ECON 1010 Principles of Macroeconomics

Solutions to the Final Exam

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Your Name _____

Section 1: Multiple Choice (100 pts). Circle the correct answer; each is worth 2.5 points.

1. Opportunity cost is:

   A) about half of the monetary cost of a product.
   B) the dollar payment for a product.
   C) the benefit derived from a product.
   D) the value of the best alternative forgone in making any choice.

2. We have to make choices because:

   A) we have unlimited income.
   B) resources are scarce.
   C) resources are infinite.
   D) with good planning, trade-offs can be avoided.

3. All points inside the production possibility frontier represent:

   A) efficient production points.
   B) inefficient production points.
   C) infeasible production points.
   D) economic growth.

Table: Trade-off of Study Time and Leisure Time

Quantity of Hours of Study Time	Quantity of Hours of Leisure Time
16	0
12	4
8	8
4	12
0	16

4. Examine the table above. A student sleeps 8 hours per day and divides the remaining time between study time and leisure time. The table shows the combinations of study and leisure time that can be produced in the 16 waking hours of each day. If a student decides to consume one additional hour of leisure time, how many hours of study time must be given up?

   A) 4
   B) 0.25
   C) 1
   D) 16

Table: Coffee and Salmon Production Possibilities

	Coffee	Salmon
Brazil	40	20
Alaska	10	10

5. The table above shows the maximum amounts of coffee and salmon that Brazil and Alaska can produce if they just produce one good. The opportunity cost of producing 1 unit of coffee for Brazil is:

   A) 2 salmon.
   B) 1/4 salmon.
   C) 1 salmon.
   D) 1/2 salmon.

6. The table above shows the maximum amounts of coffee and salmon that Brazil and Alaska can produce if they just produce one good. Which of the statements is TRUE?

   A) Brazil has an absolute advantage in producing both coffee and salmon.
   B) Brazil has a comparative advantage in producing salmon.
   C) Alaska has an absolute advantage in producing coffee only.
   D) Alaska has a comparative advantage in producing coffee.

7. Which example illustrates the law of demand?

   A) An increase in tuition encourages more students to enroll in college because the quality of education has risen.
   B) Consumers buy more personal computers because prices have fallen.
   C) Oil companies drill for new sources of oil because oil prices are higher.
   D) Fewer people play golf because incomes are lower.

8. A technological advance in the production of automobiles will:

   A) increase the demand for automobiles.
   B) increase the supply of automobiles.
   C) decrease the demand for automobiles.
   D) decrease the supply of automobiles.

9. The price of microchips used to produce computers falls. As a result, the equilibrium price of computers _____ and the equilibrium quantity _____.

    A) rises; increases
    B) rises; decreases
    C) falls; decreases
    D) falls; increases

10. A binding price ceiling is designed to:

    A) keep prices below the equilibrium level.
    B) increase the quality of the good.
    C) prevent shortages.
    D) increase efficiency.

Table: The Market for Soda

Price ($/unit)	Market for a Can of Soda	
	Quantity Demanded (cans)	Quantity Supplied (cans)
0.50	10	7
0.75	8	8
1.00	6	9
1.25	4	10
1.50	2	11

11. If the government imposes a price ceiling of $0.50 per can of soda, the quantity of soda demanded will be:

    A) 10 cans.
    B) 8 cans.
    C) 6 cans.
    D) 4 cans.

12. The short-run alternation between economic downturns and recessions, then economic upturns and expansions is known as the:

    A) business cycle.
    B) contractionary cycle.
    C) expansionary cycle.
    D) disequilibrium cycle.

13. In the circular-flow model, households:

    A) receive transfer payments from the government.
    B) buy resources in the factor markets.
    C) sell products in the market for goods and services.
    D) issue stocks and bonds to raise capital.

14. Gross domestic product is the total value of all:

    A) physical capital used in the production process.
    B) production activity accomplished within households.
    C) final goods and services produced in the economy in the period of a year.
    D) goods produced domestically that are exported.

