INSTRUCTIONS:

1) The final is worth 120 points in total: 60 points for the multiple choice questions (Part A), and 60 points for the analytical problems (Part B).

2) **Write your answers for part A (the multiple choice section) in the blanks below.** You won’t get credit for circled answers in the multiple choice section. There is no penalty to guessing, so be sure to answer all of them.

3) **Place all of your answers for part B in the space provided.**

4) Calculators are permitted. Books, notes, reference materials, etc. are prohibited.

5) You must leave your answer sheet stapled to your questions. Do not pull the exam apart. Each student must turn in the entire exam stapled together and will not receive credit if any pages are missing.

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**PART A – MULTIPLE CHOICE QUESTIONS**

Answer multiple choice questions in the space provided below. **PLEASE USE CAPITAL LETTERS.**

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PART A – MULTIPLE CHOICE QUESTIONS

1. Real GDP is nominal GDP adjusted for:
   A) double counting.
   B) changes in prices.
   C) population.
   D) imports.

2. What do a rubbernecking traffic jam and the paradox of thrift have in common?
   A) In both cases, individual behavior has large negative consequences for the whole
      of society.
   B) In both cases, seemingly bad behavior ends up harming everyone.
   C) In both cases, seemingly careless behavior leads to good times for all.
   D) In both cases, government intervention can only make matters worse.

3. Every year more and more purchases are made with credit cards on the Internet. Given
   this trend, all else equal, we would expect:
   A) the money demand curve to shift outward.
   B) the money demand curve to shift inward.
   C) a downward movement along a fixed money demand curve.
   D) an upward movement along a fixed money demand curve.

4. The course packet and the class lecture contrasted __________ historical growth in real
   GDP per capita in the US compared to Argentina to __________.
   A) slower; Argentina does not have such severely cold winter weather
   B) faster; Argentina has a tropical climate with poor soil and tropical diseases
   C) slower; Argentina “robber barons” owned all the land in the US
   D) faster; the US encouraged land ownership by new immigrants but in Argentina
      Spanish colonists had large land holdings

5. Sam, who is 55 years old and has been a steelworker for 30 years, is unemployed
   because the steel plant in his town closed and moved to Mexico. Sam is experiencing:
   A) cyclical unemployment.
   B) permanent unemployment.
   C) frictional unemployment.
   D) structural unemployment.

6. Planned investment spending is:
   A) actual investment in a period.
   B) investment spending minus depreciation in a period.
   C) investment spending that businesses plan to undertake during a period.
   D) always equal to saving.
7. The marginal propensity to consume is:
   A) increasing if the marginal propensity to save is increasing.
   B) the proportion of total disposable income that the average family consumes.
   C) the change in consumer spending divided by the change in aggregate disposable income.
   D) the change in consumer spending minus the change in aggregate disposable income.

8. As a result of a decrease in the value of the dollar in relation to other currencies, American imports decrease and exports increase. Consequently, there is a(n):
   A) increase in short-run aggregate supply.
   B) decrease in the quantity of aggregate output supplied in the short run.
   C) increase in aggregate demand.
   D) decrease in the quantity of aggregate output demanded.

9. The money demand curve is:
   A) downward-sloping because the opportunity cost of holding money is inversely related to the interest rate.
   B) downward-sloping because the opportunity cost of holding money rises as the interest rate rises.
   C) downward-sloping because the opportunity cost of holding money rises as the interest rate falls.
   D) upward-sloping because the opportunity cost of holding money rises with the interest rate.

10. If technology advances, then:
    A) more output can be obtained from the same inputs.
    B) more inputs are needed to produce the same output.
    C) less output can be obtained from the same inputs.
    D) less output can be produced even with more inputs.

