

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-III • EXAMINATION – SUMMER 2014

Subject Code: 130901

Date: 04-06-2014

Subject Name: Circuits and Networks

Time: 02:30 pm to 05:00 pm

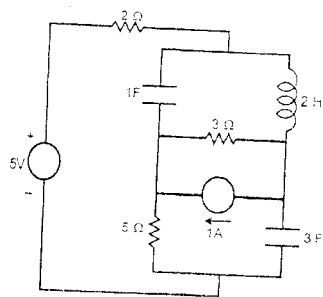
Total Marks: 70

Instructions:

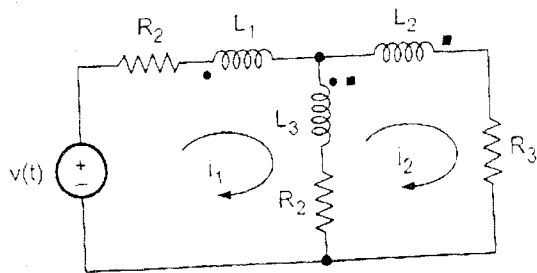
1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Explain the terms (i) Non-Linear (ii) Uni-lateral (iii) Passive (iv) Reciprocal (v) Time variant (vi) Lumped parameter and (vii) principal of Duality. 07
(b) Draw dual Network of given Fig.1 07
- Q.2** (a) Explain the “Dot Convention Rule” for the magnetically coupled Network using network shown in Fig.2. Also write KVL equations. 07
(b) Derive expression of relationship between ‘Y’ parameters and ‘h’ parameters. Discuss Reciprocity and symmetry of network in brief. 07
- OR**
- (b) Explain following in Brief: Ideal and Practical Energy source 07
- Q.3** (a) State and explain Norton’s theorem. 07
(b) Find out current I in 1 ohm resistor given branch for Fig.3 using superposition theorem 07
- OR**
- Q.3** (a) State and explain maximum power theorem with suitable example 07
(b) State and explain compensation and Millman theorem 07
- Q.4** (a) In the network of Fig.4, the switch K closed at $t=0$ Solve for the current $i(t)$ using Laplace transformation method. 07
(b) In the Network shown in Fig.5, the switch k is closed at $t=0$, $V=100$ Volt, $R=1\text{ K}\Omega$, $C=0.5\text{ }\mu\text{F}$, $L=1\text{ H}$ sFind (1) di/dt and (2) d^2i/dt^2 at $t=0+$ 07
- OR**
- Q.4** (a) Find the power supplied by 6 V supply as shown in Fig.-6. 07
(b) Determine the current through 2Ω resistor of Fig.7 using source transformation. 07
- Q.5** (a) State and explain the Initial and final value theorem. 07
(b) What are the procedure for formulation of graph, tree and Incidence Matrix? Hence discuss the procedure of forming reduced Incidence Matrix and its advantages. 07
- OR**
- Q.5** (a) What are the relationship between voltage and current in resistor, inductor and capacitor? Also mention the initial and final condition for R, L and C components in the different cases. 07
(b) Discuss concept of poles and zeros in a network function. 07

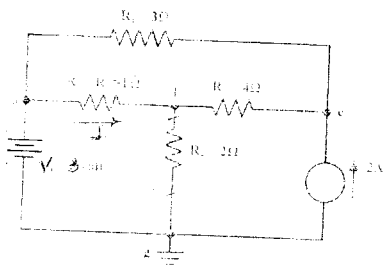
Q-1(B) Fig.1



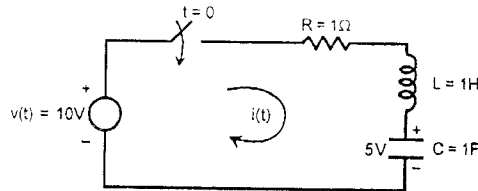
Q-2(a) Fig.2



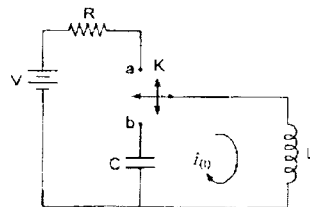
Q-3(B) Fig.3



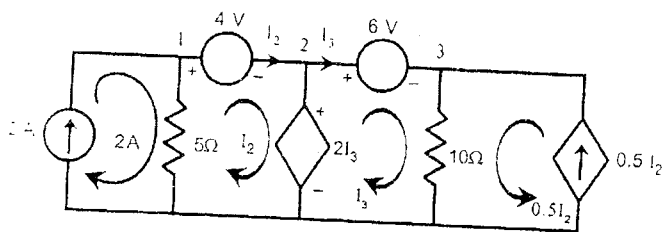
Q-4(A) Fig.4



Q-4(B) Fig.5



Q-4(A) Fig.6



Q-4(B) Fig.7

