BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE PILANI (RAJASTHAN)
First Semester 2008-2009
AAOC C321 : Control Systems
Tutorial No. 1
Date: 14.08.2008

Q.1 Classify the following systems as linear/non-linear; discrete/continuous; time variant/time invariant:

(a) $y\frac{dy}{dt} + y = \sqrt{x}$ (b) $10\frac{d^2y}{dt^2} + 3t\frac{dy}{dt} + 2y = x$

Q.2.(i) Obtain Laplace Transformation of the following functions:

(a) $1 - e^{-at}$ (b) $e^{-4t}\sin(bt)$

(ii) Obtain Inverse Laplace of the following functions:

(b) $\frac{s+4}{s^2+2s+1}$ (c) $\frac{1}{(s+3)(s+4)}$

Q.3. For the translational systems shown in Fig. 3

(a) Write down the governing differential equations.

(b) Draw the equivalent mechanical network and analogous electrical network using force–current analogy:

(c) Determine the transfer functions $\frac{X_2(s)}{F_2(s)}$

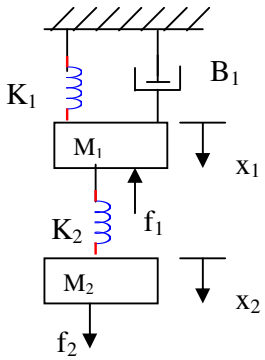

Fig. 3

Q4. Find out the transfer function $\frac{C(s)}{R(s)}$ for the given block diagrams using block diagram reduction techniques.