11. A course packet reading discussed in class attributed the slower adoption of smart cards for transactions in the US compared to rapid adoption in Europe to:
    A) Telephone calls were much more expensive in Europe in the 1980s
    B) Telephone calls were much less expensive in Europe in the 1980s
    C) Europeans have adopted new inventions of the electronic age faster than Americans
    D) Europeans have adopted new inventions of the electronic age slower than Americans

12. Long-run economic growth has been mostly dependent on:
    A) rising productivity.
    B) a low unemployment rate.
    C) an increase in the population which eventually leads to an increase in the labor population.
    D) countries following the rule of 70.
13. Rising inventories usually indicate:
   A) an economy that grows unexpectedly.
   B) an economy that slows unexpectedly.
   C) an unexpected spurt in sales.
   D) an inflationary cycle.

14. Banks create money when they:
   A) make loans.
   B) take deposits.
   C) hold excess reserves.
   D) pay withdrawals to depositors.

15. An example of the frictionally unemployed is a(n):
   A) autoworker who is temporarily laid off because of a decline in sales.
   B) geologist who is permanently laid off from an oil company due to a new technological advance.
   C) worker at a fast-food restaurant who quits work and attends college.
   D) real estate agent who leaves a job in Texas and searches for a similar, higher-paying job in California.

Use the following to answer question 16:

16. (Figure: Loanable Funds) The accompanying graph shows the market for loanable funds in equilibrium. Which of the following might produce a new equilibrium interest rate of 8% and a new equilibrium quantity of loanable funds of $150 billion?
   A) Consumers increase consumption as a fraction of disposable income.
   B) Businesses become more optimistic about the return on investment spending.
   C) The federal government has a budget surplus rather than a budget deficit.
   D) There is an increase in capital inflows from other nations.
17. An example of a government transfer is a(n):
   A) expenditure on an interstate highway.
   B) bequest from a deceased relative.
   C) Social Security payment.
   D) salary for a member of the armed forces.

18. An important source of changes of income inequality over the past decade is:
   A) The stock market crash of 2008-09
   B) Loss of jobs by corporate executives indicted for their role in the financial crisis
   C) Loss of jobs by middle-income clerical workers and unionized manufacturing workers
   D) Reduction in the unemployment rate from 10% in late 2009 to 7% in November 2013.

19. The wealth effect is reflected in:
   A) increases in interest rate to savers.
   B) the upward slope in aggregate supply.
   C) the upward slope in aggregate demand.
   D) the downward slope in aggregate demand.

20. An increase in the demand for money would result from:
   A) a decrease in nominal GDP.
   B) a decrease in real GDP.
   C) a decrease in the price level.
   D) an increase in the price level.

Use the following to answer questions 21-22:

**Scenario: Aggregate Consumption Equation**

Suppose that the aggregate consumption function is given by the equation: \( C = 200 + 0.8YD \), where \( C \) represents consumption and \( YD \) represents disposable income.

21. (Scenario: Aggregate Consumption Equation) If disposable income is $500, aggregate consumption is:
   A) $0.
   B) $200.
   C) $400.
   D) $600.

22. (Scenario: Aggregate Consumption Equation) If disposable income is $500, autonomous consumption is:
   A) $0.
   B) $200.
   C) $400.
   D) $600.
23. During the four years between late 2009 and late 2013, the unemployment rate in the US fell from 10.0 to 7.0 percent, despite the fact that real GDP only grew by 2 percent per year during that 4 year period. What were the reasons cited in lecture for this paradox?
   A) falling labor-force participation rate, slower productivity growth
   B) rising labor-force participation rate, slower productivity growth
   C) falling labor-force participation rate, faster productivity growth
   D) rising labor-force participation rate, faster productivity growth

24. When an economy’s overall production grows faster than its population, it is referred to as:
   A) long-run growth per capita.
   B) an increase in nominal GDP.
   C) deflation.
   D) the paradox of thrift.

25. Deviations from the natural rate of unemployment are known as:
   A) frictional unemployment.
   B) structural unemployment.
   C) random unemployment.
   D) cyclical unemployment.

26. Anticipated inflation affects:
   A) borrowers only.
   B) lenders only.
   C) all aspects of the economy.
   D) only business firms involved in investment spending.

