Name _____ Student ID _____

**Mark on your scantron: Test from A**

# Midterm - Economics 101 (Fall 2007)

You will have 75 minutes to complete this exam. There are 62 points.

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**Multiple Choice:** (16 points total, 2 points each) Choose the best answer. Write on your scantron

For questions 1-2, assume the following information for an economy that produces two goods. Use **2006** as your base year.

| | 2006 | 2007 |
|---|---|---|
| beach towels: | | |
| price | $5 | $6 |
| quantity | 3 | 2 |
| suntan lotion: | | |
| price | $3 | $4 |
| quantity | 8 | 10 |

MC#1) The GDP deflator for 2007 is:
a) 40/52.
b) 40/50.
c) 50/39
d) 52/40.
e) 39/50.

MC#2) The CPI for 2007 is:
a) 40/52.
b) 40/50.
c) 50/39
d) 52/40.
e) 39/50.

MC#3) The consumer price index and GDP deflator both
a) have fixed weights.
b) measure the aggregate price level.
c) tend to understate inflation.
d) all of the above.

MC#4) All of the following actions are classified as investment in macroeconomics, except:
a) You buy shares of stock in Intel (a company)
b) Intel builds a new factory in Sacramento.
c) A café buys a new espresso machine.
d) Your uncle buys a new home.

MC#5) According to the neoclassical model, what variable adjusts to make supply equal demand in the goods market:
a) real wage
b) real interest rate
c) real rental rate
d) price level

MC#6) According to the neoclassical model, what variable adjusts to make supply equal demand in the financial market:
a) real wage
b) real interest rate
c) real rental rate
d) price level

MC#7) How can the Solow model explain the trend of growth in output per person observed in U.S. data over the last century?
a) increase in capital stock as the economy converges to steady state
b) population growth
c) technological progress
d) all of the above

MC#8) In the Solow growth model, a rise in the saving rate can lead to which of the following
a) higher growth rate of output per person in the short run
b) lower level of consumption per person in the short run
c) higher level of consumption per person in the long run
d) all of the above

**Problem 1: Neoclassical Model of the Factors Market** (15 points total)

Suppose production in the US economy could be represented by the following Cobb-Douglas production function: $Y = 4K^{1/4}L^{3/4.}$ Suppose the economy has 100 units of capital (K) and a labor force of 100 workers (L).

a) (6 points) Compute the equilibrium values for the following three variables:
- real wage rate,
- real rental rate on capital, and
- total payments to labor in this economy.

b) (3 points) Suppose that there is a wave of immigration of new workers into the country. How will this affect the equilibrium values of the following. (Mark on scantron, no calculations necessary)

MC#9) real wage (a) rise (b) fall (c) no change (d) insufficient information
MC#10) real rental rate (a) rise (b) fall (c) no change (d) insufficient information
MC#11) total payments to labor
(a) rise (b) fall (c) no change (d) insufficient information

c) (3 points) Now suppose that a hurricane destroys some of the capital stock. How will this affect the equilibrium values of the following.

MC#12) real wage (a) rise (b) fall (c) no change (d) insufficient information
MC#13) real rental rate (a) rise (b) fall (c) no change (d) insufficient information
MC#14) total payments to labor
(a) rise (b) fall (c) no change (d) insufficient information

d) (3 points) Does the production function here exhibit constant returns to scale? Does it exhibit diminishing returns to labor? Discuss in a couple sentences whether it is possible for both these properties to co-exist at the same time.

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**Problem 2: Neoclassical Model** (15 points total)

Suppose the real side of the U.S. macroeconomy is characterized as follows:

| | | |
|---|---|---|
| Production: | $Y = 10K + 6L$ | |
| Factor supplies: | $K = 100$ | $L = 100$ |
| Government: | $G = 400$ | $T = 400$ |
| Consumer behavior | $C = 100 + 0.75(Y-T)$ | |
| Investment behavior | $I = 300 - 1000r$ | |

(Y is real GDP, K capital, L labor, G government purchase, T taxes, C consumption, I investment, r real interest rate. Assume a closed economy.)

a) (7 points) Compute the equilibrium levels of the following 7 variables:

| | | |
|---|---|---|
| GDP | real interest rate | investment |
| consumption | private saving | government saving |
| total national saving | | |

b) (4 points) Suppose that the government raises the level of taxes, T. What effect will this have on the variables listed below? Mark the answer on your scantron. No computations necessary. No explanation required.

| | | | | |
|---|---|---|---|---|
| MC#15) national saving | (a) rise | (b) fall | (c) no change | (d) insufficient information |
| MC#16) real interest rate | (a) rise | (b) fall | (c) no change | (d) insufficient information |
| MC#17) investment | (a) rise | (b) fall | (c) no change | (d) insufficient information |
| MC#18) private saving | (a) rise | (b) fall | (c) no change | (d) insufficient information |

c) (4 points) Suppose now instead that the government raises the level of government purchases , G. (Taxes back at their original level.) What effect will this have on the variables listed below? Mark the answer on your scantron. No computations necessary; no explanation required.

| | | | | |
|---|---|---|---|---|
| MC#19) national saving | (a) rise | (b) fall | (c) no change | (d) insufficient information |
| MC#20) real interest rate | (a) rise | (b) fall | (c) no change | (d) insufficient information |
| MC#21) investment | (a) rise | (b) fall | (c) no change | (d) insufficient information |
| MC#22) private saving | (a) rise | (b) fall | (c) no change | (d) insufficient information |

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**Problem 3: Solow Growth Model**: (16 points total)

Suppose an economy can be characterized by the production function: $Y = F(K,L) = K^{0.5}L^{0.5}$. Suppose the depreciation rate is 8%, the saving rate is 20%, the population growth rate is 2%. Assume there is no technological progress.

a) (6 points) Using the Solow growth model, compute the steady state values of the following:
- capital per person
- income per person
- consumption per person

b) (4 points) Define in words what is the golden rule level of capital, and why it is desirable. Compute the golden rule level of capital per person for this economy.

c) (3 points) Suppose the country implements a policy that lowers the population growth rate below the 2% level assumed above. What would happen to the steady state values of the following variables: (write in scantron, no calculations necessary)

| | | | | |
|---|---|---|---|---|
| MC#23) output per person | (a) rise | (b) fall | (c) no change | d) ambiguous |
| MC#24) consumption per person | (a) rise | (b) fall | (c) no change | d) ambiguous |
| MC#25) growth rate in GDP per person | (a) rise | (b) fall | (c) no change | d) ambiguous |

d) (3 points) Use the Solow model to discuss why it might be a bad thing for the U.S. to have a low saving rate. Discuss how, on the other hand, it is also theoretically possible for a country to have a saving rate that is too high.