Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S2 (S) Examination January 2026 (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)

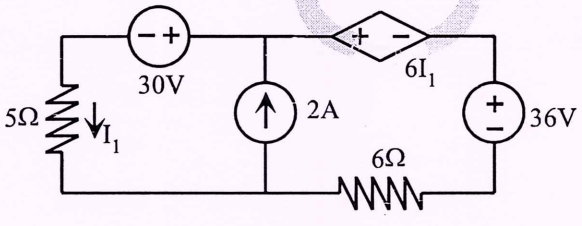
		CO 1	Marks
1	Differentiate between ideal and practical voltage source.	CO1	(3)
2	Differentiate between super mesh and super node.	CO1	(3)
3	Prove that maximum power will be transferred to the load when load resistance is equal to the source resistance.	CO2	(3)
4	State and explain reciprocity theorem	CO2	(3)
5	Derive the time domain response of the RL circuit with step input	CO3	(3)
6	Draw the parallel and series model s-domain equivalent circuits for an inductor .	CO3	(3)
7	Express the Y parameters in terms of the Z parameters.	CO4	(3)
8	Illustrate the equivalent circuit representation of hybrid parameters	CO4	(3)

PART B

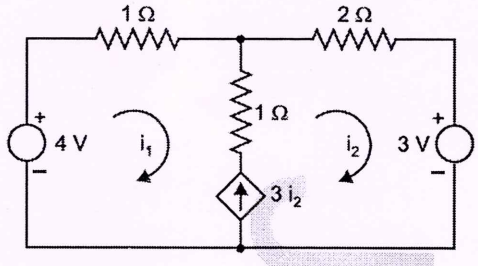
(Answer any one full question from each module, each question carries 9 marks)

Module -1

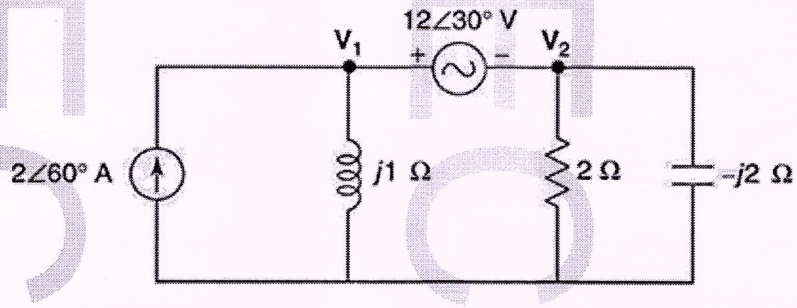
9 a) Use Nodal analysis to obtain current flowing through 5Ω resistor CO1 (5)



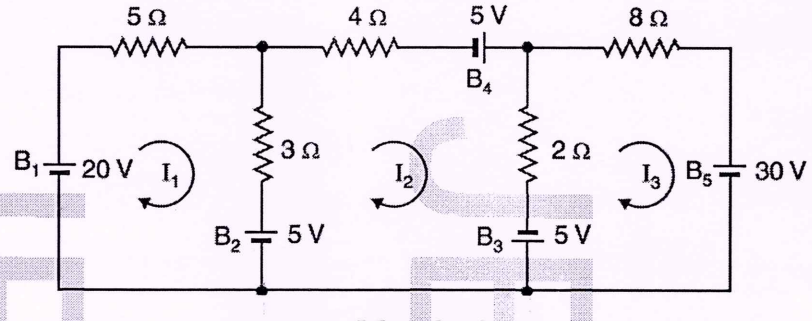
b) Solve the network using mesh analysis to find mesh currents CO1 (4)



10 a) Obtain node voltage V_2 for the given network. CO1 (5)

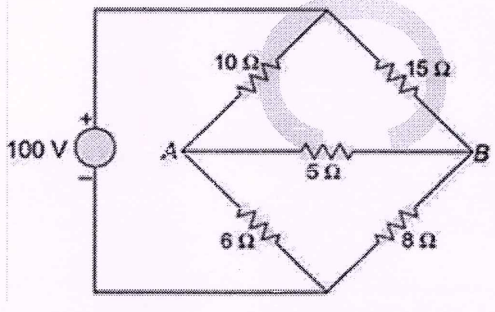


b) Obtain mesh currents using mesh analysis. CO1 (4)