27. A fact reported in a course packet reading suggested that 90 percent of new mortgages go to borrowers with high credit scores. The lecture interpreted this as suggesting
   A) A low impact of interest rates on consumption
   B) A low impact of interest rates on investment
   C) A decline in the wealth effect on consumption
   D) A decline in the wealth effect on investment

28. When countries replaced gold and silver coins with paper money exchangeable for certain amounts of precious metals, the monetary system evolved from:
   A) using commodity money to using fiat money.
   B) using commodity-backed money to using fiat money.
   C) using commodity money to using commodity-backed money.
   D) using fiat money to using commodity-backed money.

Use the following to answer questions 29-32:

**Scenario: Real GDP**

Suppose that in year 1 an economy produces 100 golf balls that sell for $3 each and 75 pizzas that sell for $8 each. The next year the economy produces 110 golf balls that sell for $3.25 each and 80 pizzas that sell for $9 each.
29. (Scenario: Real GDP) The growth rate of nominal GDP from year 1 to year 2 is (use the In formula):
   A) 10%.
   B) 7.8%.
   C) 18%.
   D) 8.8%.

30. (Scenario: Real GDP) Using year 1 as the base year, real GDP in year 2 is:
   A) $900.
   B) $970.
   C) $1,000.
   D) $1,077.50.

31. (Scenario: Real GDP) The value of nominal GDP in years 1 and 2 respectively is:
   A) $900; $1,077.50.
   B) $900; $990.
   C) $180,000; $257,400.
   D) $1,000; $1,005.

32. (Scenario: Real GDP) Using year 1 as the base year, the growth rate of real GDP from year 1 to Year 2 is (use the ln formula):
   A) 10%.
   B) 7.5%.
   C) 19.7%.
   D) 8.8%.

33. Quality of life indicators supplement international comparisons of real GDP per capita. For France and Germany real GDP per capita is about 72% of the US level. In quality of life indicators France and Germany rate ______________ than 72% of the US level because of ______________.
   A) lower; higher inequality and lower life expectancy
   B) higher; higher inequality and higher life expectancy
   C) higher; lower inequality and higher life expectancy
   D) lower; lower inequality and lower life expectancy

34. The money supply curve is:
   A) downward sloping.
   B) vertical.
   C) upward rising.
   D) horizontal.

35. According to the wealth effect, when prices decrease, the purchasing power of assets:
   A) decreases and consumption decreases.
   B) increases and consumption decreases.
   C) decreases and consumption increases.
   D) increases and consumption increases.
36. Changes in aggregate demand can be caused by changes in:
   A) wages.
   B) business costs.
   C) raw materials costs.
   D) government spending.

37. Which of the following do economists view as investment spending?
   A) stocks
   B) bonds
   C) spending on physical capital
   D) mutual fund investing

38. The term "consumer deleveraging" refers to
   A) households adding debts in order to make consumption purchases
   B) households paying off debts and reducing their consumption purchases
   C) the Federal Reserve selling mortgage-backed securities in 2010-2013
   D) the Federal Reserve buying mortgage-backed securities in 2010-2013

39. Suppose that the economy is in long-run macroeconomic equilibrium and aggregate demand increases. As the economy moves to short-run macroeconomic equilibrium, there is:
   A) a recessionary gap with high inflation.
   B) a recessionary gap with low inflation.
   C) an inflationary gap with high unemployment.
   D) an inflationary gap with low unemployment.

40. Which of the following does NOT cause the money demand curve to shift?
   A) a change in the interest rate
   B) a change in the price level
   C) a change in banking technology
   D) a change in real GDP

41. The invention of ATMs reduced the:
   A) menu costs of inflation.
   B) shoe-leather costs of inflation.
   C) unit-of-account costs of inflation.
   D) seignorage.

42. Which of the following assets is the MOST liquid?
   A) a $50 bill
   B) a $50 Amazon.com gift certificate
   C) 100 shares of Microsoft stock
   D) an economics textbook
43. Enchante Inc., a designer clothing company, buys $400 worth of silk from a silk trader and $30 worth of accessories from AccessoriesRuS to produce each dress. If the value added by Enchante is equal to $200, then according to the value-added approach, the price of the designer dress should be:
   A) $630.
   B) $230.
   C) $200.
   D) $830.

