SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
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QUESTION BANK (DESCRIPTIVE)

Subject with Code : PEE(**20EE0250**)

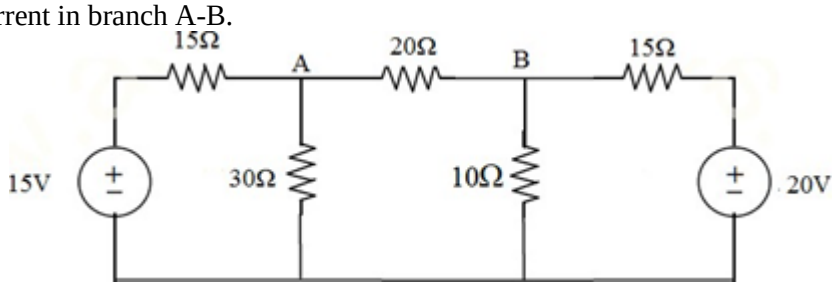
Course & Branch: B.Tech – CSE,CSE(IoT),CSE(AI&ML),CSIT

Year & Sem **:** I-B.Tech & I-Sem **Regulation:** R20

UNIT – I

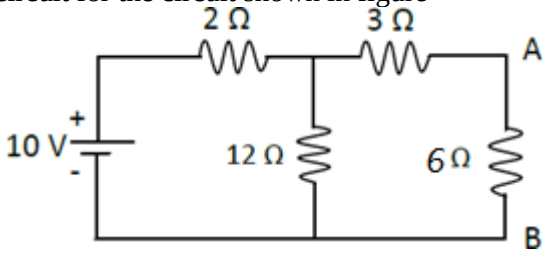
1. (a) State and explain Kirchhoff's laws? [L1,CO1][5M]

(b)Determine the current in branch A-B. [L3,CO1][5M]

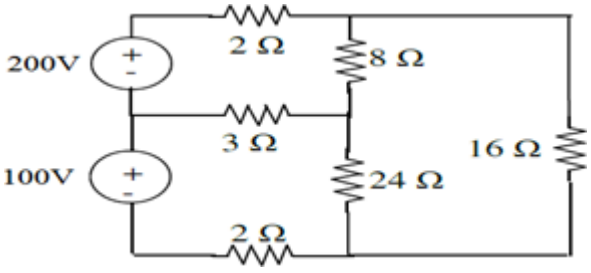


2.(a) State and explain Thevenin's theorem. [L1,CO2][5M]

(b) Draw the Nortons equivalent circuit for the circuit shown in figure [L3,CO2][5M]

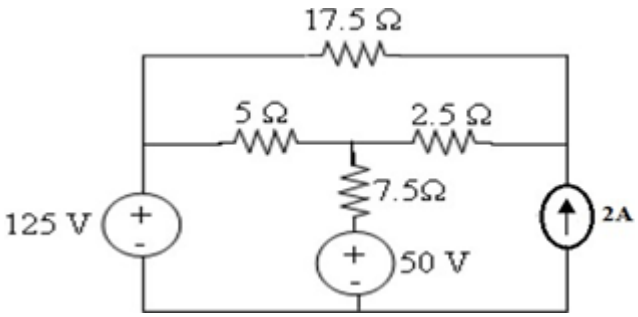


3.(a) Determine the mesh currents for the circuit shown below. [L3,CO1][5M]



(b) State and explain superposition theorem with suitable example [L1,CO2][5M]

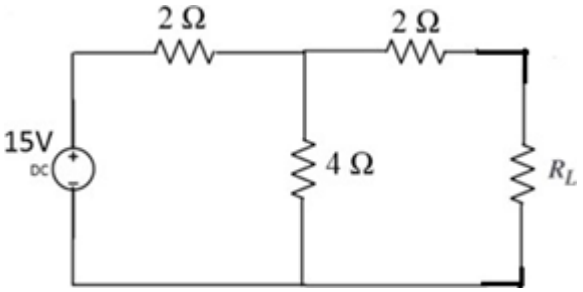
4. (a) Determine node voltage for the circuit shown using KCL and Ohms law [L2,CO1][5M]



