Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S2 (R) Examination May 2025 (2024 Scheme)

Course Code: PCECT205

Course Name: NETWORK THEORY

Max. Marks: 60 Duration: 2 hours 30 minutes

PART A

(Answer all questions. Each question carries 3 marks)

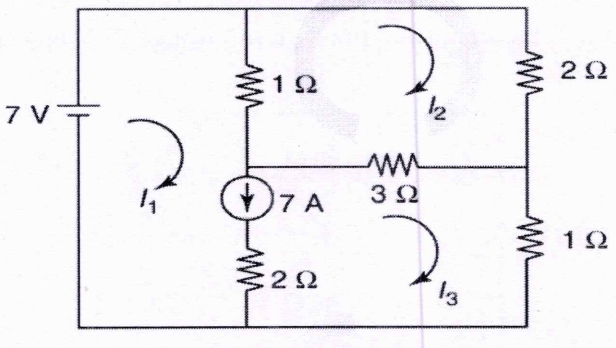
		CO	Marks
1	State and explain Kirchoff's current law and Kirchoff's voltage law.	CO1	(3)
2	Describe about independent and dependent sources.	CO1	(3)
3	List and explain the steps involved in determining Norton's equivalent circuit.	CO2	(3)
4	State and prove maximum power transfer theorem	CO2	(3)
5	Explain the transformation of inductance and capacitance to s-domain.	CO3	(3)
6	Derive the impulse response of RL series circuit.	CO3	(3)
7	List any six properties of transfer functions.	CO4	(3)
8	Derive the expressions for transmission parameters.	CO4	(3)

PART B

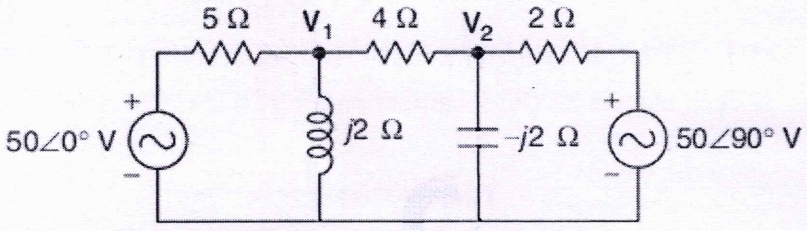
(Answer any one full question from each module, each question carries 9 marks)

Module -1

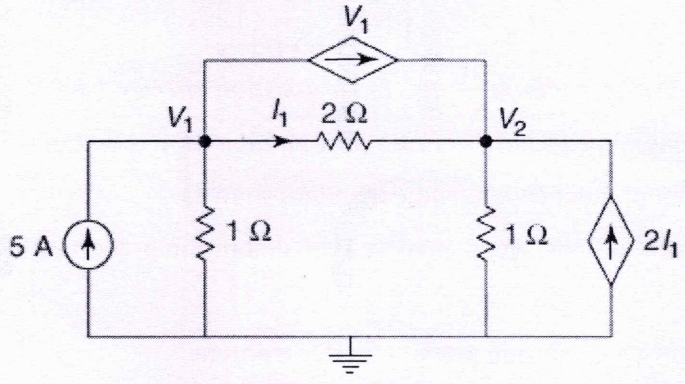
9 a) Find the current through 3Ω using mesh analysis. CO1 (5)



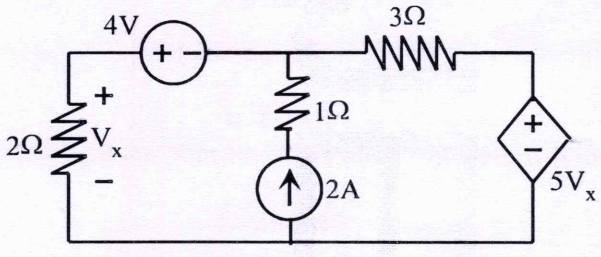
b) Find the node voltage V_1 using node analysis. CO1 (4)



10 a) Find the voltages V_1 and V_2 in the following network using node analysis. CO1 (5)

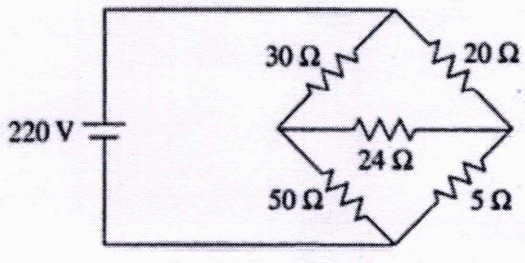


b) Determine the current through 3Ω resistor in the network shown below using super mesh analysis. CO1 (4)