44. People forgo interest and hold money:
   A) because they are required to.
   B) to reduce their transactions costs.
   C) because there are no substitutes for money.
   D) because banks are too risky.

45. Many Silicon valley entrepreneurs, including the late Steve Jobs, the current CEO of Apple Tim Cook, and the famous Mark Zuckerberg all endorse raising the quote of H1B visas for foreign nationals who complete degrees in the US in science, math, and engineering. We learned in lecture that this would do the following to the ratio of skilled to unskilled wages and employment.
   A) Raise the relative wage ratio and leave relative employment unchanged
   B) Raise the relative wage ratio and reduce relative skilled to unskilled employment
   C) Reduce the relative wage ratio and raise relative skilled to unskilled employment
   D) Reduce the relative wage ratio and leave relative employment unchanged.

46. A business will want to borrow to undertake an investment project when the rate of return on that project is:
   A) lower than the interest rate.
   B) higher than the interest rate.
   C) higher than the exchange rate.
   D) equal to the inflation rate.

47. The trough of the business cycle:
   A) comes right after the expansion phase.
   B) comes before the recession phase.
   C) is a temporary maximum level of real GDP.
   D) is a temporary minimum level of real GDP.

48. All of the following are examples of bank regulations designed to prevent bank runs EXCEPT:
   A) reserve requirements.
   B) deposit insurance.
   C) the federal funds rate.
   D) capital requirements.

49. The short-run aggregate supply curve slopes upward because of:
   A) wage and price stickiness.
   B) wage and price flexibility.
   C) increasing technology.
   D) a reduction in resource availability at higher price levels.
50. In a simple closed economy, all investment spending must come from:
   A) saving.
   B) money creation.
   C) debt issuance.
   D) foreign borrowing.

51. Changing the level of government spending is an example of:
   A) fiscal policy.
   B) interest rate policy.
   C) monetary policy.
   D) exchange rate policy.

52. An important part of Ben Bernanke’s “quantitative easing” policy is
   A) Buying government bonds
   B) Buying mortgage backed securities
   C) Selling government bonds
   D) Selling mortgage-backed securities
   E) A) and B)
   F) C) and D)

Use the following to answer questions 53-54:

![Figure: Productivity]

53. (Figure: Productivity) An increase in physical capital per worker with everything else remaining unchanged is shown on the diagram as:
   A) a movement from B to C.
   B) a movement from A to C.
   C) a movement from A to B.
   D) a movement from B to A.
54. (Figure: Productivity) An improvement in technology with everything else remaining unchanged is shown on the diagram as:
   A) a movement from B to A.
   B) a movement from A to B.
   C) a movement from B to C.
   D) a movement from A to C.

55. The skills, training, and education possessed by workers that contribute to economic growth are known as:
   A) saving.
   B) human capital.
   C) natural resources.
   D) output of labor.

56. Alice's disposable income increases by $1,000, and she spends $600 of it. Alice's:
   A) MPS is 0.4 and she saves $400.
   B) MPC is 0.4 and she saves $400.
   C) MPS is 0.4 and she saves $600.
   D) MPC is 0.6 and she consumes $400.

57. If a country sold more goods and services to the rest of the world than it purchased from the other countries, then the country has a:
   A) trade deficit.
   B) budget deficit.
   C) trade surplus.
   D) budget surplus.

58. A source of the leftward shift in the Aggregate Demand curve in the Great Depression of 1929-33 as discussed in lecture was
   A) The decline in defense spending after the end of World War I
   B) Overbuilding in the 1920s due partly to the invention of the electric elevator
   C) Fear of an imminent war after Hitler took over political control of Germany
   D) An increase in imported goods which created unemployment for workers employed in the industries making the same kinds of products as the new imports

59. The present value of a future payment:
   A) decreases when the interest rate rises.
   B) decreases when the interest rate falls.
   C) decreases when the interest rate stays the same.
   D) never changes regardless of the interest rates.