(b). Explain Ideal and Practical Voltage and Current Sources with neat graphs [L1,CO1][5M]

5.(a) State and prove Maximum Power Transfer Theorem [L2,CO2][5M]

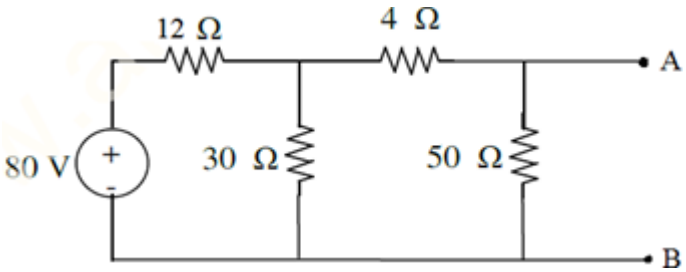
(b) Find load current in the circuit shown for load resistance of 3 ohm. [L3,CO2][5M]



6.(a) Derive the expression for equivalent resistance when two resistors R1 and R2 are connected in

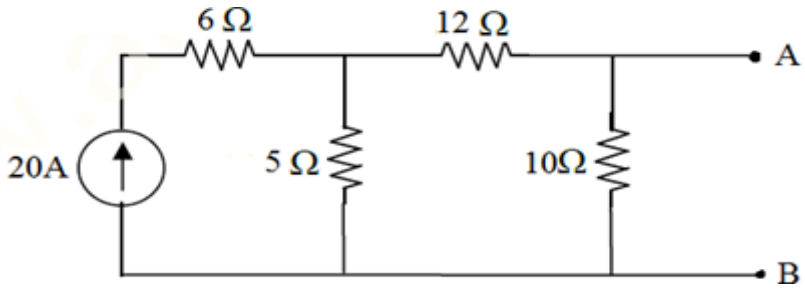
(i) Series configuration (ii) Parallel configuration [L1,CO1][5M]

(b) Find the Thevenins equivalent circuit for the circuit shown below. [L3,CO2][5M]



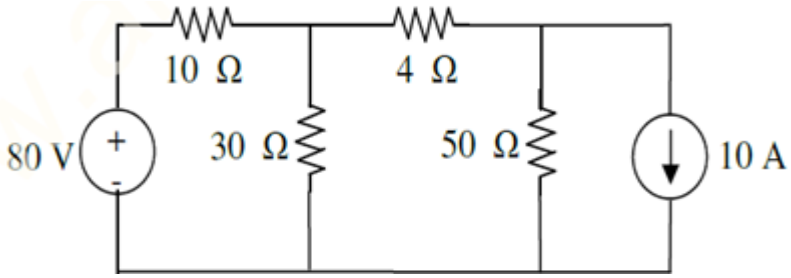
7.(a) Mention Voltage –Current relations and Power in elements R,L and C. [L1,CO1][5M]

(b) Find the Norton's equivalent for the circuit shown below. [L3,CO2][5M]



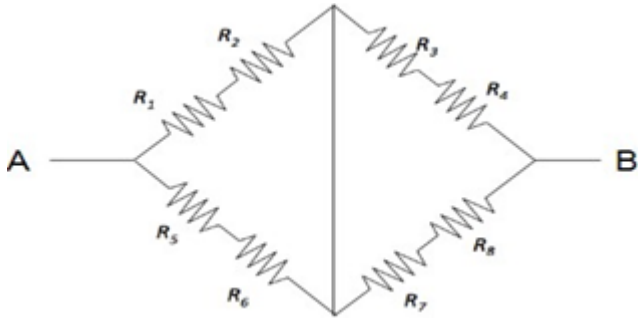
8.(a) State and Explain Norton's Theorem with suitable example. [L2,CO2][5M]

(b) Using Superposition theorem, determine current flowing through 4 ohm resistor[L2,CO2][5M]