15. If both aggregate output and the aggregate price level increase:

    A) real GDP will increase faster than nominal GDP.
    B) nominal GDP will increase faster than real GDP.
    C) it makes no difference to real or nominal GDP.
    D) real GDP and nominal GDP will increase faster than the price level.

Unemployment and Employment Data (in millions)	
Population	170
Employed	95
Unemployed and looking for work	5
Discouraged workers	3
Retired	30

16. According to the table above, the unemployment rate for this economy is:

    A) 2.9%.
    B) 4.8%.
    C) 5%.
    D) 5.3%.

17. According to the table above, the labor force in this economy is:

    A) 170 million.
    B) 140 million.
    C) 100 million.
    D) 98 million.

18. A binding minimum wage in a labor market is set _____ the equilibrium wage and creates a _____ of labor.

   A) below; surplus
   B) below; shortage
   C) above; surplus
   D) above; shortage

Table: The Consumer Price Index (CPI)

February, 2009	212.2
February, 2010	216.7
February, 2011	221.6
February, 2012	224.6

19. According to the table above, the inflation rate between 2011 and 2012 is:

   A) 10%.
   B) 3%.
   C) 1.4%.
   D) 24.6%.

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20. Inflation is a(n):

   A) rising aggregate price level.
   B) expansion of output.
   C) rise in wages.
   D) rise in the unemployment rate.

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21. The standard of living in a country can be best measured by:

   A) nominal GDP per capita.
   B) real GDP per capita.
   C) the productivity growth rate.
   D) the business cycles.

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22. Technological progress is best measured by:

   A) physical capital per worker.
   B) human capital per worker.
   C) population growth.
   D) total factor productivity.

GDP
per worker

Physical capital per worker
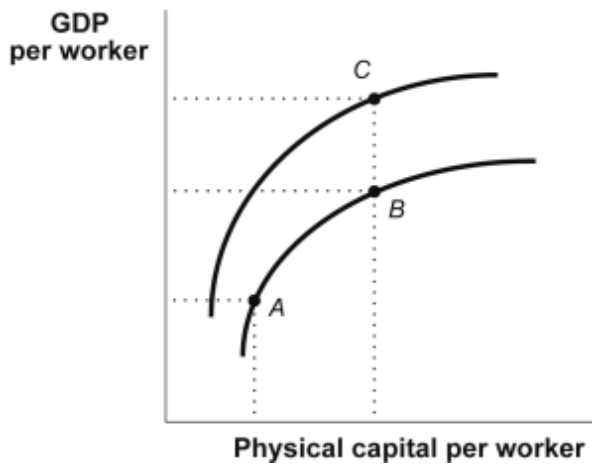
23. An improvement in technology with everything else remaining unchanged is shown on the figure as a movement from:

A) *B* to *A*.
B) *A* to *B*.
C) *B* to *C*.
D) *A* to *C*.

24. GDP is $12 trillion this year in a closed economy. Consumption is $8 trillion and government spending is $2 trillion. Taxes are $0.5 trillion. How much is private saving?

A) $4 trillion
B) $2.5 trillion
C) $3.5 trillion
D) –$0.5 trillion

25. Using the numbers in Question #24, what is the government budget balance?

A) a surplus of $1.5 trillion
B) a deficit of $1.5 trillion
C) a surplus of $0.5 trillion
D) a deficit of $0.5 trillion

