

Faculty of Sciences**B.Sc (Electronics) I-Year, CBCS-I Semester Backlog Examinations –January, 2021****PAPER: CIRCUIT ANALYSIS**

Time: 2 Hours

Max Marks: 80

I. Answer any four of the following questions (4x20=80 Marks)

1. Define average and RMS values. Explain in detail about complex impedance and admittance.
2. State and explain Kirchoff's voltage and current laws.
3. State and explain Thevenin's theorem. Find Thevenin equivalent circuit for following circuit:



4. State and explain Maximum power transfer theorem. Give its applications.
5. Obtain frequency response of an RC circuit.
6. What are different types of filters? Obtain frequency response of a high pass filter.
7. Obtain expression for resonant frequency of a RLC parallel resonance circuit.
8. Explain working of a cathode ray tube.

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 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 $L=1\text{mH}$. 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 $L=150 \mu\text{H}$, $C=20\text{pF}$ 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.

Faculty of Science

B. Sc (Electronics) I-Year, CBCS –I Semester Backlog Examinations -June, 2023

PAPER: Circuit Analysis

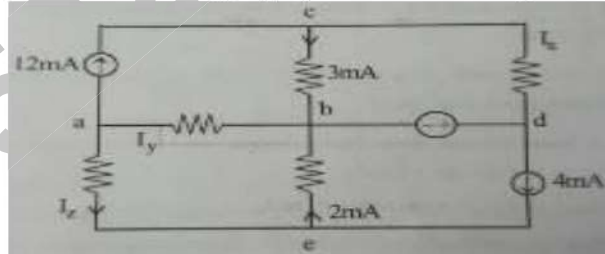
Time: 3 Hours

Max Marks: 80

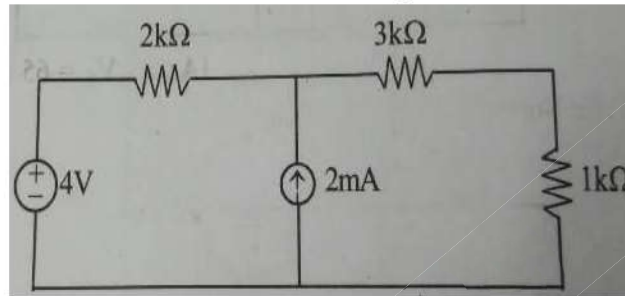
Section-A

I. Answer any EIGHT of the following questions (8x4=32 Marks)

1. Explain j operator with suitable examples.
2. With example explain the statement of KCL.
3. Find the values of branch currents I_x , I_y , I_z for the circuit given below Using KCL.



4. Briefly explain Milliman's theorem.
5. Write the significance of Norton's and Thevenin's theorems.
6. Find the Thevenin's and Norton's circuit for the given network



7. How can you discriminate the frequency response of RC and RL circuits?
8. Describe band pass filter.
9. In an RC low pass filter, the value of R is 5kΩ and cut-off frequency is 1kHz. Find the value of C.
10. Define band width, Q-factor and selectivity.
11. What is the principle of operation of CRO?
12. A parallel resonant circuit employs a 50pF capacitor and has a band width of 250KHz. Calculate the maximum impedance of the circuit.

Section-B

II. Answer the following questions (4x12=48 Marks)

- 13.(a) Derive equations for Average and r.m.s values of a Sine wave. And define Form factor.

(OR)

- (b) Define KCL and explain a method to find node voltage in a circuit containing multiple sources using node voltage method.

- 14.(a) State and prove maximum power transfer theorem and derive an expression for obtaining maximum power delivered to the load.

(OR)

- (b) State and prove Norton's theorem and explain how a Norton's equivalent circuit is related to Thevenin's equivalent circuit.

- 15.(a) What is a differentiator? Draw the circuit of a differentiator and obtain its output

expression. Draw its input and corresponding output waveforms.

(OR)

(b) Derive equations for growth and decay of current in a circuit containing inductance and resistance. What is meant by time constant of it.

16.(a) Obtain the expression for the resonant frequency of a series resonating circuit. How can you distinguish series and parallel resonant circuits?

(OR)

(b) With a neat block diagram explain the working of a CRO.