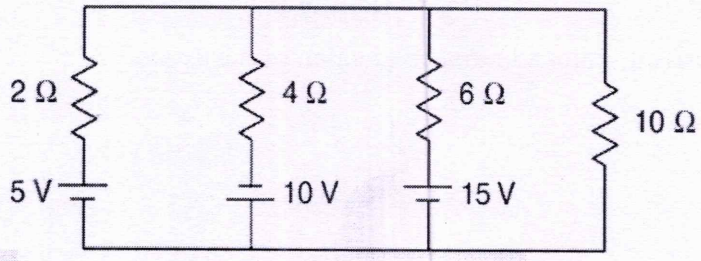


Module -2

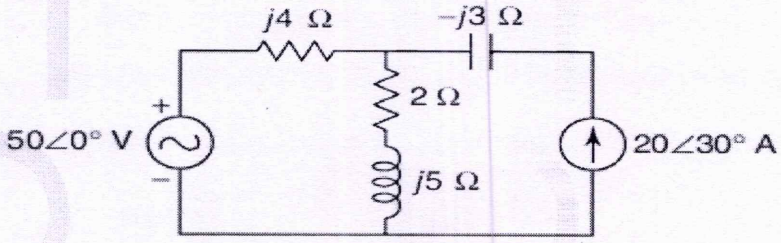
11 a) Using Thevenin's theorem, find the current through 24Ω resistor. CO2 (5)



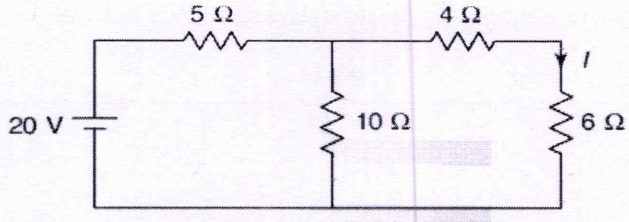
b) Find the current through 10 Ω using Millman's Theorem CO2 (4)



12 a) Find the current through (2+j5) impedance using superposition theorem. CO2 (5)



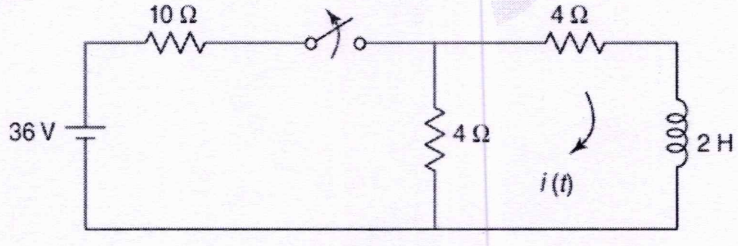
b) Find the current I and verify reciprocity theorem for the network shown below. CO2 (4)



Module -3

13 a) Find the inverse Laplace transform of $F(s)=\dfrac{5s^2-15s-11}{(s+1)(s-2)^2}$. CO3 (5)

b) The network shown in Figure has acquired steady-state with the switch closed for t < 0. At t = 0, the switch is opened. Obtain i (t) for t > 0. CO3 (4)

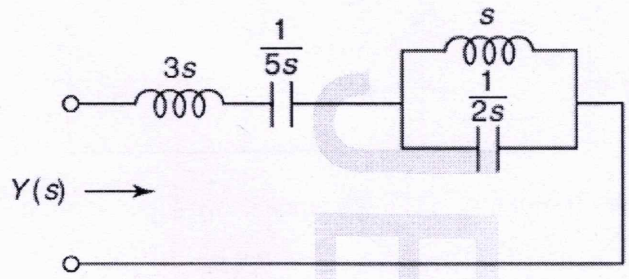


14 a) Obtain the transient current response of a series RC circuit when subjected to DC input voltage 'V'. CO3 (5)

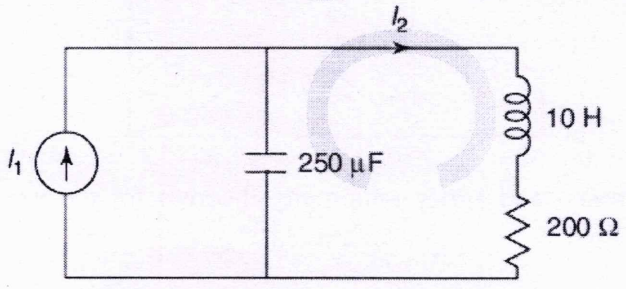
b) Solve $\dfrac{dy}{dt}+2y=e^{-3t};\quad y(0)=1$ CO3 (4)

Module -4

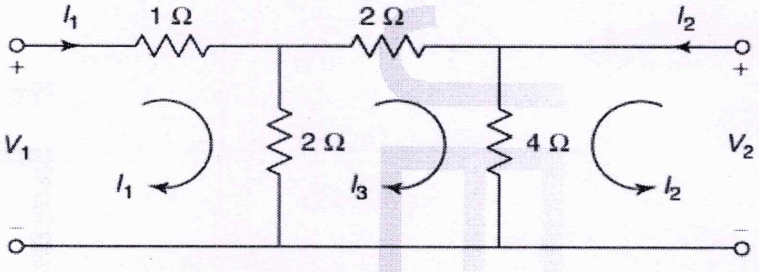
15 a) Find the driving-point admittance function of the network. CO4 (4)



b) Draw the pole-zero diagram of I_2/I_1 for the network shown in figure. CO4 (5)



16 a) Determine hybrid parameters of the network shown below. CO4 (5)



b) Explain the series connection of two port networks. CO4 (4)