60. Suppose the marginal propensity to consume changes from 0.75 to 0.9. How will this affect the consumption function?
   A) The slope will get steeper.
   B) Autonomous consumption will increase.
   C) The function will shift upward.
   D) The slope will get steeper and autonomous consumption will increase.
### PART B – SHORT ANSWER QUESTIONS

**Problem 1** (13 pts)

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<th>Have a part time job</th>
<th>Don't have a job but are looking for one</th>
<th>Don't have a job and are not looking for one</th>
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a) [1 pt] What is the size of the labor force in this economy?

b) [1 pt] Calculate the Labor Force Participation Rate for this economy. *Report as a percentage to two decimal places.*

c) [1 pt] Calculate the Unemployment Rate for this economy. *Report as a percentage to two decimal places.*
d) [1 pt] Calculate the Employment Population Ratio for this economy. Report as a percentage to two decimal places.


e) [1 pt] What is the Unemployment Rate for people aged 21-50? Report as a percentage to two decimal places.

f) [8 pts] For this part, assume that nothing changed with respect to the population, i.e., those who were working kept their jobs and those who were looking for jobs kept looking for jobs. Choose between (increase/decrease/not change)
   
A) A baby is born.
   i) Unemployment Rate will ________________
   ii) Labor Force Participation Rate will ________________
   iii) Employment-Population Ratio will ________________

B) John, 35 years old, was discouraged by the poor job opportunities, so he was not working and not looking for a job. One day, his cousin called him offering a job which he took.
   i) Unemployment Rate will ________________
   ii) Labor Force Participation Rate will ________________
   iii) Employment-Population Ratio will ________________

C) After 50 years of hard work, Mark, 70 years old, retires.
   i) Unemployment Rate will ________________
   ii) Labor Force Participation Rate will ________________
Problem 2 (10 pts)

Consider Country X with a GDP level of 210,000 and a growth rate of 5% in 2013 (calculated at the end of year 2013). The experts predict that the growth of the economy of Country X will gradually slow down in the coming years. More precisely, they foresee the following growth rates for the future:

- 2013 – 2016 5%
- 2016 – 2019 3%
- 2019 – on 1%

Hint: The list above should be read as saying that, for instance, `the growth rate from the end of 2013 until the end of 2016 will be 5%, then from the end of 2016 until the end of 2019 it will be 3%` and so on.

a) [5 pts] Assuming that the predictions of the experts listed above are accurate, when in the future will Country X's GDP double compared to the GDP level of 2013?

b) [3 pts] What would your answer for the question in part a be if the growth rate from 2019 and on was in fact -1%? Explain your reasoning carefully.
c) [2 pts] Consider now the more optimistic scenario in which the economy does not slow down and the current growth rate of 5% remains constant in the coming years. How long will it take for the GDP level to double in this scenario? Express your answer in two forms: i) in number of years, ii) as a fraction of your answer in part a.
Problem 3 (10 pts)

You have the following information on 3 countries: Soccerland, Handeggland and Neverland

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<th>Handeggland</th>
<th>Neverland</th>
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<td>GDP in the beginning of 2013</td>
<td>5000</td>
<td>1000</td>
<td>2000</td>
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<tr>
<td>Growth rate per year</td>
<td>5%</td>
<td>8%</td>
<td>10%</td>
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a) [1 pt] How long will it take until Soccerland’s GDP increases by 75%?

b) [2 pts] How long will it take until Soccerland and Handeggland have the same GDP?

c) [2 pts] Soccerland’s population is not happy that, eventually, Handeggland is going to have higher GDP than their country. They feel that they are a much better country, so they are going to work harder to ensure that Handeggland will never catch up with Soccerland. If Soccerland new growth rate is constant every year, what is the minimum growth rate that ensures that Soccerland will always have a higher GDP than Handeggland?
d) [5 pts] Neverland’s ambition is to host the World Cup. At the beginning of 2013, its GDP was 2,000 and it was growing at 10% a year. Moreover, it will keep this pace until it hosts the World Cup. In order to host such a big event, Neverland’s GDP must be at least 6,000. After the moment it reaches that GDP level, it will host the World Cup in the beginning of the next year available for the event (remember that the World Cup takes place every four years, in the years: 2014, 2018, 2022, etc.) During the year that Neverland hosts the World Cup, their GDP will grow at 75%. Then, everything returns to normal, and their GDP will keep growing at 10% a year forever onwards.