26. There is a _____ relationship between the amount of loanable funds demanded and the rate of interest.

A) positive
B) direct
C) negative
D) both negative and positive

27. Val wins a prize at her sorority, and she is given the following two payoff options: Option 1 is to receive $100 one year from today and $100 two years from today. Option 2 is to receive $180 today. If the annual interest rate is 10%, the present value of option 1 is:
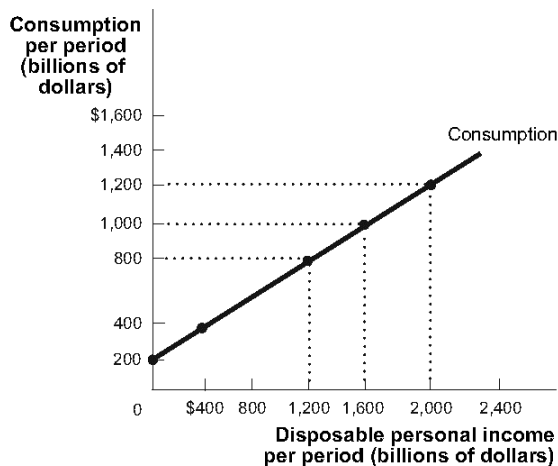
A) $173.56.
B) $190.91.
C) $182.65.
D) $181.80.

28. If the marginal propensity to save (*MPS*) = 0.1, then the value of the multiplier equals:

A) 1.
B) 5.
C) 9.
D) 10.

29. Suppose investment spending increases by $50 billion and as a result the equilibrium income increases by $200 billion. The investment multiplier is:

A) 8.
B) 10.
C) 4.
D) 0.25.

30. According to the figure above, the slope of the consumption function is:

A) 0.25.
B) 0.50.
C) 0.60.
D) 0.67.

31. If GDP is smaller than planned aggregate spending, then:

   A) unplanned inventory investment is positive.
   B) GDP will fall.
   C) the economy is in equilibrium.
   D) unplanned inventory investment is negative.

32. If the price level rises by 10%, the purchasing power of $10,000 would:

   A) increase to $11,000.
   B) decrease to $9,000.
   C) decrease to $1,000.
   D) remain constant.

33. A decrease in energy prices will:

   A) increase short-run aggregate supply.
   B) decrease the quantity of aggregate output supplied in the short run.
   C) decrease aggregate demand.
   D) increase the quantity of aggregate output demanded.

34. A positive demand shock will:

   A) increase the aggregate price level and aggregate output.
   B) decrease the aggregate price level and increase aggregate output.
   C) increase the aggregate price level and decrease aggregate output.
   D) decrease both the aggregate price level and aggregate output.

35. If the *SRAS* curve intersects the aggregate demand curve to the right of *LRAS*,
   the result will be:

   A) a recessionary gap.
   B) an inflationary gap.
   C) cyclical unemployment.
   D) long-run equilibrium.

36. Which is NOT a method of fiscal policy?

   A) changing tax rates
   B) government transfers
   C) government purchases of goods and services
   D) changes in the money supply

37. Suppose the economy is in a recessionary gap. To move equilibrium aggregate output closer to the level of potential output, the best fiscal policy option is to:

   A) decrease government purchases.
   B) decrease taxes.
   C) decrease government transfers.
   D) increase real interest rates.

38. If the marginal propensity to consume is 0.80 and the federal government decreases spending by $200 billion, the income–expenditure model predicts that real GDP will fall by:

   A) $160 billion.
   B) $200 billion.
   C) $800 billion.
   D) $1,000 billion.

39. Which is considered to be money?

   A) Google stock
   B) bonds
   C) credit cards
   D) checking account deposits

40. The three main monetary policy tools are:

   A) interest rates, taxes, and government purchases.
   B) currency, near-moneys, and reserve ratio.
   C) deposit insurance, discount rate, and money multiplier.
   D) reserve requirements, the discount rate, and open-market purchases.

**Section B: Short Answer Questions. (100 points)**

#1. (20 pts) Economies A and B produce only two goods: Good X and Good Y. Given the same inputs, the two economies can produce a maximum output of each good according to the following table.

	Quantity of Good X	Quantity Good Y
Economy A	100	25
Economy B	150	75

a) (10 pts) Assuming constant opportunity costs, draw the production possibilities frontiers (PPF) for each of the two economies. Let the horizontal axis measure X and the vertical axis measure Y. What is the slope of each PPF and how does it relate to opportunity cost? Does either economy have an absolute advantage? Which economy has a comparative advantage in producing X and which in Y? Explain.

