

Uva Wellassa University, Sri Lanka
End Semester Examination – February 2011
SCT 461-1 Introduction to Mechatronics



Time: One (01) Hour

Total 03 Questions
Answer two (02) questions

1.
 - a. What is a sensor? Name 4 sensors and describe the physical parameters they can measure.
 - b. What is an actuator? Name 4 actuators and give the kind of energy conversion.
 - c. What are the important steps in designing a mechatronic system?
 - d. Draw architecture for a PC based drilling machine using a block diagram.
 - e. Explain how a robotic arm becomes a mechatronic system.

(100 marks)

2.
 - a. How do you define a Petri Net? Draw a simple Petri Net for a known system of your interest and name the diagram. Give the initial conditions.
 - b. What is an IDEF diagram? What are the uses of IDEF diagrams? Draw an IDEF0 diagram for a system you know and name the components.

(100 marks)

3.
 - a. Consider the mechanical system shown in Fig Q3a below. Derive the state space set of equations for this system.

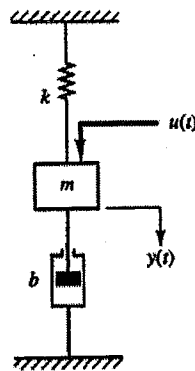


Fig Q3a

- b. Consider the cart shown in Fig Q3b below. Derive the transfer function $Y(S)/U(S)$ for this system.

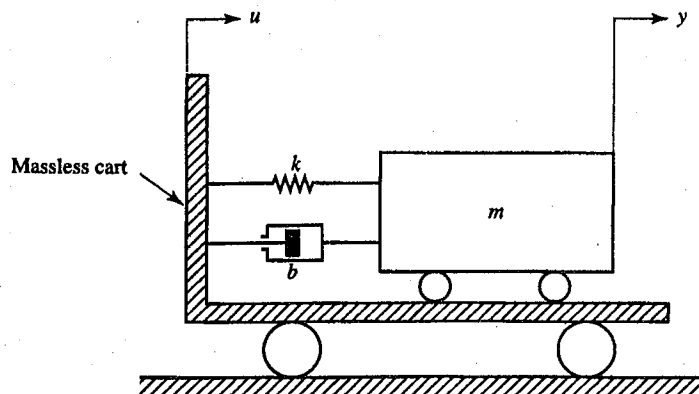


Fig Q3b

(100 marks)