Multiple Choice: (30 points total, 3 points each) Write answers in your blue book.

1) Suppose Boeing Co. builds an airplane in the U.S. and sells it to Air France. This transaction will have what effect on U.S. national income accounts?
   a) raise investment
   b) raise net exports.
   c) raise GDP.
   d) both b and c.

2) The consumer price index
   a) measures the average price of all goods and services produced in the economy.
   b) includes goods not produced in the country.
   c) tends to understate the level of inflation because of substitution bias.
   d) uses weights that change each year.

3) All of the following actions are classified as investment in macroeconomics, except:
   a) IBM builds a new factory in Sacramento.
   b) Café Roma buys a new espresso machine.
   c) Your parents buy a new home.
   d) You buy 100 shares of IBM stock

4) When you use $5 to buy lunch, you are using money as a:
   a) medium of exchange
   b) store of value
   c) unit of account
   d) flow of value

5) Which of the following could help explain the general rise in natural rate of unemployment in the U.S. over the last 40 years:
   a) information about available jobs is better now.
   b) the degree of unionization is lower.
   c) the industrial sector has declined while the service and high-tech sectors have grown.
   d) we have more recessions than in the past.

6) Which of the following could help lower wait unemployment in France:
   a) Reduced work week (with same salary)
   b) Lower unemployment benefits
   c) New worker retraining programs
   d) A decrease in unionization

7) According to the neoclassical model, when investment demand rises at all interest rates, the equilibrium interest rate _____ and the equilibrium level of investment ______.
   (Assume consumption is just a function of disposable income alone.)
   a) falls, does not change
   b) falls, rises
   c) rises, does not change
   d) rises, rises

8) Assume now a consumption function that says the level of consumption falls when the interest rate rises. Now according to the neoclassical model, when investment demand rises at all interest rates, the equilibrium interest rate _____ and the equilibrium level of investment ______.
   a) falls, does not change
   b) falls, rises
   c) rises, does not change
   d) rises, rises

9) If factor markets are competitive and firms maximize profits using a production function with constant returns to scale, then a rise in labor supply:
   a) raises the real rental rate on capital.
   b) raises the real wage.
   c) raises economic profits.
   d) both a and c.

10) Which of the following is implied by the quantity theory of money:
    a) When the government raises the money supply, velocity rises in proportion.
    b) If the rate of money growth equals the rate of growth in total GDP, then inflation will be exactly zero.
    c) If the supply of output doubles in the economy and the money supply is fixed, the price level will double.
    d) both b and c.
**Problem 1:** (40 points total, 10 points each part)

Suppose the supply side of the U.S. goods market can be characterized as follows:

\[ Y = 6K^{1/2}L^{1/2} \]  
\[ K = 100 \quad L = 100 \]

Suppose the demand side can be characterized by the following:

\[ G = 100 \quad T = 100 \]
\[ C = 100 + 0.6(Y-T) \]
\[ I = 200 - 1000r \]

a) Compute the equilibrium real interest rate, investment, consumption, private saving, and the real wage.

b) Congressional Republicans wish to consider cutting taxes. Discuss what effects this fiscal policy would have on the economy above. In particular, state for each of the variables you computed in part (a) whether it will rise, fall, not change, or if it is impossible to tell. (No calculations required.)

c) Suppose the Congressional Republicans do not wish to generate a budget deficit by cutting taxes, so they propose to cut government spending and taxes by the same amount. Now state for each of the variables you computed in part (a) whether it will rise, fall, not change, or if it is impossible to tell.

d) Now suppose a completely different experiment. The U.S. has been experiencing a wave of immigration that is increasing its supply of labor beyond that specified above. Use the Neoclassical model above to analyze the effects of this on the rest of the economy. In particular, state for each of the variables you computed in part (a) whether it will rise, fall, not change, or if it is impossible to tell. (Note: there is no change in fiscal policy here.)

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**Problem 2: Convergence** (20 points total, 5 points each)

Although the U.S. and Mexico share a large common border, their economies are very different. Most prominent is the fact that Mexico has a lower level of income per person than the U.S.

a) Use the growth theories studied in class to discuss the prospects for Convergence between the U.S. and Mexico. In particular, state whether the level of income per person in Mexico in the long run will be higher than in the U.S., lower, or the same, or if it is impossible to tell. (Assume unless stated otherwise that the underlying features of the two economies are the same: same saving rate, depreciation rate, Cobb-Douglas production function, population growth rate, with no technological progress.)

b) Now reanswer the question in part (a) if you know that Mexico has a higher population growth rate.

c) Now reanswer the question in part (a) if you know instead that Mexico has a higher rate of technological progress (as defined in class). (Same population growth rates again.) Discuss your reasoning briefly.

d) Now reanswer the question in part (a) if instead both countries have production functions with constant returns to capital and no labor (ie. \( Y = AK \)). (Same population growth rates again and no technological progress.) Discuss your reasoning briefly.

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**Problem 3: Solow Growth Theory** (30 points total, 10 points each part)

Suppose that a country has the following production function \( y = 10k^{1/2} \) (in per worker terms). Suppose also that the saving rate is 30 percent, the depreciation rate is 8 percent, and the population growth rate is 2 percent (with no technological progress).

a) Compute the steady state level of capital stock and consumption per person.

b) If you were a policy maker and you wanted this country to enjoy the highest level of consumption per person that was possible, what saving rate would you try to achieve? Discuss briefly what things the government can do to help the economy achieve this saving rate.

c) Assume you achieve this saving rate and you reach the steady state with the maximum level of consumption per person. Will the following variables be higher than under the saving rate from part (a), lower, the same, or is it impossible to tell: the real wage, real rental rate on capital, the share of total income paid to workers, and the share of total income paid to the owners of capital? Discuss
briefly the distributional implications of this policy: which parts of the population benefit more than others from this public policy?