SOLUTIONS:

The slope of the PPF for Economy A is -1/4. The slope of the PPF for Economy B is -1/2. For Economy A, the opportunity cost of producing one more unit of Good X is giving up 1/4 units of Good Y. For Economy B, the opportunity cost of producing one more unit of Good X is giving up 1/2 units of Good Y. Economy B has an absolute advantage in Goods X and Y. Economy A has a comparative advantage in producing Good X because it gives up less of Good Y for each additional unit of Good X produced. Economy B has a comparative advantage in Good Y.
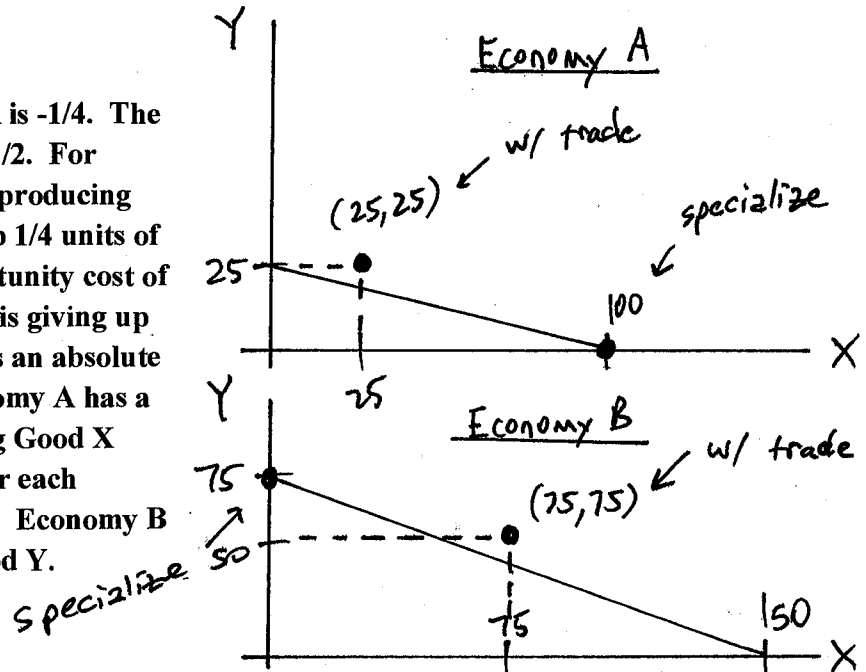
b) (10 pts) If each economy specializes in the good they have a comparative advantage in, determine a combination of output and trade for each country that allows both to consume outside of their PPF and show it graphically on your graph above.

SOLUTIONS:

Since Economy A has a comparative advantage in Good X, they will produce 100 X and no Y. Since Economy B has a comparative advantage in Good Y, they will produce no X and 75 Y. Then they trade. Assume Economy A keeps 25 X and trades 75 X to Economy B. Assume Economy B keeps 50 Y and trades 25 Y to Economy A. These combinations are plotted above. After trade, the consumption bundles lie outside the PPFs. This shows the mutually beneficial gains from trade.

#2. (20 pts) Consider the quantity of production and prices for a two-good economy as depicted in the table below. Assume for any calculations that the base year is 2016.

Year	Quantity Good X	Price per unit of X	Quantity Good Y	Price per unit of Y
2016	10	10	5	10
2017	10	8	10	15
2018	15	6	20	25

a) (10 pts) Calculate real GDP, nominal GDP and the GDP deflator for each of the three years in the table. What is the inflation rate in 2017 and 2018? What is the real GDP growth rate in 2017 and 2018?

