

**Final Exam, May 5—6 questions, total weight is 110%, all sub-questions carry equal weight.**

**1. (15%)** In the simple efficiency wage model where effort depends on the level of unemployment (Romer 9.3) the model predicts that firms will pay above the market clearing wage (for suitable parameter values). Please show the details (including derivations) of this model.

**2. (30%)** Assume that income follows the ARMA process

$$a(L)y_t = 3 + b(L)e_t$$

where  $e_t$  is white noise.

i) Show (i.e., just write it down) the formula for how consumption reacts to an innovation ( $e_t$ ) in income.

ii) An explicit example would be:

$$y_t = 3 - .9y_{t-1} + e_t + e_{t-1} .$$

What would be the change in consumption following a 100\$ innovation to income assuming an interest rate of 10%?

iii) Derive the formula you used in part i).

**3. (20%)** For the case of the 2 countries, 2 periods, 2 states-of-the-world in Obstfeld-Rogoff Chapter 5.2 (where agents can trade using a full set of Arrow securities):

i) State the formula for the rate of interest.

ii) Derive the formula for the rate of interest.

**4. (15%)** Explain the idea of menu costs.

**5. (15%)** Explain (following Romer) why it is not realistic that menu costs explains sticky prices unless labor markets deviate from the standard Walras model. (You can use the simple model in Romer, or you can explain what goes on in words, but in latter case you need to make sure that you are precise and use terms from the course.)

**6. (15%)** State the formula for the return to an asset according to the CAPM model. Be precise about describing all terms in the equation.