Before beginning the exam, please verify that you have 10 pages with 26 questions in your exam booklet. The exam is worth 100 points. Good luck.

Multiple Choice (each 3 points)
Identify the letter of the choice that best completes the statement or answers the question.

1. 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.

2. The vertical long-run aggregate supply curve satisfies the classical dichotomy because the natural rate of output does not depend on:
   a. the labor supply.
   b. the supply of capital.
   c. the money supply.
   d. technology.
   e. institutions.

3. The price level decreases and output increases in the transition from the short run to the long run when the short-run equilibrium is ______ the natural rate of output in the short run.
   a. above
   b. below
   c. equal to
   d. either above or below
   e. far above

4. In the IS-LM model when taxation increases, in short-run equilibrium, in the usual case, the interest rate ______ and output ______.
   a. rises; falls
   b. rises; rises
   c. falls; rises
   d. falls; falls
   e. falls; could rise or fall

5. Which of the following is an example of a demand shock?
   a. the introduction and greater availability of credit cards
   b. a large oil-price increase
   c. a drought that destroys agricultural crops
   d. unions obtaining a substantial wage increase
   e. an increase in the minimum wage
6. Assume that the economy begins in long-run equilibrium. Then the Fed reduces the money supply. In the short run _____, whereas in the long run, prices _____ and output returns to its original level.
   a. output decreases and prices are unchanged; rise
   b. output decreases and prices are unchanged; fall
   c. output decreases and prices increase; fall
   d. output and prices both decrease; rise
   e. output and prices both decrease; fall

7. Most economists believe that prices are:
   a. not dependent on time.
   b. flexible in the short run but many are sticky in the long run.
   c. sticky in both the short and long runs.
   d. flexible in both the short and long runs.
   e. flexible in the long run but many are sticky in the short run.

8. All of the following were observed during the Great Depression of the 1930s in the United States except:
   a. stock prices declined significantly.
   b. banks ran into trouble.
   c. the unemployment rate soared to 15 percent.
   d. interest rates fell to extremely low levels.
   e. prices fell.

9. If policymakers announce in advance how policy will respond to various situations and commit themselves to following through on this announcement, this is:
   a. policy by rule.
   b. policy by discretion.
   c. time inconsistent policy.
   d. monetary policy.
   e. an automatic stabilizer

10. In the mid-1980s, oil prices _____, inflation was _____, and the unemployment rate _____.
    a. rose rapidly; high; rose
    b. rose slowly; moderate; was high
    c. fell; low; rose
    d. rose rapidly; high; fell
    e. fell; low; declined

11. According to the Solow growth model, large populations:
    a. place great strains on an economy's productive resources, resulting in perpetual poverty.
    b. are a prerequisite for technological advance and higher living standards.
    c. are not a factor in determining living standards.
    d. require the capital stock to be spread thinly, thereby reducing living standards.
    e. require higher capital and output in order to compensate for depreciation.
12. Which of the following is the best example of structural unemployment?
   a. Fatima lost her job at a packing plant, but has not looked very intensively for a new job because she still has two months of unemployment insurance benefits left.
   b. Vickie lost her job as a graphic artist at a movie studio because she did not have training in computer-generated animation.
   c. Tim is looking for a job with flexible hours, but has not been offered one yet.
   d. Mark lost a job in coal mining as demand for coal decreased due to a changing structure of the economy and a switch from fossil fuels to renewable sources of energy.
   e. Kirby is seeking a job as an airline pilot, but the high union wages in the industry have limited the number of jobs available.

13. John Taylor's rule for setting the federal funds rate proposes increasing the nominal federal funds rate as inflation _____ and the GDP gap \[ \frac{100 \times (\bar{Y} - Y)}{Y} \] _______.
   a. decreases; increases
   b. increases; decreases
   c. increases; increases
   d. decreases; decreases
   e. increases; either stays constant or decreases

14. If Congress passed a tax increase at the request of the president to reduce the budget deficit, but the Fed held the money supply constant, then the two policies together would generally lead to ______ income and a(n) ______ interest rate.
   a. lower; lower
   b. lower; higher
   c. no change in; lower
   d. no change in; higher
   e. lower; ambiguous change in

15. If two economies are identical (including having the population growth rates and the rate of depreciation), but one economy has a higher saving rate, then the steady-state level of income per worker in the economy with the lower rate of saving:
   a. will be at a higher level than the steady state of the high saving rate economy.
   b. will be at the same level as the steady state of the high saving rate economy.
   c. will be equal to the ratio of the saving rates in the two economies.
   d. will be at a lower level than the steady state of the high saving rate economy.
   e. impossible to tell without knowing differences in the saving rates in two countries.

