Model Viva Questions for"**Name of the Lab: Network analysis Lab**

Common to: **III sem(ET&T)**

Title of the Practical1&2: Apply the Kirchoff's law for finding current in a complex electrical circuit& apply the Thevenin's theorem for finding current in a complex electrical circuit.

Q1.What is resistance?

A1the resistance is the property of a material to oppose the flow of current in a material.its unit is ohm.

Q2. What are the material used for resistor?

A2 the material used are maganin (alloy of copper magnese and nickel),constantan(alloy of nickel and copper).

Q3.what is inductance?

A3 It is the property of a material by virtue of which it opposes any change of magnitude and direction of current passing through the conductor.

Q4. what happens to voltage when current through the inductor is constant?

A4 The voltage across inductor is zero.

Q5.how will you define capacitance?

A5 It is the ability to store electric charge within it.Capacitance is a measure of charge per unit voltage that can be stored in an element.

Q6.What happens to voltage when current is zero?

A6 the voltage is constant.

Q7.When we use 3 terminal resistor?

A7 It is used when resistance is less than 1 ohm.

Q8.what is the unit of charge and current?

A8 the units are coulomb and ampere.

Q9.What are the properties of a resistor?

A0 the properties are high resistivity ,resistance to oxidation, corrosion and moisture.

Q10. what is Q factor?

A10the Q factor is ratio of inductive reactance to resistance of a coil.

Q11. What are the material used for inductance coil?

A11 the materials used are marble because it is unaffected by atmospheric conditions.

Q12.Which capacitor is preferred for high voltage and frequency?

A12 The vaccum and gas filled capacitor are used for high voltage and frequency applications.

Q13.State Kirchoff current law?

A13 The algebraic sum of currents at any node of a circuit is zero. The sum of incoming current is equal to sum of outgoing current.

Q14 What are dependent sources?

A14 When strength of voltage or current changes in the source for any change in the connected network they are called dependent sources.

Q15 List examples of voltage source?

A15 The examples of voltage source are battery and generator.

Q16 List examples of current sources?

A16 semiconductor devices like transistor and diode are treated as current sources.

Q17 state Kirchoff voltage law?

A17 Kirchoff voltage law states that the algebraic sum of all branch voltages around any closed loop of a network is zero at all instant of time.

Q18 State TheveninTheorem?

A18 This theorem states that any linear network with output terminal AB can be replaced by a single voltage source V in series with a single impedance.

Q19 How equivalent impedance is calculated in TheveninTheorem?

A19 All independent voltage sources are short circuited and all independent current sources are open circuited.

Q20 What is the limitation of Kirchoffs law?

A20 It fails in distributed parameter network.

Title of the Practical 3 &4 Verify the Norton's theorem.& Verify following theorems: ASuper position theorem B.Maximum power transfer theorem for circuits

Q1 State Nortons theorem?

A1This theorem states that any linear bilateral network with active network with output terminals AB

Can be replaced by a single current source in parallel with a single impedance Z..

Q2 Is the theorem applicable to ac sources?

A2 No it is applicable to dc circuits with and without controlled sources.

Q3 Define Norton equivalent circuit?

A3 The Norton equivalent circuit is a current generator which is placed in parallel to internal resistance.

Q4 State Superposition theorem?

A4 If a number of voltages or current sources are acting simultaneously in a linear network the resultant current in any branch is the algebraic sum of current that would be produced in it when each source acts alone replacing all other independent sources by their internal resistances.

Q5 Sate Maximum power transfer theorem?

A5 A resistance load being connected to a dc network receives maximum power when load resistance is equal to internal resistance.

Q6 What is the efficiency during maximum power transfer?

A6 50%.

Q7 Define branch?

A7 It is a part of a network which lies between two junction points.

Q8Define active and passive network?

A8 The network which has no current or voltage source is called passive network.

The network which either has current or voltage source is called active network.

Q9 State Ohm's Law?

A9 The current through any conductor is directly proportional to the applied potential difference across it keeping physical condition unchanged.

Q10Define unilateral circuit?

A10 The circuit whose properties are not same in either direction is known as unilateral circuit.

Title of the Practical 5&6 : Observe the wave shape of an integrating circuit on the CRO. Observe the wave shape of a differentiating circuit

Q1 Define integrating circuit?

A1 Integrator is a electronic circuit whre output signai is the integral of the input waveform.

Q2 Is the integrator a low pass filter?

A2 low pass filter.

Q3 What is differentiating circuit?

A3 The electronic circuit where output voltage is the differentiation of input waveform.

