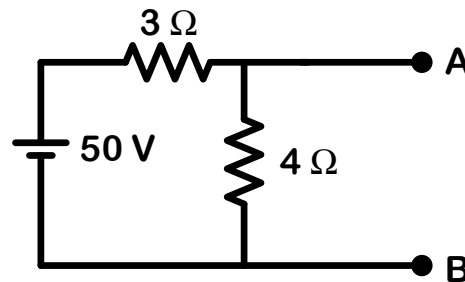
1. a) State Super position theorem [L1,CO2,2M]
b) Calculate the current in 2Ω resistor in the given circuit using super position theorem. [L3,CO2,8M]



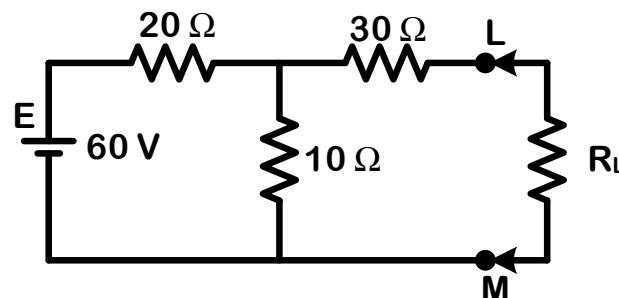
2. a) State Thevenin's theorem [L1,CO2,2M]
b) Find the Thevenin's equivalent circuit across AB for the circuit shown. [L3,CO2,8M]



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]



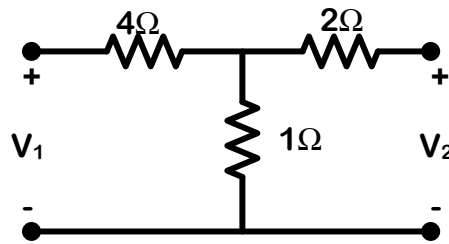
5. State and prove Reciprocity theorem with suitable example. [L3][CO2][10M]
6. a) Explain in detail about Impedance parameters [L2][CO2][5M]

b) Briefly discuss about Admittance parameters

[L2][CO2][5M]

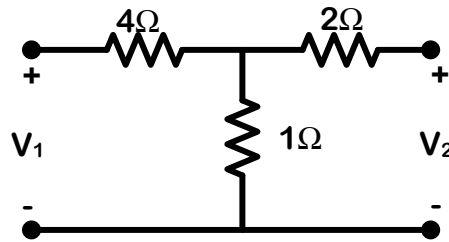
7. Find the Open circuit parameters for the given circuit

[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]

UNIT – III**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 0.05Ω and 25Ω , 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]

Prepared by: **B.RAMESH**


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UNIT IV (CO4)

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|----|---|------------|
| 1 | (a) What is manufacturing process? Classify the various manufacturing process. | L2 PO1 5M |
| | (b) Explain the importance of manufacturing process towards technology and social-economic development? | L1 PO1 5M |
| 2 | What is casting? Describe the defects in casting and prevents. | L2 PO2 10M |
| 3 | (a) List the various advantages and applications of casting? | L2 PO2 5M |
| | (b) What is pattern? Explain various pattern materials are used to making pattern. | L2 PO2 5M |
| 4 | (a) Sketch and explain different types of patterns are used in foundry. | L2 PO2 5M |
| | (b) What are the different pattern allowances? Explain with neat sketch. | L2 PO2 5M |
| 5 | Draw a sketch of Gating system and explain the functions of various elements? Explain the types of gating systems with neat diagram. | L4 PO3 10M |
| 6 | What is casting? Explain any two types of casting process with neat sketch and mention the advantages and limitations. | L2 PO2 10M |
| 7 | What is mean by welding? Explain the working of gas welding with neat sketch and mention the advantages, limitations and applications. | L2 PO2 10M |
| 8 | (a) Explain below with neat sketches
(a) Soldering (b) Brazing (d) Adhesive bonding | L3 PO3 10M |
| 9 | (a) What is core? How do you classify the cores? | L1 PO1 5M |
| | (b) Explain the molding steps with neat sketch? | L3 PO3 5M |
| 10 | Classify the welding types? Explain the working of arc welding with neat sketch and mention the advantages, limitations and applications. | L3 PO3 10M |

UNIT V (CO5)

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|----|--|----|-----|-----|
| 1 | What is machine tool? Explain Working and Auxiliary motions in machine tools. | L2 | PO2 | 10M |
| 2 | Define the working principle of lathe? Draw the layout of lathe and write the specification lathe. | L2 | PO2 | 10M |
| 3 | Explain below
(a) Kinematics of machine tool (b) Motion transmission (c) Automatic lathe | L3 | PO3 | 10M |
| 4 | (a) Name the different types of the lathes? | L1 | PO1 | 5M |
| | (b) Write the different types of lathe operations? | L1 | PO1 | 5M |
| 5 | (a) Explain the accessories of lathe machine. | L1 | PO1 | 5M |
| | (b) What are the differences between a Turret and a Capstan lathe? | L4 | PO3 | 5M |
| 6 | What is a shaper? Draw the block diagram of a shaper machine with principal parts and specifications. | L1 | PO1 | 10M |
| 7 | Explain the slotting and planning machine with block diagram with specifications. | L4 | PO3 | 10M |
| 8 | (a) What is the working principle and principle parts of a drilling and horizontal or vertical boring machine? | L2 | PO2 | 5M |
| | (b) Explain the principle features of milling machine? | L1 | PO1 | 5M |
| 9 | (a) Define indexing? Explain any two indexing methods with suitable example. | L2 | PO2 | 5M |
| | (b) What is the working principle and principle parts of a grinding machine? What are the grinding wheel parameters that influence the grinding performance? | L1 | PO2 | 5M |
| 10 | (a) What is planer? Explain any one type of planer mechanism. | L3 | PO3 | 5M |
| | (b) Explain about
(a) CNC machine (b) Programming | L1 | PO2 | 5M |

UNIT VI (CO6)

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|---|--|----|-----|-----|
| 1 | What is Automobile? Draw the layout of automobile and discuss the functions of the automobile basic components. | L2 | PO2 | 10M |
| 2 | Explain the chassis construction with the help of suitable diagrams. Make a list of various components mounted on the chassis. | L2 | PO2 | 10M |
| 3 | Explain below with neat sketches
a) rear wheel drive b) front wheel drive | L2 | PO2 | 10M |
| 4 | What is the role of engine in automobile? Write the classification of automobile engines? | L2 | PO2 | 10M |

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|----|---|----|-----|-----|
| 5 | Role of systems in automobile? List the various systems in automobile? | L1 | PO1 | 10M |
| 6 | What is meant by Vapour compression Refrigeration System? Explain its working with neat diagram | L2 | PO2 | 10M |
| 7 | Explain about
(a) Heat Pump (b) COP (c) Energy Efficiency Rating | L2 | PO2 | 10M |
| 8 | Examine the working of House Hold Refrigerator with line diagram. | L2 | PO2 | 10M |
| 9 | Define Psychometry and Explain their Properties. | L4 | PO3 | 10M |
| 10 | Discuss the psychometric process. | L2 | PO2 | 10M |

Prepared by A R INBARAJ