Seat No.

Total No. of Pages : 3

MAR_APR 2026 SUMMER EXAMINATION

1154 B.Tech. CBCS

Sub. Name: Network Analysis

Sub. Code: 73248/77810

Day and Date: Monday ,18-05-2026 **Total Marks: 70**

Time: 10:30 AM To 01:00 PM

Instructions:
1. **All questions are compulsory**
2. **Assume suitable data wherever necessary and mention it boldly**
3. **Draw neat labelled diagrams wherever necessary**
4. **Figures to the right indicate full marks**

Special Inst.: Use of a non-programmable scientific calculator is allowed.

Q1) Solve the following MCQs. **[14]**

i. According to KCL, the algebraic sum of currents at a node is:
- A. Equal to voltage
- B. Equal to power
- C. Equal to Zero
- D. Always Maximum

ii. Which theorem is used to simplify a circuit into a single voltage source with series resistance?
- A. Norton's theorem
- B. Thevenin's theorem
- C. Superposition theorem
- D. Reciprocity theorem

iii. At resonance in a series RLC circuit, the power factor is:
- A. Zero
- B. Leading
- C. Lagging
- D. Unity

iv. Z-parameters are also known as:
- A. Admittance parameters
- B. Hybrid parameters
- C. Impedance parameters
- D. Transmission parameters

v. In an RC circuit, the voltage across the capacitor rises:
- A. Linearly
- B. Exponentially
- C. Sinusoidally

25985

D. Constantly

vi. A tree in a network graph contains:

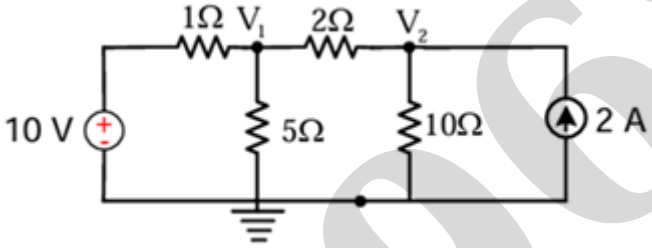
A. All branches
B. No nodes
C. All nodes but no loops
D. Only loops

vii. A high-pass filter blocks:

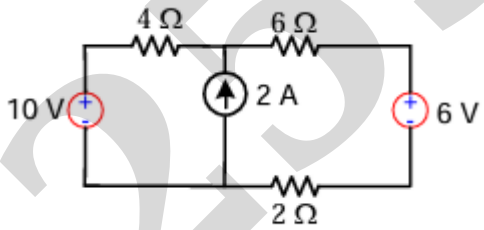
A. High frequencies
B. Low frequencies
C. All frequencies
D. None of the above

Q2) Attempt any Two.

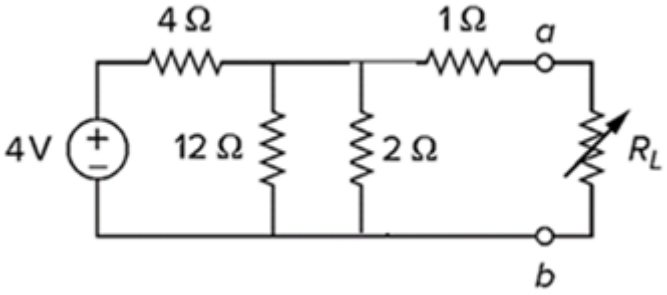
a. Find the node voltages V1 & V2. **[7]**



b. Find the current flowing through 2Ω resistance using mesh analysis. **[7]**



c. Find the Norton's equivalent of the circuit shown below across terminals a-b. **[7]**



Q3) Attempt any Two.

a. Explain the step-wise process to solve any circuit by using the superposition theorem. **[7]**

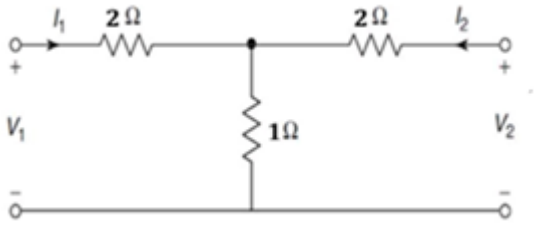
25985

b. For the RLC series circuit, C=6uF, L=1mH, R=5 Ω **[7]**
Find, i) Resonant frequency ii) Quality factor iii) Bandwidth.

c. Discuss the relationship between Z, XC, and XL with frequency for a series RLC circuit. **[7]**

Q4) Attempt any Two.

a. Find Z-parameters of the given network. **[7]**



b. Obtain Y-parameters in terms of Z-parameters and vice versa. **[7]**

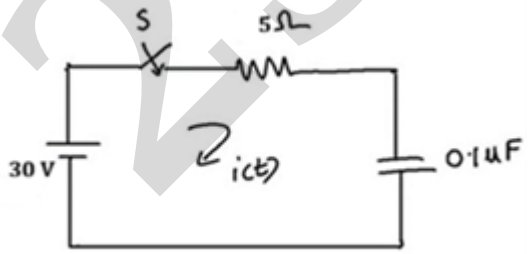
c. Obtain DC response of series RL circuit. **[7]**

Q5) Attempt any Two.

a. Design a constant K low-pass filter having a cutoff frequency of 3 kHz to operate with a terminal load resistance of 500 Ω. **[7]**

b. Obtain an expression for characteristic impedance Z0 for a π-network. **[7]**

c. The switch in the figure is open for a long time and closes at t = 0. Determine i(t) at t > 0. **[7]**



End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -
This Question Paper may be distributed for following Subjects as common code.
सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (101) Bachelor of Engineering (77810) Network Analysis Part 2 SEM 3
2] (1154) B.Tech. CBCS (73248) Network Analysis Part 2 SEM 3