Homework 6
CM4650 Spring 2016

Due: *Wednesday 11 April 2018, in class*

Please do not write on the back side of the page. Please write legibly and large. Thank you.

1. (10 points) Text 8.1 (What constitutive equations have we studied thus far? What are their pros and cons?)
2. (30 points) Text 8.16 (calc. shear start-up material functions for GLVE)
3. (30 points) In Figure 8.8 on page 284 there is a fit to the Generalized Maxwell model with 10 parameters (five relaxation times).
    a. Plot the shear start-up response $\eta^+(t)$ that is predicted for the fluid in that figure (with the model parameters indicated in the figure). Use Excel, Matlab, or other appropriate software. Use a log-log scale with three decades in each direction (minimum). Please make a good looking graph with correct labels and a figure caption.
    b. What do you predict for the steady shear viscosity of this fluid ($\eta(\dot{\gamma})$)?
4. (30 points) Answer the following (please do not quote the book back to me; put your answer in your own words):
    a. What is the "terminal zone"?
    b. What is the "plateau modulus"?
    c. What is the "relaxation modulus $G(t,\gamma_0)$"?
    d. What is the "zero shear viscosity"?
    e. What is the "glassy region"?
    f. What is a "relaxation time"?