

**HANOVER COLLEGE. ECON 214: INTERMEDIATE MACROECONOMIC THEORY  
EXAM 2.**

- Credit will not be given unless you show your work/calculations.
- All answers should be in the blue book. One answer per page ( a,b,c etc. should be on same page, if possible).
- Make sure you label all curves and axis in your graphs.

Total points: 68

**1.** (20 pts). Given the following Solow model:

$Y = 10 * K^{.4} L^{.6}$  where Y is output, K is capital stock and L is labor.

$y = c + s$  where y is per worker output, c and s are consumption and savings per worker

$k_{year 2} = (1-d)k_{year 1} + i_{year 1}$  where k is capital stock per worker, d the depreciation rate and i is investment per worker.

Assume the rate of technological progress and efficiency growth are both zero.

a) Derive the production function per worker. (3 pts).

b) If the rate of depreciation is 10% (0.10), growth in the labor force is 4% (0.04) and the savings rate is 30% (0.30), what are the steady states values for the capital stock per worker, output per worker and consumption per worker? (9 pts).

c) Graphically illustrate the steady state. Also, indicate the level of consumption in the graph. (4 pts).

c) If the savings rate increases, show the effects on consumption and output over time ("time" on the horizontal axis). (4 pts.).

**2.** (6 points). In 2001, GDP per capita was \$31,000 in U.S. and \$21,00 in Spain. Use the Solow growth model and provide two explanations for why GDP per capita is higher in the U.S.. Assume the depreciation rate and the rate of efficiency growth is the same in U.S. and Spain.

**3.** (7 points). Suppose that students at Hanover College (HC) can be classified into 2 groups: (1) Involved in a relationship and (2) not involved. Among involved students, 1% (0.01) experience a breakup of their relationship every month. Among those not involved, 5% (0.05) will enter into a relationship every month.

a) If the number of HC students is 1000, how many students break up every month? (4 pts).

b) If HC wanted to promote relationships and reduce the number of breakups among students, would a fine of \$2,000 on the "breaker-upper" help in this regard? Explain. (3 pts.)

**4.** (14 points).

a) Use the AS/AD model and show the long-run effects on output as a result of higher income taxes (consider the effects on the capital stock and the implications for the long-run AS). (8 pts.)

b) Would the results in (a) differ if you considered the labor "supply-side" effects?

Explain the labor supply side effects and comment on how the changes in private and public savings might be affected (as a result of higher income taxes) and the implications for the changes in capital stock and output (6 pts.).

**5.** (12 points, 4 points each). Consider the following statements and carefully explain if the statements are true, false or if they depend.

a) "A decrease in the money supply will, in the long run, decrease output"

b) "Increasing the dollar amount of unemployment benefits will most likely decrease the natural rate of unemployment".

c) In the Solow growth model, an increase in the savings rate will always increase consumption per worker (in the long run)".

**6.** (9 points). Suppose the U.S. economy is operating at the "full employment" point.

a) How would a reduction in Aggregate Demand impact the economy? What would the effects be on the unemployment rate? Why is that?

b) Explain how the economy would "self correct" itself over time (i.e. explain why the economy would return to "full employment".

c) Can the Federal Reserve (FED) speed up the adjustment in (b)? If so, what should the FED do? Fully explain.