Q4 Is the differentiator a high pass filter?

A4Yes.

Q5What is the role of feedback resistor in integrator?

A5 Both the stability and the loe frequency roll off problem can be corrected by addition of feedback resistor.

Q6 What is output when input to integarator is sine wave?

A6 the output is cosine wave.

Q7 What happens to gain with increase in gain of integrator?

A7 The gain decreases with 20 dB/ decade.

Q8 What is the purpose of r and feedback capacitor in differentiator?

A8 Both stability and high frequency noise problems can be crrected with R andC.

Q9 What happens to gain when frequency increases in differentiator?

A9 The gain increases with 20 dB/decade.

Q10What are applications of differentiator?

A10 It is most commonly used in wave shaping circuit to detect high frequency component and also as a rate of change detector in FM modulators.

Title of practical7: Use the filter circuit in musical light system.

Q1 Define filter?

A1 A network designed to attenuate certain frequencies but pass others without attenuation is called filter. A filter circuit thus possess atleast one pass band which is a band of frequency in which output is approximately equal to input and an attenuation band in which output is zero.

Q2 What are factors on which accuracy depends?

A2 The factors are signal to noise ratio, response time and bw over which measurement are desired.

Q3 What are elements of passive filter?

A3 The elements are inductor, capacitor and resistor.

Q4 Define design impedance?

A4 It is a T filter in which series arm Z1 and shunt Z2 are connected by relationship Z1*Z2 =R*Rcalled impedance design.

Q5 Define low pass filter?

A5 The gain is constant over a frequency range starting from zero to cutoff frequency .The output of any signal having a frequency greater than cutt off frequency will be attenuated , there will be no output voltage for frequencies greater than f.

Q6 Define high pass filter?

A6 The high pass filter has a zero gain starting from zero to cutt off frequency.Above this cutt off frequency gain is constant equal toA.

Q7 Define all pass filter?

A7 In this filter all frequencies are passed without attenuation .The important features of this filter is that it provides predictable phase shift for frequencies of different input signals.

Q8 What are advantages of active filter over passive filter?

A8 The advantages are 1. gain and frequency adjustment flexibility.

2. No loading problem 3. Cost is low.

Q9 What is the slope of first order low pass Butterworth filter?

A9 The slope is -20dB/deacde.

Q10 What is the slope of first order high pass Butterworth filter?

A10 The slope is 20dB/deacde.

Title of the Practical 8 : Develop a circuit for simple project based on network analysis Q1
Explain Ohm's law?

A1: "The current passing though a conductor is directly proportional to the potential difference across the ends of the conductor "

Q2 what are limitatations of Ohms law?

A2: The main limitation of Ohm's law is that physical dimension of the conductor should not change with temperature.

Q3 Define current?

A3: The rate of change of charge with respect to time is called electric current.

Q4 Explain Kirchoff's current law?

A4 According to kirchoff's current law" in any network of conductors in an electrical circuit the algebraic sum of the current in all the conductors meeting at any point is zero.

Q5 Explain electric field strength?

Ans: Electric field strength at any point is define as the mechanical force experienced by a unit positive charge placed at that point in the electric field.

Q6 define resistivity?

A6: The resistance offered by one meter length of wire having an area of cross section of one square meter is called the resistivity of material.

Q7. Define conductance?

A7: the ease to the flow of current is called conductance.

Q8 what do you mean by a Conductivity?

Ans: Conductivity is basically the property or nature of the material due to which it allows the current to flow through it.

Q9 what do you mean by a electrical power?

A9: The rate at which work is being done ia an electrical circuit is called electrical power.

Q10 what do you mean by a heat energy?

A10: The form of energy which produces a sensation of warmth is called heat.

Title of the Practical 9 : Measurement of capacitance of a condenser without using R-L-C bridge

Q1 Define resonance?

A1 Resonace in electrical circuit consist of passive and active elements represents a particular state of circuit when current or voltage in the circuit is maximum or minimum .

Q2 What is the value of power factor?

A2 Power factor is 1.

Q3 What is the phase difference between voltage and current in a inductor? Which is leading?

A3 Phase difference is 90 degree and current is leading.

Q4 What is the phase difference between voltage and current in a capacitor? Which is leading?

A4 Phase difference is 90 degree and voltage is leading.

Q5 Define selectivity?

A5 The selectivity of a resonating circuit is defined as ratio of frequency of resonance to bandwidth of the circuit.

Q6 Define bandwidth?

A6 The frequencyband within the limits of lower and upper half power frequency is called bandwidth.