16. Who was the Chairwoman/Chairman of the Fed during the Financial Crisis of 2008?
   a. Henry Paulson
   b. Tim Geithner
   c. Ben Bernanke
   d. Janet Yellen
   e. Alan Greenspan
17. Who was the largest issuer of credit default swaps before the Financial Crisis of 2008?
   a. Lehman Brothers
   b. Goldman Sachs
   c. the Fed
   d. the US Treasury
   e. AIG

Short Answers

18. **The Great Recession of 2008-10 (10 points)** Use the IS-LM diagram to explain the events associated with the current recession in the United States. Make sure you include both the initial shock(s) and policy response(s). **Explain the events in words.**
19. **IS-LM and AD-AS in the Long run** *(11 points)* Suppose that the United States enters a major war and consequently expands government spending. Assume that the United States is a closed economy that was at the full employment output before the increase in government spending.

   a. Use the IS-LM model **below** to illustrate graphically how income and interest rates change in response to the increased government spending in the **short-run**. Does income increase/decrease/remain unchanged? How about interest rates? *(Label the initial equilibrium A and the new short-run equilibrium B)*

   b. What happens to aggregate demand as a consequence of the increase in government spending? Show on the AD-AS graph **below** how the economy moves from the initial equilibrium to the short-run equilibrium after the increase. *(Label the initial equilibrium A and the new short-run equilibrium B)*

   c. Use the AD-AS graph from part (b) to show the how the economy moves from the short-run equilibrium to the long-run equilibrium when prices are allowed to adjust. What happens to income and prices? How about interest rates? *(Label the short-run equilibrium B and the new long-run equilibrium C)*
d. Show graphically how income, interest rates, and prices evolve over time as a consequence of the increase in government spending.
e. If, however, policymakers so not want to wait for the economy to adjust after the increase in demand shock and want to bring income and interest rates back to the original levels right away, what type of a policy could they employ?

20. Policy and a small-open economy (10 points)

Above are long-run graphs of exchange rates and net exports in Vietnam, a small open economy. Match policies below with the above graphs.

_____ 1. Vietnam imposes tariffs on importation of foreign steel.

_____ 2. A new technology becomes available to Vietnamese businesses and they decide to adopt it aggressively.

_____ 3. Vietnamese government decreases its budget deficit.

_____ 4. Vietnamese government passes a law which decreases the tax rate on investment in Vietnam.

_____ 5. US, a large open economy, reduces its budget deficit.
Choose one of the following two questions (6 points):

21. **Inflation** (6 points) Consider two countries, Poland and Hungary. In Poland new arrangements for making payments, such as credit cards and ATMs, have been enthusiastically adopted by the population thereby reducing the proportion of income that is held as real money balances. Over this period no such changes occurred in Hungary. If the rate of money growth and the growth rate of real GDP were the same in Poland and Hungary over this period, then how would the rate of inflation differ between the two countries? Carefully explain your answer.

22. **Fiscal and Monetary Policy** (6 points) Two identical countries, Chile and Peru, can be described by the IS-LM model in the short run. The governments of both countries increase government spending by the same amount. The Central Bank of Chile follows a policy of holding a constant money supply. The Central Bank of Peru follows a policy of holding a constant interest rate. Compare the impact of the increase in government spending on income and interest rates in the two countries.
Choose one of the following two questions (6 points):

23. **Policy and a small-open economy (6 points)** Suppose a new technology is developed that increases investment demand in both a closed economy and in a small open economy that are in other ways identical. Holding other factors constant, will the quantity of investment spending increase more in the closed economy or in the small open economy? Explain. Assume prices are flexible and that factors of production are fully employed in both economies. Assume there is perfect capital mobility for the small open economy.

24. **IS-LM Equilibrium (6 points)** Use the IS-LM model to illustrate graphically the impact on output and interest rates of a one-time increase in the price level due to a large increase in oil prices. Be sure to label: i. the axes; ii. the curves; iii. the initial equilibrium values; iv. the direction the curves shift; and v. the terminal equilibrium values.
Choose one of the following two questions (6 points):

25. **Solow Model** (6 points) Suppose that Zimbabwe (Z) and Hungary (D) are exactly alike in every respect except that the rate of saving is higher in Hungary than in Zimbabwe. Which country will have the higher level of output per worker in the steady state? Illustrate graphically.

26. **Unemployment** (6 points) Changes in economic policies will frequently have an impact on the unemployment rate. Explain whether each of the policy changes described is likely to: 1) affect frictional or structural unemployment and 2) increase or decrease the measured unemployment rate.
   a. The government reduces the number of weeks of unemployment insurance that unemployed workers can receive.
   b. The government raises the minimum wage.
   c. The government increases spending on job-training programs.