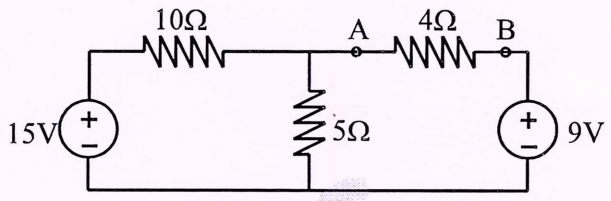


Module -2

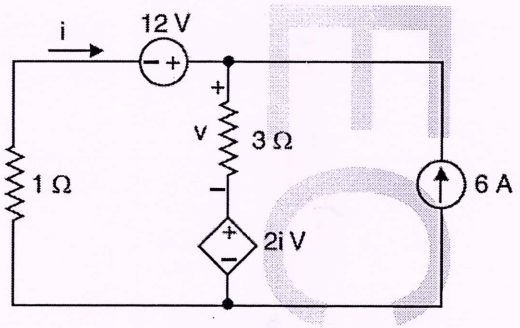
11 a) Use Thevenin's theorem to find current through 5Ω resistor CO2 (5)



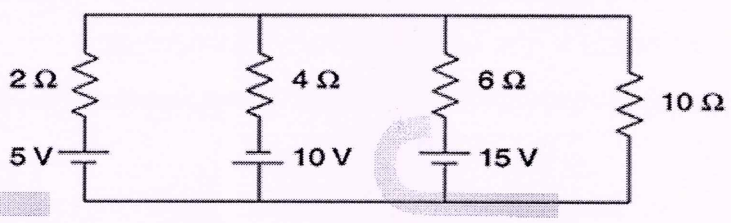
b) Obtain Norton equivalent circuit of the network shown in figure . CO2 (4)



12 a) By using superposition theorem find the value of voltage across 3-ohm resistor. CO2 (5)



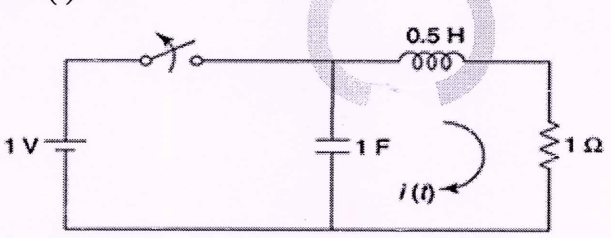
b) Find the current through 10-ohm resistor using Millman's theorem CO2 (4)



Module -3

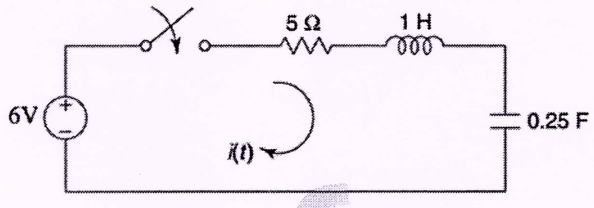
13 a) Define unit step function and unit impulse function and find its Laplace transform. CO3 (4)

b) In the network the switch is opened at t=0 and steady state condition achieved before t=0.Find i(t) CO3 (5)



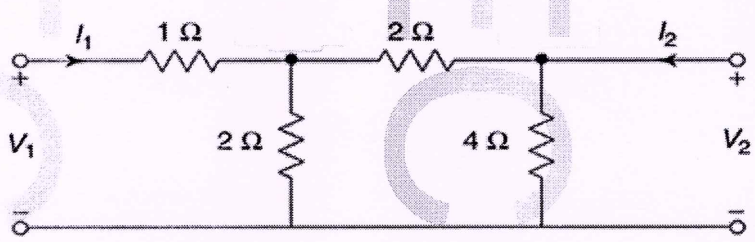
14 a) Find the inverse Laplace transform of $F(s)=\frac{s+2}{s^2(s+3)}$ CO3 (4)

b) For the network shown in figure the switch is closed at t=0. Determine the current i(t) assuming zero initial conditions in the network elements. CO3 (5)

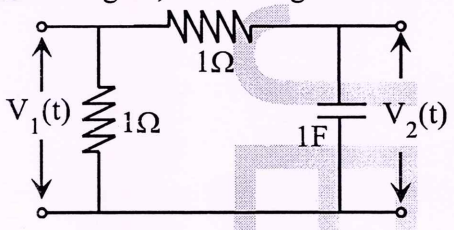


Module -4

15	a)	Explain the significance of poles and zeros in network function	CO4	(3)
	b)	Determine Y parameters of the circuit and check whether the circuit is reciprocal	CO4	(6)



16	a)	Show that when two port networks are connected in parallel , the resultant Y matrix is the sum of Y matrices of each individual network.	CO4	(5)
	b)	For the network shown in figure, find voltage transfer function $V_2(s)/V_1(s)$.	CO4	(4)



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