Final Examination: Semester 1   **Academic Year: 2007**

Date : 8 October 2007   **Time : 9:00-12:00**
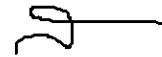
Subject : 215-625 System Modeling and Simulation   **Room : A202**

Instruction

1. **The exam contains 6 problems.**

2. **All documents and calculator are allowed.**

October 3, 2007

1. Discuss techniques in modeling and simulation including physical modeling, and what are the advantages or benefits for each technique.

(20 Marks)

2. Describe steps in mathematical modeling and representing dynamic systems. Starting from the actual system to the final stage of analysis of the performance.
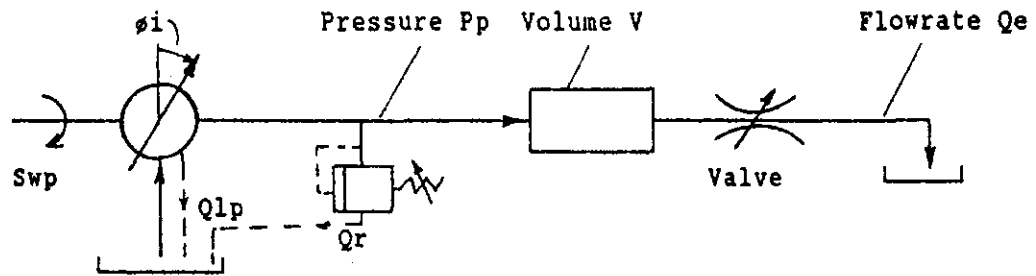
(20 Marks)

3. Classify source code implementation by language used, how many groups can be devided.
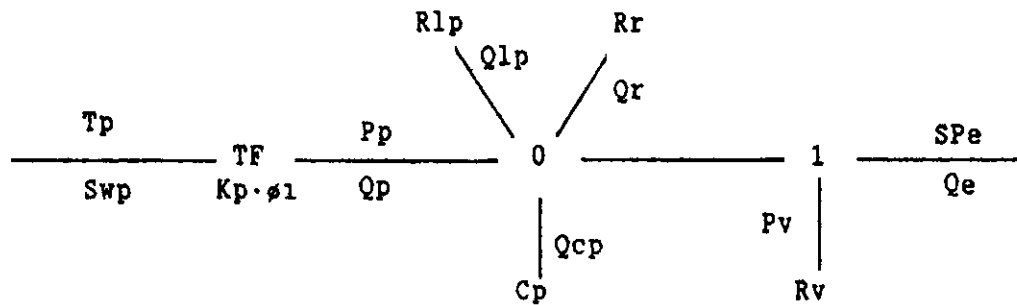
(20 Marks)

4. Complete the following power bond graph model.

(20 Marks)

Pump System:

Power bond graph:

5. Discuss the effect of integration algorithms and step size in digital simulation.

(20 Marks)

6. Describe the meaning of the following source code line by line.

```
METHOD RK4
STARTTIME = 0
STOPTIME = 10
DT = 0.02


init A =100
init B = 0
init C = 0
ka =1
kb =1


d/dt (A) = - ka*A
d/dt (B) =ka*A - kb*B
d/dt (C)  = kb*B
```

(20 Marks)