You have 50 minutes to complete the 100 points worth exam. Make sure you show all your work so you can get partial credit. If you get stuck in a problem, make an assumption (reasonable), indicate it clearly, and continue with the problem. Before beginning the exam, please verify that you have 6 pages with 22 questions in your exam booklet. Good luck!

Multiple Choice (each 3 points)

1. The value of net exports is also the value of:
   a. net investment.
   b. net saving.
   c. national saving.
   d. the excess of national saving over domestic investment.
   e. foreign investment

2. According to the theory of liquidity preference, the supply of nominal money balances:
   a. is chosen by the central bank.
   b. depends on the interest rate.
   c. varies with the price level.
   d. changes as the level of income changes.
   e. depends on money demand.

3. If a U.S. corporation purchases a product made in Europe and the European producer uses the proceeds to purchase a U.S. government bond, then U.S. net exports ______ and net capital outflows ______.
   a. increase; increase
   b. increase; decrease
   c. decrease; increase
   d. decrease; decrease
   e. decrease; could either increase or decrease

4. Which of the following factors in the Solow model can lead to sustained increases in the standard of living?
   a. increase in the stock of capital
   b. decrease in the population growth rate
   c. increase in the rate of saving
   d. decrease in the rate of depreciation
   e. increase in total factor productivity

5. An increase in the trade surplus of a small open economy could be the result of:
   a. a domestic tax cut.
   b. an increase in the world interest rate.
   c. an increase in government spending.
   d. a decrease in government spending abroad by a large open economy.
   e. the implementation of an investment tax-credit provision.
6. Based on a Cobb-Douglas production function and perfect capital mobility, capital should flow to economies where:
   a. capital is relatively scarce.
   b. capital is relatively abundant.
   c. technological production capabilities are inferior.
   d. labor is relatively scarce.
   e. none of the above

7. Protectionist policies in a small open economy do not alter the trade balance because the:
   a. quantity of imports and exports is fixed.
   b. interest rate adjusts to offset any reductions in imports.
   c. exchange rate appreciates to offset the increase in net exports.
   d. level of net capital outflow is fixed by the world interest rate.
   e. the real exchange rate is always set according to PPP

8. If the real exchange rate between the United States and Japan remains unchanged, and the inflation rate in the United States is 6 percent and the inflation rate in Japan is 3 percent, the:
   a. dollar will appreciate by 3 percent against the yen.
   b. yen will appreciate by 3 percent against the dollar.
   c. yen will appreciate by 6 percent against the dollar.
   d. yen will appreciate by 9 percent against the dollar.
   e. dollar will appreciate by 6 percent against the yen.

9. The index of leading indicators compiled by the Conference Board includes 10 data series that are used to forecast economic activity about ______ in advance.
   a. one month
   b. one to three months
   c. six to nine months
   d. one to two years
   e. five to ten years

10. In the Keynesian-cross model, as the interest rate increases, the equilibrium level of income ______, whereas in the loanable funds model, as the level of income increases, the equilibrium level of the interest rate ______.
    a. increases; increases
    b. increases; decreases
    c. decreases; decreases
    d. decreases; could either increase or decrease
    e. decreases; increases

11. When Paul Volcker tightened the money supply:
    a. the inflation rate immediately fell.
    b. nominal interest rates fell in the short run.
    c. nominal interest rates fell in the long run.
    d. real balances rose in the short run.
    e. the inflation rate initially increased.
12. Analysis of population growth around the world concludes that countries with high population growth tend to:
   a. have high income per worker.
   b. have a lower level of income per worker than other parts of the world.
   c. have the same standard of living as other parts of the world.
   d. tend to be the high-income-producing nations of the world.
   e. be richer than other parts of the world.

13. Over the business cycle, changes in consumption ______ changes in GDP.
   a. are inversely correlated with
   b. are more volatile than
   c. have about the same volatility as
   d. are less volatile than
   e. can be either more or less volatile than

14. Assume that a war reduces a country's labor force but does not directly affect its capital stock. If the economy was in a steady state before the war and the saving rate does not change after the war, then, over time, capital per worker will ______ and output per worker will grow ______ than it did before the war.
   a. decline; more slowly
   b. decline; faster
   c. increase; faster
   d. increase; more slowly
   e. remain the same; more slowly

15. In the Keynesian-cross model, if taxes are reduced by 250, then the equilibrium level of income:
   a. increases by 250.
   b. increases by more than 250.
   c. decreases by 250.
   d. increases, but by less than 250.
   e. decreases, but by less than 250.

