University of Saskatchewan
Department of Electrical Engineering
EE 214- System Modeling and Network Analysis
Mid-term Examination (This is a CLOSED Book Examination)
February 8, 2006 **Duration: 90 minutes**

1. Consider that a third-order control system has the characterstic equation

$$s^3 + 3408.3s^2 + 1204000s + 1.5\times10^7 K = 0$$

Use the Routh-Hurwitz criterion to determine the range of K for stability.

2. The circuit in Fig. 1 is a voltage-to-current converter. Find the current i_o if $V_I = 8\ V$.

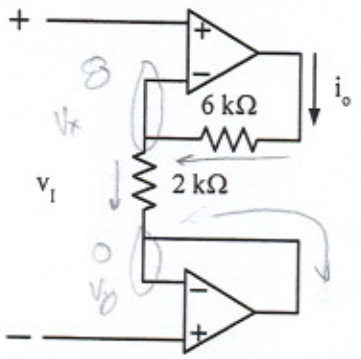

Fig. 1

3. Determine the required value of R so that $V_o = -1.95\ V$ for the circuit of Fig. 2.

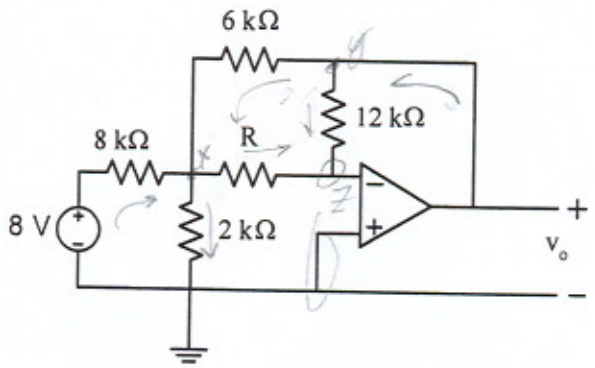

Fig. 2

4. Consider the circuit shown in Fig. 3.

Show that the transfer function can be expressed as:

$$G(s) = \frac{As}{s^2 + Bs + D}$$

Find A, B and D.

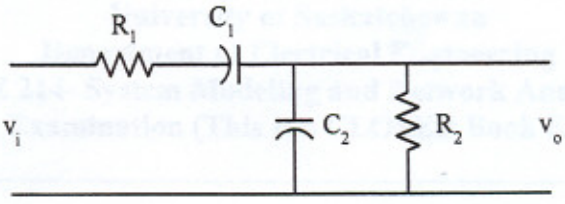

Fig. 3