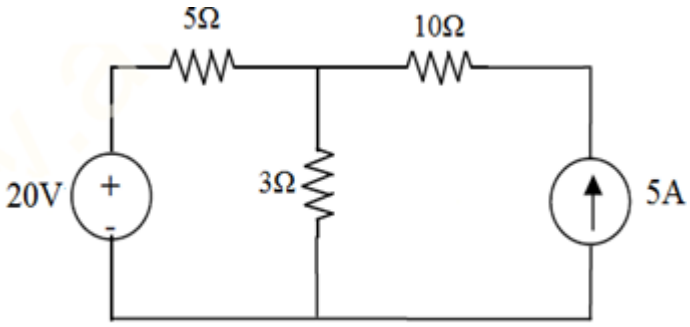
9.(a) Explain Ohms Law, Dependent and Independent sources briefly. [L1,CO1][5M]

(b) Determine equivalent resistance between AB for the circuit shown below. [L2,CO1][5M]



10.(a) Explain function of circuit elements R, L and C [L1,CO1][5M]

(b) Find current flowing through 3 Ohm resistor using superposition theorem [L2,CO2][5M]



UNIT –II
AC CIRCUITS

1.(a) Derive an expression for RMS Value of sine wave form [L2,CO3][5M]

(b) An alternating current is expressed as i=14.14 sin3145. Determine the following
(i) maximum current (ii) RMS current
(iii) frequency (iv) instantaneous current at 0.02msec [L3,CO3][5M]

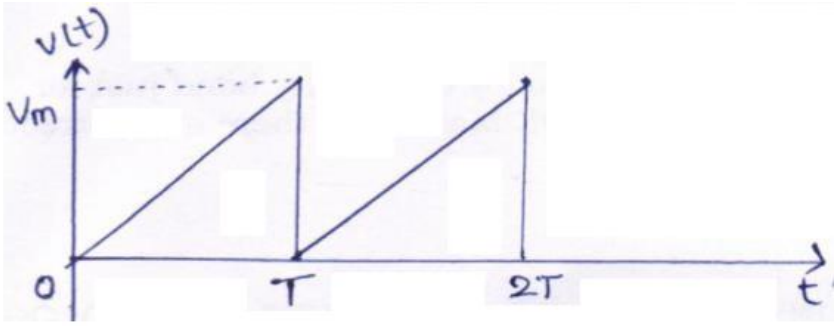
2. Derive an expression for the current, impedance and phase angle of (i) series RL and (ii)series RC circuit when it excited by alternating supply. [L2,CO3][5M]

3.(a) Define the following terms
(i) Impedance (ii) Admittance (iii) Alternating Voltage [L1,CO3][5M]

(b) The impedances of series circuit are Z1=(6+j8) and Z2=(8-j6) ohm. If the applied voltage is 120V.
Find (i) Impedance (ii) current (iii) power factor. [L3,CO3][5M]

4.(a) Explain the following terms
(i) Instantaneous value (ii) peak value (iii) peak to peak value (iv) form factor [L1,CO3][5M]
(b) Define the following terms
(i) Active Power (ii) Reactive Power (iii) Apparent Power [L1, CO3][5M]

5. Determine RMS, Average value for the waveform shown. [L2, CO3][10M]



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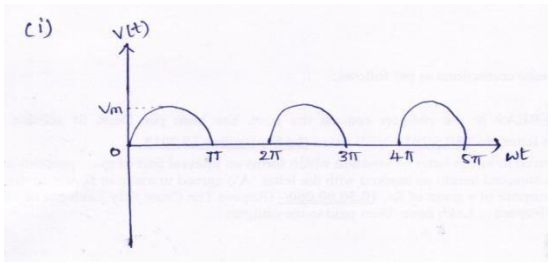
6. (a)Derive an expression for the current, impedance and phase angle of a series RLC circuit excited by sinusoidally alternating voltage. [L3,CO3][5M]

(b) A series circuit consisting of 10Ω resistor, 100μF capacitor and 10mH inductor is driven by a 50Hz a.c. voltage source of maximum value is 100V. Calculate (i) Impedance (ii) Current (iii) Phase angle [L4,CO3][5M]

7. (a) Derive expression for RMS value of sinusoidal wave form [L3,CO3][5M]
(b) Derive expression for Average value of sinusoidal waveform [L2,CO3][5M]

