Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY
Manipal University

THIRD SEMESTER B.Tech. (E & C) DEGREE END SEMESTER EXAMINATION
December 2015
SUBJECT: NETWORK ANALYSIS (ECE - 203)

TIME: 3 HOURS **MAX. MARKS: 50**

Instructions to candidates
- Answer **ANY FIVE** full questions.
- Missing data may be suitably assumed.
- Do not use **Laplace Transform** unless specified.

1A. Find I_1 in the circuit shown in Fig. Q1A using KCL.
1B. Write the loop equations for the circuit shown in Fig. Q1B.

(5+5)

2A. Find I_0 in the network of Fig. Q2A using Superposition theorem.
2B. Find the equivalent resistance R_{ab} for the circuits shown in Fig. Q2B (a) and (b).

(5+5)

3A. In the circuit shown in Fig. Q 3A, switch K is changed from position a to b at t = 0. Solve for $i, \frac{di}{dt} and \frac{d^2i}{dt^2}$ at t = 0+, if R = 1000 Ω, L = 1H and C = 0.1μF and V = 100V.
3B. The circuit shown in Fig Q 3B, consists of a resistor and a relay with inductance L. The relay is adjusted so that it is actuated when the current through the coil is 0.008 amp. The switch K is closed at t = 0, and it is observed that the relay is actuated when t = 0.1sec. Find: (a) the inductance L of the coil, (b) the equation of i(t) with all the terms evaluated.

(5+5)

4A. Find the particular solution to the differential equation $\frac{d^2i}{dt^2}+3\frac{di}{dt}+2i=10\sin 10t$ for the following initial conditions: i(0+) = 2; $\frac{di}{dt}(0+)=-1$.
4B. In the circuit shown in Fig. Q4B the switch is in position 1 long enough to establish the steady state and is switched to position 2 at t = 0. Find the current i(t) using Laplace transform.

(5+5)

5A. A square wave whose peak-to-peak value is 1V extends ±0.5V with respect to ground. The half period is 0.1 sec. This voltage is impressed upon an RC differentiating circuit whose time constant is 0.2 second. What are the steady state maximum and minimum values of the output voltage?
5B. Find the y parameters of the circuit shown in Fig. Q 5B.

(5+5)

6A. Find V_{ab} in the circuit shown in Fig. Q 6A.
6B. Find the value of the load R_L in the network shown in Fig. Q 6B that will achieve maximum power transfer, and determine the value of the maximum power.

(5+5)

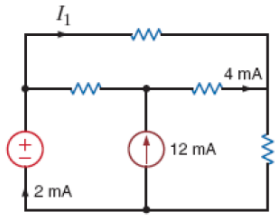

Figure Q1A

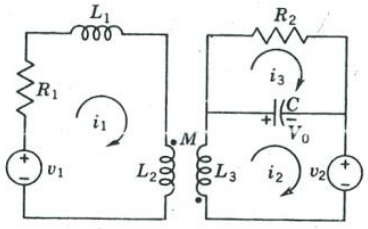

Figure Q1B

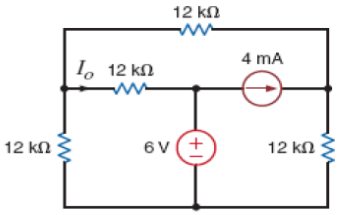

Figure Q2A

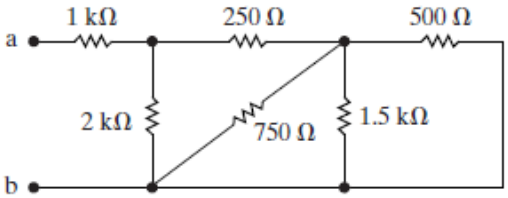

Figure Q2B (a)

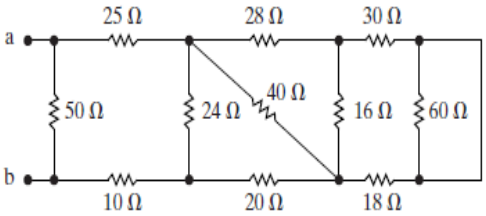

Figure Q2B (b)

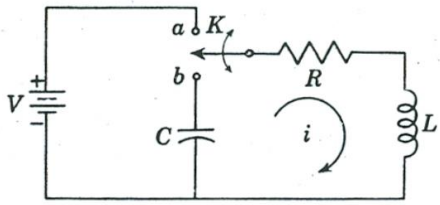

Figure Q 3A

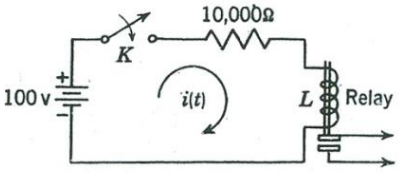

Fig Q 3B

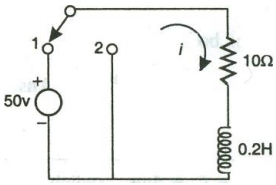

Fig Q4B

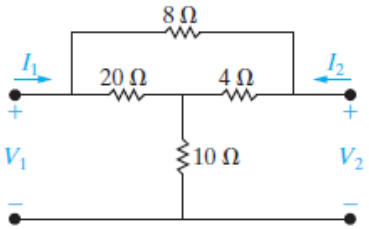

Fig Q 5B

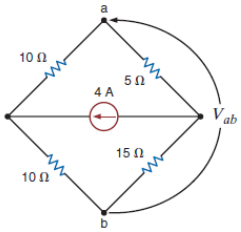

Fig Q 6A

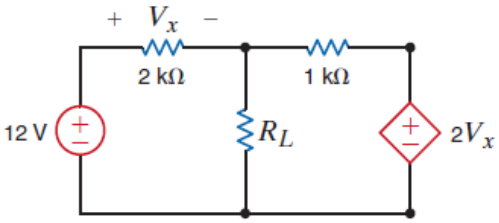

Fig Q 6B