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

27. Currently, the rate of unemployment in the United States is:
   a. 7.2%  
   b. 2.1%  
   c. 10.1%  
   d. 4.1%  
   e. 0%
18. Shocks:

Demand: fall in housing prices, decline in the stock market, fall in both consumer and producer confidence \(\rightarrow\) shift of the IS curve to the left.

Supply: an increase in the price of oil and a decrease in bank lending \(\rightarrow\) shift of the LM curve to the left (decreased lending leads to lower M and higher oil prices lead to higher P, which means that \(\frac{M}{P}\) decreases).

The effect of both of these shocks was a decrease in total income (output).

Monetary response was a large increase in the money supply and a cut in the discount rate, which both pushed the LM curve back right. Moreover, the Fed started a process of quantitative easing where it was buying securities from and lending directly to investment banks and firms.

Fiscal response included tax cuts both for households and businesses and a dramatic increase in government spending, both of which pushed the IS curve to the right.
19.a. An increase in government spending is a positive increase in demand. This shifts the IS curve to the right (1). Consequently, income increases from $Y_1$ to $Y_2$ and the interest rates increase from $r_1$ to $r_2$. The country finds itself at point B in the short-run.
19.b. As the IS curve shifts to the right, the AD curve shifts to the right as well (2). Since the price is fixed in the short-run, the price level remains at $P_1$. The economy moves from point A to point B.

19.c. The economy finds itself in the short-run equilibrium above the natural rate of output: $Y_2 > Y_1$ (point B). Because aggregate demand is higher than the long-run aggregate supply at the price level $P_1$, there will be an upward pressure on the price level. Over time, prices can change and they adjust. Therefore, prices rise over time and eventually reach level $P_2$. At that point, the economy is in the long-run equilibrium (point C). Income decreases from $Y_2$ to $Y_1$ and prices increase from $P_1$ to $P_2$. Since prices increase, the supply of real money balances decreases ($\downarrow M/P$) and the LM curve shifts left (3). Consequently, interest rates increase and come back to their original level.

19.d. The increase in government spending has real effects in the long-run. Output returns to the natural rate of output in the long-run. Interest rates and prices remain permanently higher as a consequence of the increase in demand.
19. e. Policymakers would employ a contractionary fiscal policy, such as either an increase in taxes or a decrease in government spending. This would push the IS curve back and bring both income and interest rates to the same level as before the increase in demand. If, however, they pursued a contractionary monetary policy, income would decrease, but interest rates would actually increase.


21. The rate of inflation would be higher in Poland. There are two ways one can explain this. 1) Since money demand decreases in Poland, supply of real money balances (M/P) needs to decrease as well (or, better say, growth rates of money demand and money supply need to be the same). To lower (or reduce growth of) M/P, P needs to increase. Since Poland and Hungary are the same in every other way, P will grow faster in Poland. 2) According to the quantity theory, if the rates of money growth and real GDP growth are the same, differences in rates of inflation are related to differences in velocity. The faster increase in velocity leads to a higher rate of inflation, holding other factors constant. In Poland the reduction in the proportion of income held as real balances is the equivalent of a speedup in the rate of velocity and, consequently, a higher rate of inflation in Poland than in Hungary.

22. The interest rate will increase in Chile, but remain constant in Peru. The increase in output will be larger in Peru because the Central Bank of Peru will increase the money supply to keep the interest rate constant in the face of increased government spending. Thus, there will be no crowding out of investment in Peru, but there will be crowding out in Chile because of the higher interest rate.
23. Investment spending will not change in the closed economy, but will increase in the small open economy. In the closed economy, there is no change in domestic saving, so the domestic interest rate must rise to keep investment spending equal to the unchanged domestic saving. In the small open economy, the increase in investment demand is financed by net capital inflows (a decrease in net capital outflows) at the unchanged world interest rate. The decrease in net capital outflows raises the real exchange rate and reduces net exports in the small open economy.

24.

25.
2626.a. Frictional unemployment is likely to be reduced as unemployed workers take fewer weeks to search for new jobs because of reduced benefits. This process is likely to reduce the measured unemployment rate.

2626.b. Structural unemployment will probably increase for those workers with marginal product valued below the higher minimum wage. This policy change is likely to increase the measured unemployment rate.

2626.c. Frictional unemployment will be reduced if workers with obsolete skills receive training that prepares them for available jobs. This policy change is intended to reduce the measured rate of unemployment.

27. D