Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER– III (New) EXAMINATION – WINTER 2019

Subject Code: 3131707   Date: 3/12/2019
Subject Name: Network Analysis
Time: 02:30 PM TO 05:00 PM   Total Marks: 70
Instructions:
1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

MARKS

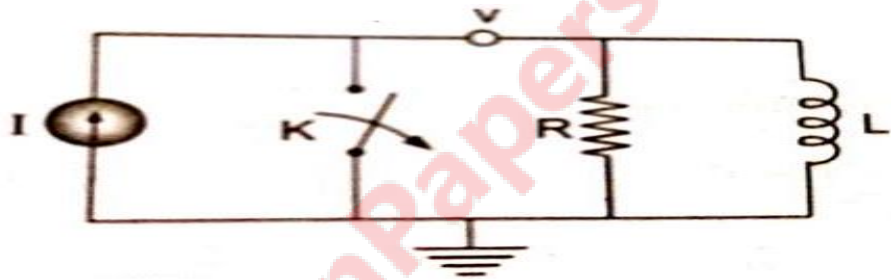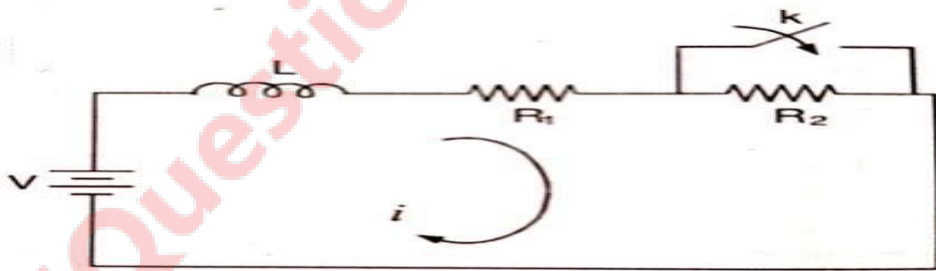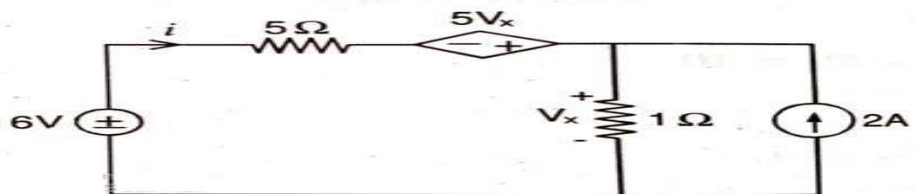|			
Q.1	**(a)**	State and explain superposition theorem.	**03**
	(b)	Explain the characteristics of an ideal voltage source.	**04**
	(c)	What is time constant? Explain time constant in terms of RL and RC circuits.	**07**
Q.2	**(a)**	State and explain reciprocity theorem.	**03**
	(b)	Briefly describe KVL and KCL.	**04**
	(c)	Find the currents I_1, I_2, I_3 and I_4 for the network shown in Figure 1.	**07**
		OR	
	(c)	Briefly describe the application of Laplace transform for transfer function approach in circuit analysis.	**07**
Q.3	**(a)**	Briefly describe millman's theorem.	**03**
	(b)	What is duality? Explain with example.	**04**
	(c)	Explain the procedure to obtain sinusoidal steady state response of a circuit.	**07**
		OR	
Q.3	**(a)**	State and explain initial value theorem.	**03**
	(b)	State and explain maximum power transfer theorem for AC and DC circuits.	**04**
	(c)	Find the voltage drop across x-y for Figure 2.	**07**
Q.4	**(a)**	Determine Y parameters in terms of Z parameters.	**03**
	(b)	Explain significance of poles and zeros in network functions.	**04**
	(c)	In the network shown in Figure 3, the switch k is opened at t=0. Solve for v, dv/dt and d^2v/dt^2 at t=0+ if I=10 A, R=10 Ω and L=1 H.	**07**
		OR	
Q.4	**(a)**	Determine H parameters in terms of Z parameters.	**03**
	(b)	State and explain source transformation method.	**04**
	(c)	In the network shown in Figure 4, the switch k is closed at t=0, a steady state having previously been attained. Find the particular solution for the current.	**07**
Q.5	**(a)**	Define unilateral and bilateral network, Active and passive network.	**03**
	(b)	Derive the condition for the network to be reciprocal for ABCD parameters.	**04**
	(c)	Determine i in a circuit of Figure 5 using superposition theorem.	**07**
		OR	
Q.5	**(a)**	List the advantages of Laplace transformation over classical method.	**03**
	(b)	What is initial condition? Explain the effect of initial condition on the elements of network.	**04**
	(c)	Explain how Laplace transform is useful in obtaining the transient response of a second order system.	**07**
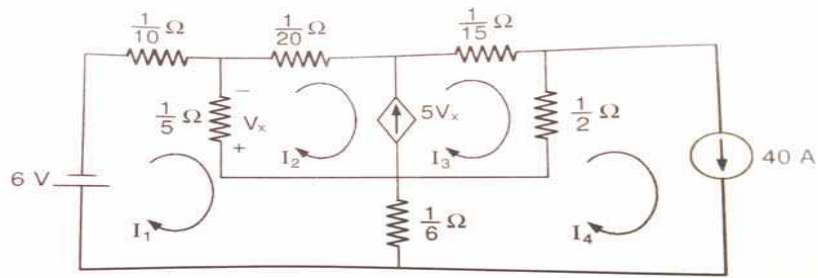
Figure 1
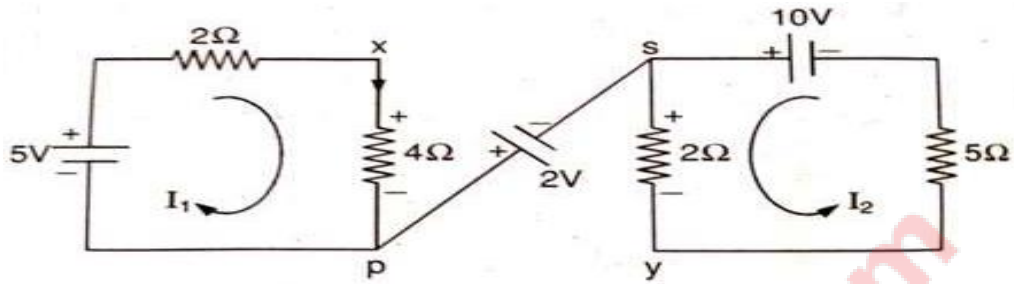
Figure 2

Figure 3

Figure 4

Figure 5

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