8. (a) Explain phasor relation for R,L and C elements with neat waveform. [L1,CO3][5M]
(b) A resistor of 50 ohm and inductance of 10mH are connected in series across 200V,50Hz supply.
Determine (i) Impedance (ii) Current (iii) Power factor [L4,CO3][5M]

9. Determine (i) RMS Value (ii) Average Value (iii) Form Factor for the wave form. [L5,CO3][5M]



10. Prove that form factor = 1.11 for sinusoidal wave form. [L4,CO3][5M]

UNIT-III
DC MACHINES

1. Explain constructional details of DC machine with neat sketchs [L1,CO4][10M]

2. Explain principle of operation of a DC generator [L2,CO4][10M]

3. (a) Derive EMF equation of a DC generator [L2,CO4][10M]

   (b) Explain OCC characteristics of DC Generator [L3,CO4][10M]

4. The armature of a 6-pole wave wound DC generator 604 conductors. Calculate the generated EMF when the flux per pole is 60 mWb and speed is 250 rpm. At what speed armature to be driven in order to generate EMF of 550V if the flux per pole is reduced to 58mWb. [L5,CO4][10M]

5. (a) Define back e.m.f. and derive an expression for torque in a DC motor. [L3,CO4][5M]

   (b) List out various types of DC generators and draw diagrams [L1,CO4][5M]

6. Explain various losses occur in a single phase transformer [L3,CO5][5M]

7. Define motor. Explain working principle of DC motors in detail [L2,CO4][10M]

8. (a) List out various methods of speed control [L3,CO4][2M]

   (b) Explain (i) Flux Control (ii) Armature resistance control methods of DC motor [L2,CO4][8M]

9. Explain function the each part of DC Generator
   (i) Yoke (ii) Commutator (iii) Field System (iv) Brush (v) Armature core [L1,CO4][10M]

10.(a) Explain Faradays Laws of Electro Magnetic Induction [L1,CO4][5M]
   (b) List out applications of DC generators [L2,CO4][5M]

UNIT- IV
AC MACHINES

1. Explain construction of a single –phase transformer with neat sketches. [L2,CO4][10M]

2. Explain the Working principle of single –phase transformer. [L1,CO4][10M]

3. Discuss Open Circuit and Short Circuit tests on single phase transformer. [L3,CO5][10M]

4. Write the short notes on the following wrt transformer. [L3,CO5][10M]
(i) Voltage regulation (ii) Efficiency (iii) Eddy Current loss (iv) Hysteresis loss (v) copper loss

5. Explain construction and principle of operation of alternator. [L2,CO5][10M]

6. Define voltage regulation of an alternator. Explain procedure to determine voltage regulation by Synchronous Impedance Method. [L3,CO5][10M]

7. Explain construction details of induction motor in detail. [L2,CO5][10M]

8. Explain principle of operation of induction motor [L2,CO5][10M]

9. Write short notes (i) Salient pole (ii) Cylindrical rotor of an induction motor. [L3,CO5][10M]

10. Discuss the following with respect to induction motor

(i) Slip ring rotor (ii) Wound rotor [L5,CO5][10M]

UNIT – V
MEASURING INSTRUMENTS

1. Define torque. Explain various types of torques in measuring instruments. [L1][CO6][10M]

2. Explain operating principle of Permanent Magnet Moving Coil (PMMC) instruments.[L2][CO6][10M]

3. Explain operating principle of Moving Iron (MI) instruments. [L2][CO6][10M]

4. Discuss features of measuring instruments. [L2][CO6][10M]

5. What is the purpose of voltmeter? Explain how the meter range will be extended with multipliers. [L3][CO6][10M]

6. Explain the extension of range of ammeters and derive necessary formula. [L3][CO6][10M]

7. (a)Classify different types of measuring instruments. [L1][CO6][4M]

(b) Explain operating principles of Moving Iron and PMMC instruments. [L2][CO6][6M]

8. Explain construction and principle of Moving Coil Voltmeter in detail [L2][CO6][10M]

9. Explain construction and operating principle of Moving Coil Ammeter in detail [L2][CO6][10M]

10. Explain construction and operation of attraction type Moving Iron Instrument. [L2][CO7][10M]

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