



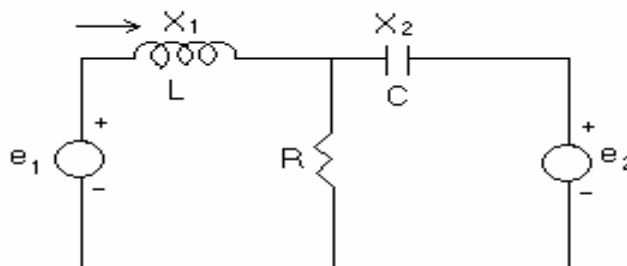
Dept. of Computer Engineering
Second Exam, First Semester: 2006/2007

Course Title: Modeling & Simulation	Date: 9 / 1 / 2007
Course No: (630573)	Time Allowed: 1 Hour
Lecturer: Dr. Mohammed Mahdi	No. of Pages: 1

Question 1:**(7 Marks)**

Objectives: This question is about extracting state-space model.

For the electrical circuit shown below find the state-space model. Then draw the analog simulation computer set-up. What conclusions can you make?

**Question 2:****(7 Marks)**

Objectives: This question is about software simulation.

Write a complete software program that simulates the nonlinear differential equation $\dot{y} = 6x - 0.007y^2$ with:- $Y(0) = 0$, step size = $h = 0.1$, for $0 \leq x \leq 0.5$ by using second order Runge-kutta numerical integration method.

Question 3:**(6 Marks)**

Objectives: This question is about Matlab software package.

Given the following Matlab code, it is required to write a suitable remark on each line, and then estimate the plot of each signal y , $z1$, $z2$, and $z3$.

```
>> x = linspace (0, 2*pi , 30);
>> y = sin ( x );
>> z1 = ( y >= 0 ) . * y;
>> z2 = y + 0.5 * ( y <= 0 );
>> z3 = ( x <= 8 ) . * y;
```

Good Luck