Reg.No										

Manipal Institute of Technology

(Constituent Institute of MAHE – Deemed University)
Manipal – 576 104

THIRD SEMESTER B.E (IT)
END SEMESTER MAKEUP EXAMINATIONS – JANUARY, 2007
SUBJECT: ELECTRICAL AND ELECTRONIC CIRCUITS – (ICT-207)
(REVISED CREDIT SYSTEM)

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

Instructions to Candidates:

- **Answer any 5 FULL questions.**
- **All questions carry equal marks.**
- **Missing data may be suitably assumed.**
- **Standard denotions are used.**

1A. Determine the current I drawn from the battery of 50 V in the Fig. Q1A.
1B. Obtain the equivalence of the inductance L_{eq} between the terminals 1, 2 of Fig. Q1B.
1C. (a) Derive the expressions for the energy stored in an inductance and a capacitance.
(b) Find the current and power dissipated in the 5 Ω resistor in the circuit [Fig.Q1C].

[2+3+5]

2A. Derive the condition for transferring the maximum power from a source to a load.
2B. Determine the current I through the 5 Ω resistor [Fig.Q2B]
2C. (a) State and explain Thevenin's theorem.
(b) Determine the current I in the circuit shown in Fig.Q2C(b).

[2+3+5]

3A. Explain the various properties of a Laplace transformation.
3B. Determine the final value of the current I in a RL circuit for the step input using the final value theorem.

3C. (a) What is a forcing function? Explain.
(b) A mesh network is shown in Fig.Q3C (b). Obtain the expression for $I_1(s)$ and $I_2(s)$ when the switch is closed.

[2+3+5]

4A. What is an instrumentation amplifier? Draw the circuit of a 3 OP-AMP instrumentation amplifier. Derive the expression for its output voltage V_o.

4B. Draw the internal constructional details of a 555 Timer IC. Illustrate how it can be used as;

(a) An astable multivibrator
(b) A mono-stable multivibrator

4C. (a) How the ADCs are classified? Explain.

(b) It is desired to control a fuel level in a tank. Draw the block diagram of the control system and explain its working.

[2+3+5]

5A. Draw the panel and block diagram of a power supply. Explain its working. What are the following regulators?

(a) Shunt
(b) Series voltage

5B. (a) What is an oscillator? How they are classified? What are their applications?

(b) Draw the circuit diagram of an Wien bridge oscilltor. Explain its working. Write down expressions for frequency of oscillations of the output voltage and condition for oscillation.

5C. Explain the following:

(a) Bread board
(b) PCB
(c) Soldering

[2+3+5]

6. Write short notes on any FOUR of the following:

(a) Star delta transformation
(b) Reciprocity theorem
(c) Convolution theorem
(d) Time based circuit
(e) AVO meter

[2.5 X 4]

XXXXXXXXXXXX