16. If the marginal propensity to consume is 0.6, then the government purchases multiplier in the Keynesian-cross model equals:
   a. 0.6
   b. 1
   c. 1.6
   d. 2.5
   e. 5
Short Answers

17. **Saving** *(9 points)* Suppose that Austria and Belgium are exactly alike in every respect except that the citizens of Austria have a higher saving rate than the citizens of Belgium.
   a. Which country will have the higher level of output per worker in the steady state? Illustrate graphically.

   ![Graph showing saving and output per worker](image)

   b. Which country will have the faster rate of growth of output per worker in the steady state?

18. **Solow Model and Income Differences** *(8 points)* Use the graph below to explain what are the reasons China is well below the US income per capita (about 16-18%).

![Graph showing output per person vs. capital per person](image)
19. **Government Spending** *(8 points)* For a given interest rate, show in a graph the impact of a decrease in government expenditure on the IS curve. When graphing, assume that the real interest rate, and consequently the level of planned investment, does not change.

20. **Living Standards** *(9 points)* List and explain three policies that could lead to higher living standards. Be specific about what you would do to increase living standards in a country rather than simply saying that population growth should decrease.
21. **Keynesian Cross** *(8 points)* Ecuador and Colombia can each be described by a Keynesian-cross model. The *MPC* is 0.9 in each country. Ecuador decides to increase spending by $2 billion, while Colombia decides to cut taxes by $2 billion. In which country will the new equilibrium level of income be greater? Explain.

22. **Policy and a small-open economy** *(10 points)* In April 1995, Michel Camdessus, managing director of the International Monetary Fund (IMF), criticized U.S. economic policy for allowing the dollar exchange rate to fall too low. He recommended that the United States reduce its budget deficit in order to raise the exchange rate.

   a. Use the long-run model of a small open economy to illustrate graphically the impact of reducing the government's budget deficit on the exchange rate and the trade balance.

   ![Graph](image)

   b. Based on your graphical analysis, explain whether Mr. Camdessus's policy recommendation will work. Specifically state what happens to the exchange rate and the trade balance as a result of the government budget deficit reduction.

**Extra Credit**
If you have not missed more than one class since the beginning of the semester, you can answer the question below and earn 3 points extra credit.

23. Short-run fluctuations in output and employment are called:
   a. sectoral shifts.
   b. the classical dichotomy.
   c. business cycles.
   d. productivity slowdowns.
   e. liquidity crises.
Key

1. D
2. A
3. D
4. E
5. B
6. A
7. C
8. B
9. C
10. E
11. C
12. B
13. D
14. A
15. B
16. D

17. a Austria will have the higher level of output per worker.

17. b In the steady state the growth rate of output per work will be zero in both Austria and Belgium.

18. When we look at the equation for income per person it is \( y = Ak^\alpha \). Hence, differences in the standard of living could come from either differences in total factor productivity (\( A \)) or difference in the level of capital per worker (\( k \)). When we compare China to the US, we see that the US has both a higher level of total factor productivity and a higher level of capital per worker. The graph shows that even if China has the US level of productivity, it would still be at about 50% of income per person in the US.

19. The initial equilibrium value of income (output) is \( Y_1 \), with the value of \( Y_1 = E_1 = C + I + G_1 \). When government expenditure decreases by \( \Delta G \), the equilibrium value of income decreases to \( Y_2 = E_2 = C + I + G_2 \). Notice, however, that a decrease in income is greater than a decrease in government expenditure due to the government-purchases multiplier. Since the interest rate is not changing, we are still at \( r \) and consequently, the IS curve shifts to the left by the amount \( \Delta Y \).
20. There are numerous policies that could lead to higher living standards (check the lecture notes on Growth).

- Policies to increase the saving rate
  - Increase private saving: tax breaks or incentives to save such as reducing capital gains tax, corporate income tax, estate tax as they discourage saving. Replacing federal income tax with a consumption tax. Expanding tax incentives for IRAs (individual retirement accounts) and other retirement savings accounts
  - Increase public saving: reducing government budget deficit
- Improving infrastructure
  - This is an increase in publically held capital
- Building human capital
  - educational policies, worker training, health programs, etc. Encouraging entrepreneurial activity – removing red tape
- Encouraging research and development
- Encouraging foreign direct investment (FDI)
- Building better institutions: Corruption free environment, encourage competition
  - Property rights
  - The rule of law
  - Contract enforcement
- Allocation of capital (misallocation)
• investing in “wrong” industries

21. Income in Ecuador will increase more. The government-spending multiplier in Ecuador equals 10, so income in Ecuador will increase by $20 billion. The tax multiplier in Colombia equals 9, so income in Colombia B will only increase by $18 billion.

22.22.a. If the budget deficit is reduced, then the following happens

22.22.b. Mr. Camdessus’s policy will not have the intended effect. The dollar exchange rate will decline and the trade balance will move toward surplus.

23. C