SOLUTIONS:

Nominal GDP for year 2016, 2017 and 2018 are
$$GDP_{2016} = (10 \times \$10) + (5 \times \$10) = \$150$$
$$GDP_{2017} = (10 \times \$8) + (10 \times \$15) = \$230$$
$$GDP_{2018} = (15 \times \$6) + (20 \times \$25) = \$590$$

Real GDP for year 2015, 2016 and 2017 are
$$Real\ GDP_{2016} = (10 \times \$10) + (5 \times \$10) = \$150$$
$$Real\ GDP_{2017} = (10 \times \$10) + (10 \times \$10) = \$200$$
$$Real\ GDP_{2018} = (15 \times \$10) + (20 \times \$10) = \$350$$

The GDP deflator for year 2016, 2017 and 2018 are

$$\frac{\$150}{\$150} \times 100 = 100; \quad \frac{\$230}{\$200} \times 100 = 115; \quad and \quad \frac{\$590}{\$350} \times 100 = 169$$

The 2017 GDP deflator inflation rate is: $\frac{115-100}{100} \times 100 = 15.0\%$

The 2018 GDP deflator inflation rate is: $\frac{169-115}{115} \times 100 = 47.0\%$

The 2017 growth rate in real GDP is: $\frac{\$200-\$150}{\$150} \times 100 = 33.3\%$

The 2018 growth rate in real GDP is: $\frac{\$350-\$200}{\$200} \times 100 = 75.0\%$

b) (10 pts) How many years will it take the economy to double in size using the 2017 growth rate? Also, explain how inflation can be positive when good X is getting cheaper.

SOLTUIONS: Using the Rule of 70 (approximation) and 2017 growth rates, real GDP will double in $\frac{70}{33.3} = 2.1$ years. Rounding up to the next integer, it will take three years. Inflation is positive while X is getting cheaper because inflation is the percent increase in the <u>aggregate</u> price level. During periods of inflation, some goods may be getting cheaper but they will be offset by other goods that are getting more expensive.

#3. (30 pts) Keynesian Cross Model

a) (15 pts) Consider an economy where planned investment is 50, autonomous consumption is 20, government spending is 50, and the MPC is 0.8. The economy is closed and there are no taxes. Find the equilibrium level of real GDP (Y) and show the equilibrium using the graphical version of the income-expenditure (Keynesian Cross) model.

SOLUTIONS:

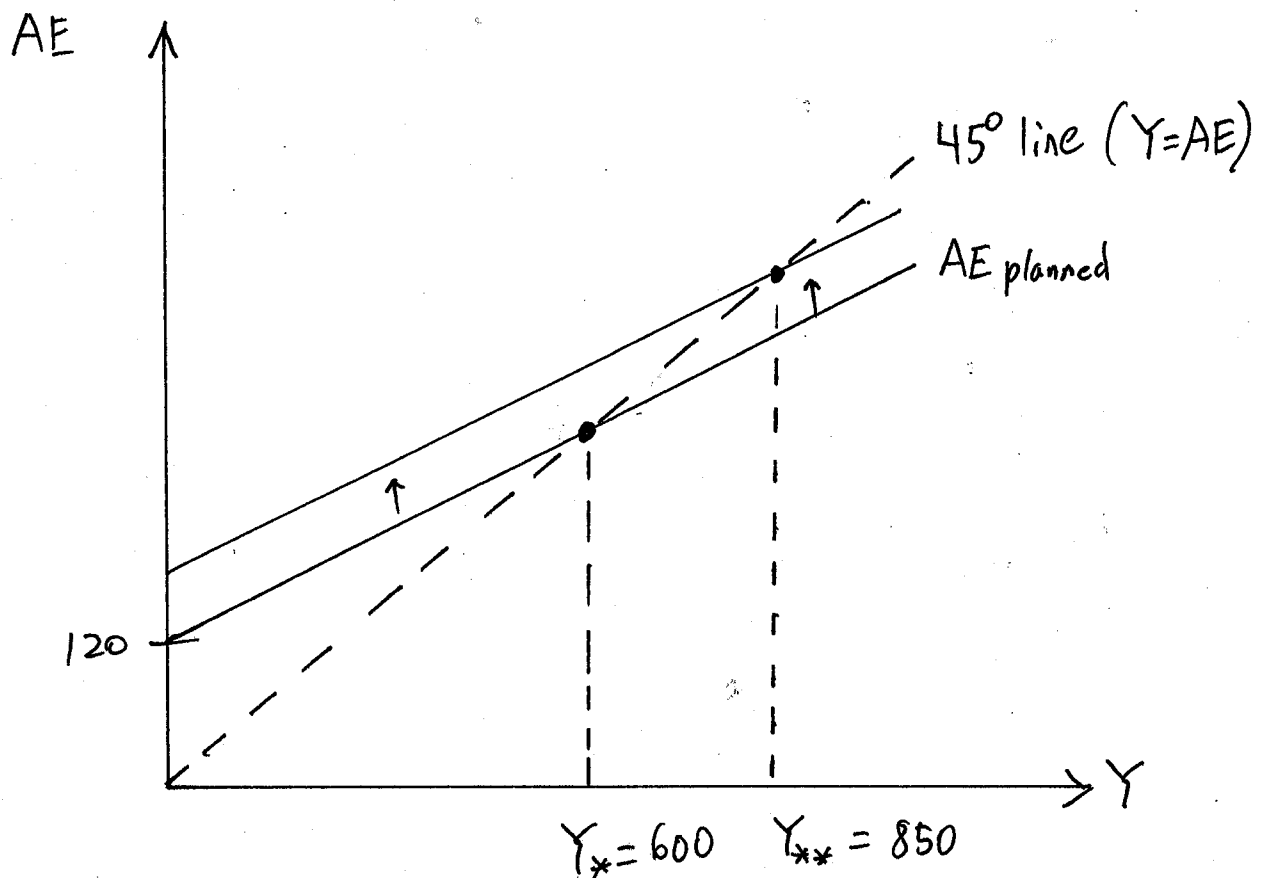**The equilibrium level of real GDP is equal to the planned aggregated spending.**

