

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATIONS- 2026

B.Tech Semester (Backlog)

COURSE CODE (CREDITS): 18B11EC211 / 24B11EC211 (4)

MAX MARKS: 35

COURSE NAME: ELECTRICAL SCIENCES / BASIC ELECTRICAL ENGINEERING

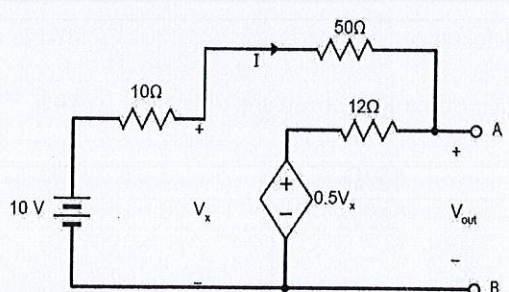
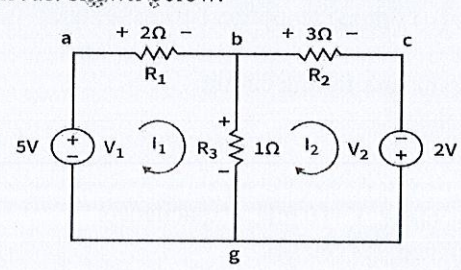
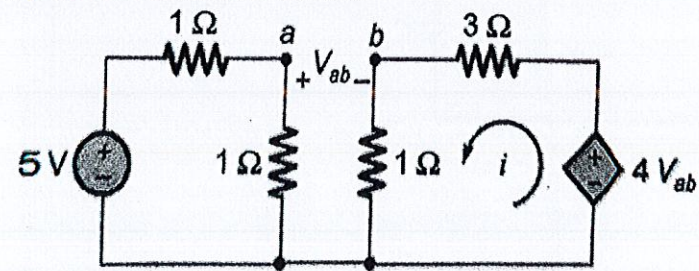
COURSE INSTRUCTOR: Dr Rajiv Kumar

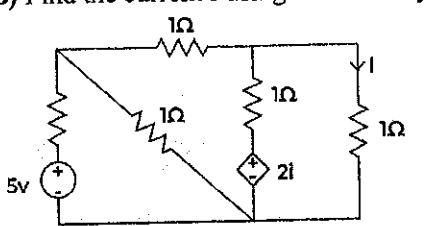
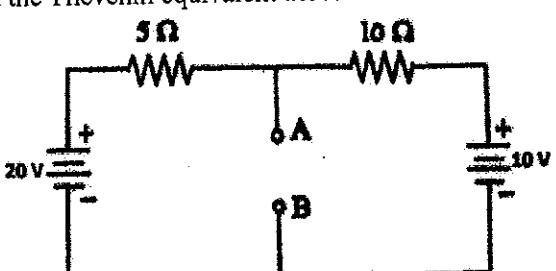
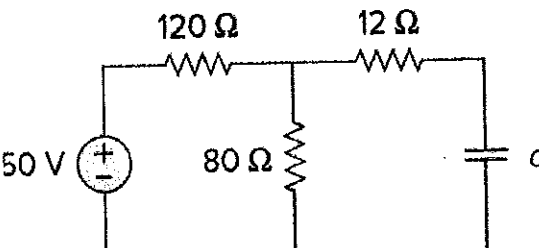
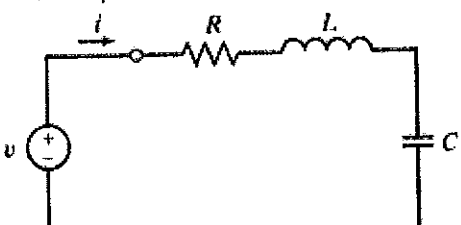
MAX. TIME: 2 Hours

Note: (a) All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

(c) Use of scientific calculator is allowed

Q.No	Question	CO	Marks
Q1	(A) Define the following with SI units: (i) Charge, (ii) Current, (iii) Voltage, (iv) Power (B) Determine the voltages V_x and V_{out} in the circuit shown below. Also determine the current through each element of the circuit. 	CO-1	2+3=5
Q2	(A) State Kirchhoff's Current Law and Kirchhoff's Voltage Law (B) Using Kirchhoff's Voltage Law, determine the current flowing through each loop of the circuit shown below. 	CO-2	2+3=5
Q3	(A) Differentiate between independent sources and dependent sources. Also list the four types of dependent sources. (B) Obtain the current i in the network? 	CO-3	2+3=5

Q4	(A) Explain the procedure of nodal analysis. (B) Find the current I using Mesh Analysis. 	CO-3	2+3=5
Q5	(A) State Thévenin's theorem and Norton's theorem. (B) Find the Thévenin equivalent across terminals A-B. 	CO-4	2+3=5
Q6	(A) Define capacitance and inductance. Also write expressions for energy stored in capacitor and inductor. (B) Determine the time constant of the RC circuit shown below. Take $C = 700 \text{ mF}$ 	CO-4	2+3=5
Q7	(A) Define: (i) Natural response. (ii) Forced response. (iii) Resonance in RLC circuit (B) Determine the following parameters for the circuit: 1. Resonant angular frequency 2. Quality factor Q 3. Bandwidth BW The circuit parameters are: Inductance, $L=10 \text{ mH}$, Capacitance: $C=0.01 \mu\text{F}$ and Resistance: $R=100 \Omega$ 	CO-5	2+3=5