Q7 What is the effect of resistance in RLC circuit?

A7 The effect is to flatten the curve.

Q8 Which circuit is more responsive?

A8 The circuit with flat response is more responsive.

Q9 For RLC circuit what is power factor at lowest powerfrequency ?

A9 The power factor is 0.707 leading.

Q10 What is the locus of voltage phaser across R in series RLC circuit?

A10 The phasor is circle.

Title of the Practical 10 : Study the function of the following filters:

a. Low pass filter High pass filter Band pass filter.

Q1 Define filter?

A1 A filter is an electrical network that can transmit signals within a specified frequency range?

Q2List the characteristics of filter?

A2 An ideal filter would transmit signals under the passband frequencies without attenuation and completely suppress the signal with attenuation band of frequencies with a sharp cutt off profile.

Q3 Define characteristics impedance?

A3The characteristics impedance of a filter matches with circuit to which it is connected throughout the pass band.

Q4 What is the unit of attenuation?

A4 The unit is decibel and neper.

Q5 What are the application of filter?

A5 the Filter is used in voice frequency telegraphy,multichannel communication, TV broadcasting and telephony.

Q6 Define active filter?

A6 The active filter contains components like operational amplifier that introduce some gain in the signal.

Q7 List advantges of active filter over passive filter?

A7 Active filter eliminate bulky components.It offer gain.It can drive low impedance loads.It is easy to tune.

Q8 List the disadvantages of constant K filters?

A8 The attenuation does not increase rapidly beyond cutt off frequency.

characteristics impedance varies widely in the pass band from desired value.

Q9 Define cuttoff frequency?

A9 The frequency that seperates the pass and attenuation band is known as cutt off frequency.

Q10 How a band pass filter is constructed?

A10 This filter is a combination of two parallel tuned circuit.This is a special type of LC filter alongwith a particular BW frequency to be allowed through it.

Title of the Practical 11: Find different electrical parameter in R-L, R-C, R-L-C, series circuits and draw the phases diagram, also: Determine current and P.F. in each case.Determine and observe the resonance condition.

Q1 In a RLC circuit What is the value of current?

A1 The current is maximum and minimum in parallel.

Q2 Define time constant of capacitor circuit?

A2 Time constant of a capacitance may be defined as time during which voltage rises to 63.2% of its final steady value.

Q3 Does the value of current depends on reactance series RLC circuit?

A3 It depends on resistance,inductive and capacitive reactance.

Q4 Define power factor?

A4 The power factor is defined as the ratio of true power and apparent power.

Q5 In series RLC circuit what is the phase difference between current and voltage?

A5 Phase difference is 0 degrees.

Q6Define resonance curve?

A6 The resonance curve for a series circuit is a plot of current and frequency.

Q7 Define reactive power?

A7 The product of rms voltage and current with sine of the angle between them is called reactive power.

Q8 Which parameter is leading in parallel RC circuit?

A8 Current leads voltage in parallel RC circuit.

Q9 Why parallel circuit is called rejector?

A9 Because R is low ,impedance is high and current is much lowerin parallel circuit.

Q10 What happens to Z when it attains selectivity?

A10 Z is large.

Q11 Define Q factor fpr parallel circuit?

A11 It is the current magnification of circuit at resonance.It represents ratio of two current in branch.

Title of the Practical 12 : Find different electrical parameter in R-C & R-L-C parallel circuit and draw the phasor diagram, also: find power and P.F. of the circuit. Observe parallel resonance condition

Q1 Define parallel resonance?

A1 In the parallel resonance capacitive current must be equal to inductive current. This circuit is called rejector circuit.

Q2 What is the value of power factor in parallel resonance?

A2 Power factor is unity.

Q3 What is value of susceptance at parallel resonance?

A3 It is zero.

Q4 What is the phase difference between current and voltage in RC parallel circuit?

A4 The phase angle is 90

Q5 Which quantity is leading in RC parallel circuit?

A5 Current leads voltage RC parallel circuit.

Q6 Define selectivity?

A6 The variation of magnitude of the voltage across the capacitor with frequency indicates that the voltage reaches a sharp peak just below resonance frequency.This is called selectivity.

Q7 What is the value of Q factor for RLC circuit?

A7 The Q factor is equal to voltage gain.

Q8 Which part of impedance produce heat?

A8 Resistive

Q9 Which part produce magnetic energy?

A9 inductive

Q10 Define 3dB points?

A10 The 3 dB point is the point at which power dissipation at bandwidth is half to that of power dissipation at resonance.