$$GDP(or\ Y) = AE_{Planned} = C + I_{Planned} + G$$
$$Y = 20 + 0.8 \times Y + 50 + 50$$

Substitute and solve for Y:

$$Y = 20 + 0.8 \times Y + 50 + 50$$
$$Y_* = 600$$

b) (15 pts) Assume the government doubles spending. Show the new equilibrium on your graph in part (a). Find the new equilibrium level of real GDP using the spending multiplier. Finally, calculate the size of the government budget deficit and explain how they are likely to pay for it.

SOLUTIONS:

Doubling government spending increases it from 50 to 100. The new equilibrium is
$$Y = 20 + 0.8 \times Y + 50 + 100$$
$$Y_* = 850$$
This makes sense given that the spending multiplier is $\frac{1}{1-MPC} = 5$. An increase of 50 in planned investment spending increases real GDP by 250.

The government will likely pay for its overspending (i.e., deficit) by issuing debt.

#4. (30 points) AD-SRAS-LRAS Model

The Trump administration is negotiating a trade deal with China that imposes tariffs on many goods imported from China. In response, China raises tariffs on U.S. goods. The trade war causes the U.S. stock market to fall sharply and businesses to decrease investment spending. Consumers also reduce household spending due to the decline in wealth.

Assume the economy starts in a long-run equilibrium; then use an AD-SRAS-LRAS model to show graphically the short-run and long-run transition of the economy from the China trade war. Label the initial equilibrium point A, the short-run equilibrium point B, and the long-run equilibrium point C. Explain the transition from points A to B to C in a short paragraph assuming two cases: (i) the trade war continues indefinitely; and (ii) the trade war ends quickly and spending returns to previous levels.

SOLUTIONS: The trade war will cause a reduction in household and business spending, shifting the AD curve to the left. The new AD curve intersects the SRAS at point B. In the short run, the economy will transition from point A to point B, such that real GDP and the price level fall. The economy is in a recession. If the trade war continues indefinitely, the recession will eventually cause nominal wages to fall. This will cause the SRAS curve to shift down and to the right until the economy eventually returns to a long-run equilibrium at point C. The long-run transition may be very slow, and the government could undertake expansionary fiscal or monetary policy to alleviate the recession. Alternatively, the trade war might end quickly, causing the AD curve to shift back to its original position and ending the recession.