

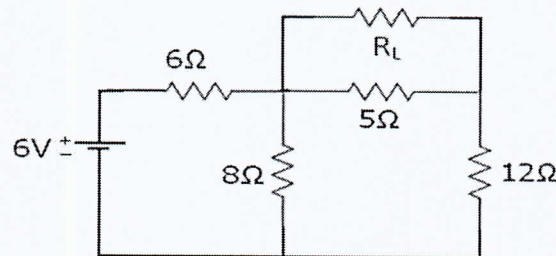
Faculty of Science
B.Sc. (Electronics) I Year, CBCS-I Semester
Backlog Examinations –June/July, 2022
PAPER: Circuit Analysis

Time: 3 hours

Max Marks: 80

Section-A

- I. Answer any *five* of the following (5x4=20 Marks)
1. Define Impedance and admittance?
 2. A sine wave has a peak value of 12 V. Determine the RMS value, Average value and form factor.
 3. State Thevenin's theorem.
 4. Find the value of R_L for the given network below that the power is Maximum?

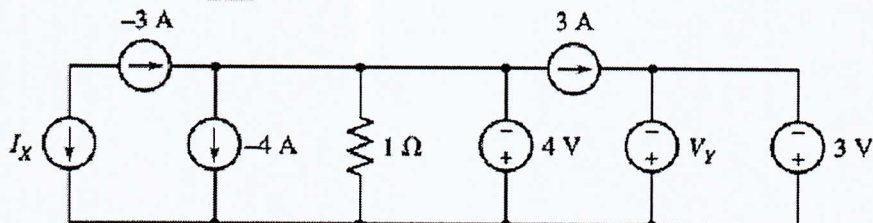


5. Distinguish between natural response and forced response of an electrical circuit
6. Draw the frequency responses of Low Pass filter, High Pass filter and Band pass filter.
7. Write the applications of CRO
8. A series RLC circuit has $R=10\Omega$, $X_C=20\Omega$ and $X_L=20\Omega$ is excited by a sinusoidal source of voltage 200V. What will the voltage across inductance

Section -B

- II. Answer the following (4x15=60 Marks)

9. (a) State Kirchoff Current Law and Voltage law, determine the values for I_x and V_y in the given circuit .

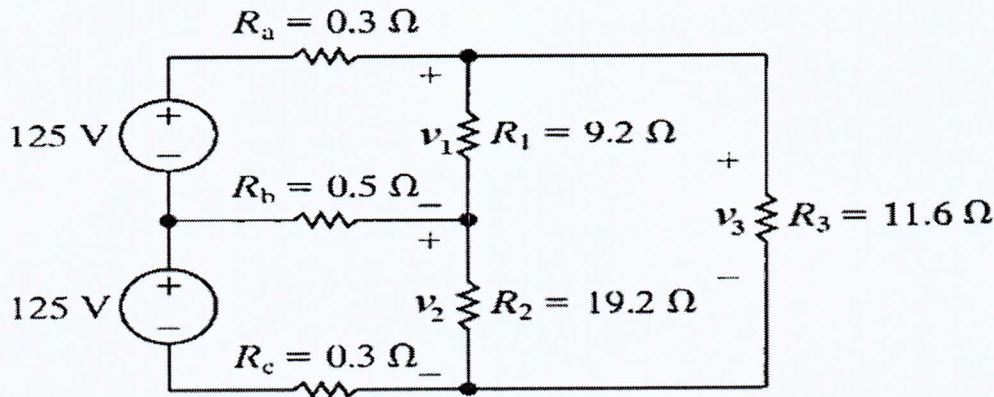


OR

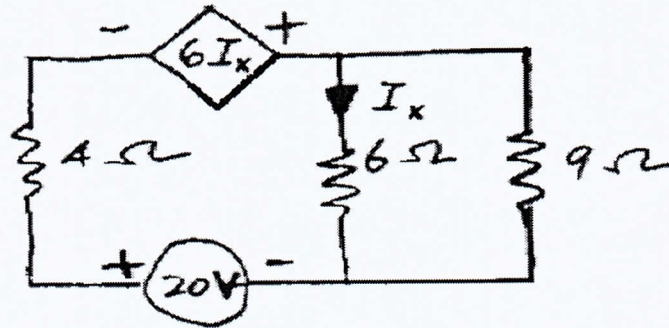
R-16

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- (b) In the following given circuit calculate i) V_1 , V_2 , & V_3 ii) power delivered to R_1 , R_2 and R_3 .



- 10.(a) Find the current through 9 ohm resistor using Thevenin's theorem as shown in figure

**OR**

- (b) State and prove Maximum Power transfer theorem with an example.

- 11.(a) Derive the expression and draw current response waveform of a series RC circuit for DC excitation.

OR

- (b) What is high pass filter? Explain the general configuration and parameters of a constant- K high pass filter

12. (a) Draw the block diagram of CRT and explain each part. Explain how time and frequency is measured using CRO.

OR

- (b) Derive the relation between bandwidth, resonant frequency and quality factor in series resonance circuit.

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Section-A

- I. Answer any EIGHT of the following questions (8x4=32 Marks)
1. Explain the node voltage analysis.
 2. Explain the terms a) Node b) Loop c) Active Network.
 3. Find the average value of current is given by $i = 10 \sin \omega t$.
 4. State and Prove Reciprocity Theorem.
 5. State and Prove Millman Theorem.
 6. Find the Time constant of RC circuit with the values $R=10k$, and $C=0.1\mu f$.
 7. Explain RL Circuit as High Pass Filter.
 8. Define and Derive expression for Quality factor
 9. An RL low pass filter $R=10 \text{ ohm}$ and $L=1mH$. Find the cutoff frequency.
 10. Explain RL circuit as a differentiator.
 11. Mention the uses of CRO.
 12. Calculate the resonance frequency and Q-factor for Series resonant circuit if $L=150 \mu H$, $C=20pF$ and $R=20\text{ohm}$.

Section-B

- II. Answer the following questions (4x12=48Marks)
13. (a) Define Average and RMS values of alternating currents and derive expression for them.

(OR)

(b) State and Explain Kirchhoff's laws. Discuss Loop current method.
 14. (a) State and Prove Norton's Theorem.

(OR)

(b) State and prove super position theorem
 15. (a) Discuss the transient response of RL Circuit containing DC Source.

(OR)

(b) Discuss the frequency response of RC Circuit.
 16. (a) Explain the Resonance in LCR Parallel Circuit and Obtain the resonance frequency.

(OR)

(b) Describe the block diagram of CRT.