i) (3 pts) When will Neverland’s GDP reach 20,000?

ii) (2 pts) Suppose the Federation no longer requires Neverland to have a minimum GDP of 6,000 in order to host the World Cup, and instead it lets Neverland host the World Cup in 2014. How does your answer compare to part i), i.e., would Neverland be able to attain a GDP of 20,000 earlier, later or at the same time as in part i)?
Problem 4 (15 pts)

You are given data on the following variables in an economy:

- Government spending: 300
- Planned investment: 200
- Net exports: 50
- Autonomous taxes: 250
- Income tax rate: 0.1
- Marginal propensity to consume: 0.5

a) [2 pts] Consumption (C) is 600 when income (Y) is equal to 1500. Solve for autonomous consumption.

b) [4 pts] Solve for the equilibrium level of output in the following two scenarios: i) there is an income tax t=0.1, ii) there is no income tax in the economy. Denote these two variables by $Y^*_w$ and $Y^*_{wo}$ respectively.

c) [2 pts] In the economy with an income tax of 10%, what is the budget balance of the government?
d) [3 pts] Solve for the change in net exports that would bring the equilibrium output level in the economy with the income tax to the level of $Y^*_{wo}$ that you found in part b. Specify both the magnitude of the change and whether it is an increase or a decrease. What would be the new level of net exports after this change?

e) [4 pts] Suppose that we would like to achieve the same goal (as in part d) by changing the level of autonomous taxes instead of that of net exports. So, net exports remain at 50 and the level of autonomous taxes changes instead. Find the necessary magnitude of the change and specify whether autonomous taxes would have to increase or decrease. What would be the new level of autonomous taxes that accomplishes this goal?
**Problem 5 (12 pts)**

You are given the following information:

- Bank deposits (D) 350
- Currency-to-deposits ratio (c) 0.20
- Required reserve ratio (rr) 0.15

a) [2 pts] Solve for the monetary base level (B) in this economy.

b) [2 pts] Solve for the level of bank reserves (R) in this economy.

c) [2 pts] Solve for the money supply level (M) in this economy.

d) [3 pts] Suppose there is a sudden rise in the currency-to-deposits ratio, from the original level of 0.2 to a new level of 0.4. If everything else remains unchanged, find the level of monetary base needed to keep money supply fixed at the level you solved for in part c.

e) [3 pts] Continue to consider c=0.4. Find the level of required reserve ratio needed to keep the monetary base and the money supply fixed at the level you solved or in parts a and c, respectively.
Answer key:

1. B
2. A
3. B
4. D
5. D
6. C
7. C
8. C
9. B
10. A
11. A
12. A
13. B
14. A
15. D
16. B
17. C
18. C
19. D
20. D
21. D
22. B
23. A
24. A
25. D
26. C
27. B
28. C
29. C
30. B
31. A
32. B
33. C
34. B
35. D
36. D
37. C
38. B
39. D
40. A
41. B
42. A
43. A
44. B
Problem 1
a) 1125
b) 74.26%
c) 29.78%
d) 52.15%
e) 24.24%
f) A – not change, not change, not change
   B – decrease, increase, increase
   C – increase, decrease

Problem 2
a) the GDP will double in year 2065; it will take 51.31 years.
b) never
c) it will take 13.86 years. As a fraction, $13.86/51.31 = 0.27$ so $27/100$ of the time it took in part a.

Problem 3
a) 11.19 years
b) 53.65 years
c) 8%
d) i) 2029
   ii) Same time

Problem 4
a) 50
b) $Y^*_{w} = 863.64 \quad Y^*_{w_0} = 950$
c) $T = 336.36$, surplus of 36.36
d) 47.5, increase, 97.5
e) 95, decrease, 155

Problem 5
a) 122.5
b) 52.5

c) 420

d) 165

e) 0.0083333...